

TRAILS

**Enabling Data Analytics for Actions
Tackling Skills Shortages & Mismatch**

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ACRONYMS

Acronym	Explanation
AES	ADULT EDUCATION SURVEY
CVT	CONTINUING VOCATIONAL TRAINING
CVTS	CONTINUING VOCATIONAL TRAINING SURVEY
IVT	INITIAL VOCATIONAL TRAINING
SMEs	SMALL AND MEDIUM SIZED ENTERPRISES

EXECUTIVE SUMMARY

D2.3, titled “Design of Interventions and Experimental Protocols”, outlines the framework for an experimental intervention to increase participation in education and training programs. This deliverable first analyses factors that outline participation rates in education and training programs along with factors that may influence participation rates at both individual and organizational levels, using data from the Adult Education Survey (AES) and Continuing Vocational Training Survey (CVTS). It identifies key barriers to participation—such as financial constraints, time limitations, and lack of institutional support—and examines disparities based on demographics, employment status, and income levels. Based on these insights, the deliverable proposes a nudge-based intervention designed to enhance engagement in training programs. The experimental design includes targeted behavioural interventions, engagement strategies for regional stakeholders in Tuscany (Italy), Catalonia (Spain), Borås Stad (Sweden), and Baden Württemberg (Germany), and a structured implementation plan to test the effectiveness of these measures. The findings will contribute to shaping future policies addressing skill development challenges across Europe.

1. INTRODUCTION

D2.3, presents the implementation steps of an experimental design aimed at increasing participation in education and training programs. Leveraging insights from the Adult Education Survey (AES) and the Continuing Vocational Training Survey (CVTS) and from the related literature about nudge-based policy interventions, the analysis aims to increase received guidance or seeking training-related information in individuals and increase their likelihood of participating in education and training. Results show that a considerable share of respondents—particularly older individuals and lower-income groups—report not feeling the need for further training, suggesting a potential gap in awareness regarding the benefits of skill development.

To address this challenge, the deliverable proposes a simplified personalized skills-level assessment combined with tailored training program recommendations as a key intervention. By providing individuals with clear, data-driven insights into their current skill levels and matching them with relevant training opportunities, this approach seeks to reduce misinformation and uncertainty about the value of upskilling. The empirical findings indicate that when individuals perceive training as relevant to their career prospects, they are more willing to participate. Therefore, this intervention aims to enhance guidance mechanisms and improve decision-making by ensuring individuals receive personalized learning pathways aligned with their professional needs.

The implementation will take place in four European regions: Tuscany (Italy), Catalonia (Spain), Borås Stad (Sweden), and Baden-Württemberg (Germany), where employment services and training providers will collaborate to deploy targeted guidance initiatives. The experiment will assess the effectiveness of personalized recommendations, proactive outreach, and streamlined enrolment processes in increasing participation rates. The deliverable, along with D3.4, aims to generate valuable insights to inform policies that improve access to lifelong learning, particularly among vulnerable groups such as the unemployed.

It should be noted that Task 2.3 also includes a stated preference experiment that has been already described in D2.2 (section 3 “Boost survey I: Conjoint analysis”).

1.1 PURPOSE OF THE DELIVERABLE

Deliverable D2.3 outlines the field experiment aimed at enhancing awareness and participation rates in education and training programs. It analyses the factors influencing participation rates at individual and firm levels across all European countries, utilizing data from the Adult Education Survey (AES) and the Continuing Vocational Training Survey (CVTS). This analysis offers valuable insights into driving factors that may influence future intentions to participate. The deliverable also describes the nudge intervention tool designed to increase participation rates taking into account the insights of the AES and CVTS surveys. Additionally, it includes a summary of the partners involved in various regions, such as employment and career guidance services, as well as education providers, ensuring that the experiment is tailored to regional needs and fostering greater

engagement among partners for successful implementation. Overall, deliverable D2.3 delineates the specifics necessary for the implementation phase of the experiment.

1.2 RELATION WITH OTHER DELIVERABLES AND TASKS

Deliverable D2.3 draws upon insights from Deliverables D1.1, titled “COMPARE I: Skills Mismatching in Europe Pre- and Post-Pandemic,” D1.2, “REVIEW II – Innovative Initiatives for Addressing Skills Shortages and Mismatches in Europe,” and D3.1, “COMPARE I: Skills Mismatching in Europe Pre- and Post-Pandemic.” It utilizes these inputs to inform D3.4, which focuses on “COMPARE IV: Behavioural, Social, and Cultural Change for Successful Development of Skills Aligned with Needs.” Specifically, D2.3 incorporates a comprehensive literature overview from D1.1 concerning skills mismatch, alongside the analysis in D1.2 that examines national and regional initiatives aimed at addressing this issue. Additionally, input from D3.1 highlights the impact of vocational training on wage levels and job satisfaction, which will be instrumental in shaping the final intervention. Ultimately, deliverable D2.3 will provide the architecture of the intervention, and the results will be presented in D3.4.

1.3 STRUCTURE OF THE DOCUMENT

The document is divided into two main sections. The first section, entitled “Background analysis of training participation”, examines the determinants of education and training participation at individual and firm levels. The second section, entitled “Experimental design”, presents the specifics of the nudge-based experiment, the participants of each region and the time plan of the intervention.

2. BACKGROUND ANALYSIS OF PARTICIPATION IN TRAINING

2.1 ANALYSIS OF THE AES SURVEY

2.1.1 THE DATA AND FREQUENCIES

While the AES dataset was described in deliverable 2.1, we have included pertinent input and text from that deliverable in this section for the reader's convenience, providing a quick overview of the AES dataset.

The pooled sample of the AES database used in the analysis encompasses 930,649 observations collected from 27 EU countries and 6 non-EU countries. The table below outlines the subsample for each country within the AES, including the number of observations and the corresponding percentage of the total sample across the four pooled AES waves.

More specifically, the first wave of the survey (2007 AES pilot survey—referred to as 2007 in the following sections) covers data from 26 countries with a net sample size of 200,895 individuals. **Table 1** reveals that countries are not equally represented in the sample, with Italy, Poland, Spain, France, and Romania having a larger number of observations and Latvia, Norway, Croatia, Denmark, and the Netherlands being underrepresented. All the national subsamples include individuals aged between 25 and 64 years.

The 2011 AES wave (referred to as 2011 in the following sections) contains data from 30 countries, with the national samples totalling 225,347 individuals. Poland, Spain, Portugal, France, and Romania rank among the countries with the largest representation, and Cyprus, Malta, Netherlands, Sweden, and Luxemburg rank among the countries with the fewer observations. Some countries include individuals aged under 25 or more than 64 in their samples, which are included in the following analysis.

The 2016 AES (referred to as 2016 in the following sections) is the third AES data collection, including data from 33 countries. The total net sample size is 239,762, with Spain, Poland, Romania, France, and Italy having the largest number of observations and Malta, Norway, Croatia, Sweden, and Finland having the fewest. Individuals aged under 25 or more than 64 are also included in some national samples and the following analysis.

The most recent AES data collection, 2022 AES (2022 in the following sections), has the largest net sample size compared to the other waves. Data from 30 countries were collected, totalling 264,645 individuals. Italy, Spain, Romania, France, and Switzerland are represented in the dataset with larger national subsamples, while Denmark, Bulgaria, Finland, Norway, and Croatia have smaller samples. The individuals included in the 2022 AES are aged more than 18 and less than 69 years.

Most EU countries have data coverage in all waves, while most non-EU countries (except Switzerland) do not. Turkey also participated in all AES waves, but its data could not be included in

the pooled dataset due to national authorities' restrictions on data dissemination. Malta's AES, Switzerland's 2007 AES, and Albania's 2016 AES data were also not included due to authorities' restrictions.

Table 1: AES- Sample size

COUNTRY	2007		2011		2016		2022	
	#Obs	(%)	#Obs	(%)	#Obs	(%)	#Obs	(%)
All Countries	200,895	100.0%	225,347	100.0%	239,762	100.0%	264,645	100.0%
Austria	4,675	2.3%	5,754	2.6%	5,620	2.3%	7,826	3.0%
Belgium	4,850	2.4%	5,526	2.5%	5,150	2.2%	8,274	3.1%
Bulgaria	5,263	2.6%	6,173	2.7%	6,530	2.7%	3,194	1.2%
Croatia	3,089	1.5%	0	0.0%	2,936	1.2%	3,542	1.3%
Cyprus	4,810	2.4%	2,404	1.1%	3,064	1.3%	6,891	2.6%
Czech Republic	9,543	4.8%	10,190	4.5%	12,272	5.1%	10,223	3.9%
Denmark	3,099	1.5%	3,660	1.6%	3,435	1.4%	2,448	0.9%
Estonia	3,585	1.8%	3,324	1.5%	3,838	1.6%	4,360	1.7%
Finland	4,144	2.1%	3,605	1.6%	3,001	1.3%	3,202	1.2%
France	15,350	7.6%	13,857	6.2%	14,953	6.2%	17,822	6.7%
Germany	6,407	3.2%	6,213	2.8%	7,750	3.2%	9,818	3.7%
Greece	6,510	3.2%	6,040	2.7%	5,469	2.3%	7,114	2.7%
Hungary	7,494	3.7%	7,367	3.3%	8,300	3.5%	6,734	2.5%
Ireland	0	0.0%	12,582	5.6%	4,863	2.0%	4,421	1.7%
Italy	27,848	13.9%	11,593	5.1%	14,844	6.2%	33,790	12.8%
Latvia	2,287	1.1%	5,048	2.2%	5,803	2.4%	5,492	2.1%
Lithuania	3,696	1.8%	5,388	2.4%	3,445	1.4%	5,004	1.9%
Luxembourg	0	0.0%	3,310	1.5%	4,072	1.7%	4,820	1.8%
Malta	0	0.0%	2,882	1.3%	1,963	0.8%	4,236	1.6%
Netherlands	3,326	1.7%	3,036	1.4%	3,092	1.3%	5,384	2.0%
Poland	24,817	12.4%	27,633	12.3%	18,094	7.6%	14,749	5.6%
Portugal	9,854	4.9%	14,189	6.3%	14,211	5.9%	14,064	5.3%
Romania	13,909	6.9%	13,651	6.1%	15,257	6.4%	19,979	7.6%
Slovakia	5,001	2.5%	5,000	2.2%	3,245	1.4%	4,380	1.7%
Slovenia	4,192	2.1%	4,943	2.2%	5,517	2.3%	4,890	1.9%
Spain	16,968	8.5%	17,829	7.9%	23,019	9.6%	22,162	8.4%
Sweden	3,632	1.8%	3,096	1.4%	2,976	1.2%	4,595	1.7%
Non-EU								
Bosnia Herzegovina	0	0.0%	0	0.0%	6,390	2.7%	0	0.0%
North Macedonia	0	0.0%	0	0.0%	7,601	3.2%	0	0.0%
Norway	3,018	1.5%	3,336	1.5%	2,723	1.1%	3,498	1.3%
Serbia	0	0.0%	4,534	2.0%	4,993	2.1%	5,372	2.0%
Switzerland	0	0.0%	9,660	4.3%	8,279	3.5%	16,361	6.2%
United Kingdom	3,528	1.8%	3,524	1.6%	7,057	2.9%	0	0.0%

Table 2 presents unweighted and weighted summary statistics for key variables in the pooled sample. The chosen variables were selected for their comparability across waves and their ability to provide a concise overview of central tendencies. Calculations were based on observations that reported valid values, with any instances of "not stated" or "not applicable" being excluded. The following analysis will focus on the weighted statistics as they are more representative of the population.

The weighted mean of males in the pooled sample suggests a nearly balanced gender distribution, with slightly fewer males than females. The weighted mean age is 44, indicating a skew toward middle age in the population. Almost half of the population resides in urban areas, with a significant proportion living in intermediate or thinly populated areas. Individuals' residence in the country mainly was over two years (95.8%).

Table 2: AES- Summary statistics of key variables

Variable	POOLED SAMPLE			
	UNWEIGHTED		WEIGHTED	
	#Obs.	Mean	#Obs.	Mean
Male	930,649	47.3%	930,649	49.7%
Age	930,649	44.7	930,649	43.9
Urbanisation: Densely-populated area	920,242	38.8%	920,242	44.9%
“-“-: Intermediate area	920,242	28.6%	920,242	30.1%
“-“-: Thinly-populated area	920,242	32.6%	920,242	25.0%
Duration of stay in the country: residence:	96,775	4.6%	96,755	4.3%
“-“-: 2-10 years	96,775	28.4%	96,775	30.6%
“-“-: > 10 years	96,775	67.0%	96,775	65.2%
Cohabiting/married	702,736	46.5%	702,736	46.7%
Household type: One-person household	722,683	13.7%	722,683	13.5%
“-“-: Lone parent with child(ren) aged<25	722,683	5.9%	722,683	5.0%
“-“-: Couple with child(ren) aged<25	722,683	33.4%	722,683	34.5%
Educational attainment level:	929,632	24.4%	929,632	24.3%
“-“-: Upper secondary	929,632	48.6%	929,632	48.0%
“-“-: Tertiary	929,632	27.0%	929,632	27.8%
Educational attainment level of the father:	783,397	52.4%	783,397	51.0%
“-“-: Upper secondary	783,397	34.6%	783,397	34.4%
“-“-: Tertiary	783,397	13.0%	783,397	14.6%
Educational attainment level of the mother: ≤Lower	799,274	58.0%	799,274	57.0%
“-“-: Upper secondary	799,274	31.5%	799,274	32.3%
“-“-: Tertiary	799,274	10.5%	799,274	10.8%
Employment status: Employed	922,739	62.7%	922,739	65.4%
“-“-: Unemployed	922,739	8.9%	922,739	8.5%
“-“-: Outside labour force	922,739	28.4%	922,739	26.0%
Full-time job	556,328	86.7%	556,328	83.0%
Income: Top 40%	617,529	41.3%	617,529	42.7%

A slightly more significant proportion live without a legal or de facto partner, and 34.5% of the population are couples with children aged less than 25 years. Educational attainment is relatively high, with the average individual completing upper secondary education. However, parental educational levels are generally lower, with a more significant proportion of fathers and mothers completing lower secondary education. Regarding employment status, 64.5% of the sample are employed, and 83% hold full-time positions. At last, 42.7% of the sample falls within the top 40% of income earners based on equivalized net current monthly household income. The income variable does not include data from AES2007 wave, as income on that wave was reported in grouped categories based on take-home pay from the main job.

Table 3: Weighted summary statistics of key variables by education/training status

Variable	FORMAL EDUCATION & TRAINING		NON-FORMAL EDUCATION & TRAINING		INFORMAL LEARNING	
	#Obs.	Mean	#Obs.	Mean	#Obs.	Mean
Male	90,935	46.7%	317,539	50.0%	400,121	49.9%
Age	90,935	29.4	317,539	41.5	400,121	42.8%
Urbanisation: Densely-populated area	88,774	54.4%	313,298	47.4%	392,613	45.5%
“-“-: Intermediate area	88,774	26.9%	313,298	31.0%	392,613	31.1%
“-“-:Thinly-populated area	88,774	18.8%	313,298	21.5%	392,613	23.5%
Duration of stay in the country:	10,400	8.5%	36,149	5.0%	48,235	5.4%
“-“-: 2-10 years	10,400	47.7%	36,149	33.0%	48,235	31.8%
“-“-: > 10 years	10,400	43.8%	36,149	62.0%	48,235	62.9%
Cohabiting/married	78,169	25.6%	256,492	48.4%	317,426	61.8%
Household type: One-person household	80,004	14.0%	260,501	14.1%	317,641	14.4%
“-“-: Lone parent with child(ren) aged<25	80,004	8.4%	260,501	5.2%	317,641	5.2%
“-“-: Couple with child(ren) aged<25	80,004	36.9%	260,501	39.2%	317,641	36.7%
Educational attainment level: ≤Lower	90,802	14.1%	317,178	12.6%	399,828	17.4%
“-“-: Upper secondary	90,802	50.5%	317,178	45.1%	399,828	46.3%
“-“-: Tertiary	90,802	35.4%	317,178	42.3%	399,828	36.3%
Educational attainment level of the	82,061	28.8%	273,180	39.9%	338,932	41.0%
“-“-: Upper secondary	82,061	42.0%	273,180	38.3%	338,932	39.0%
“-“-: Tertiary	82,061	29.2%	273,180	21.8%	338,932	20.0%
Educational attainment level of the	83,803	29.8%	279,217	45.7%	346,001	46.9%
“-“-: Upper secondary	83,803	42.5%	279,217	38.1%	346,001	37.8%
“-“-: Tertiary	83,803	27.7%	279,217	16.2%	346,001	15.3%
Employment status: Employed	90,490	44.8%	315,610	81.5%	399,744	69.0%
“-“-: Unemployed	90,490	6.9%	315,610	5.2%	399,744	7.8%
“-“-: Outside labour force	90,490	48.3%	315,610	13.3%	399,744	23.2%
Full-time job	36,624	78.6%	250,673	83.2%	256,183	83.3%
Income: Top 40%	66,436	38.8%	229,086	53.1%	288,825	46.7%

Table 3 presents weighted summary statistics of key variables by education and training status of responders aged 18 to 75. Participants in formal education and training tend to be significantly younger, averaging 29.4 years, compared to 41.5 years for non-formal learners and 42.8 years for informal learners. Furthermore, a higher proportion of formal education participants reside in densely populated areas (54.4%), which may indicate greater access to educational institutions.

In contrast, those engaged in non-formal education are more likely to be employed (81.5%) and to have higher income levels, with 53.1% falling within the top 40% income bracket. Notably, non-formal learners also exhibit the highest rate of tertiary education attainment at 42.3%, indicating that ongoing education is a common pursuit among individuals with higher educational backgrounds.

For informal learning, participants tend to be older, with a majority being cohabiting or married (61.8%) and more frequently employed (69.0%), albeit with slightly lower income levels than their non-formal counterparts. The nature of informal learning is characterized by its flexibility and self-directed approach, making it accessible across various demographic groups.

2.1.2 TRENDS IN PARTICIPATION RATES IN EDUCATION AND TRAINING

This section presents the participation rates in formal, non-formal and informal training. Formal education includes structured programs that lead to recognized qualifications, such as university degrees, vocational certifications, adult secondary education, and postgraduate studies. Non-formal education involves organized learning activities outside traditional institutions, typically without formal certification. This includes workplace training, professional development courses (e.g., leadership workshops, project management seminars), language classes, IT courses, MOOCs (like Coursera or edX), and corporate webinars. Informal learning is self-directed and unstructured, occurring through daily activities. Examples include learning new software by experimenting, watching YouTube tutorials, reading industry-related articles, listening to educational podcasts, or acquiring new skills through hobbies like photography or cooking.

Figure 1 below provides an overview of participation rates across all three types of education and training throughout the various waves of data collection. This analysis includes respondents aged 18 to 75. It is important to note that only 2007, 2016, and 2022 were considered for assessing participation rates in informal training programs, as the questions posed in AES2011 differed significantly from those in the other waves.

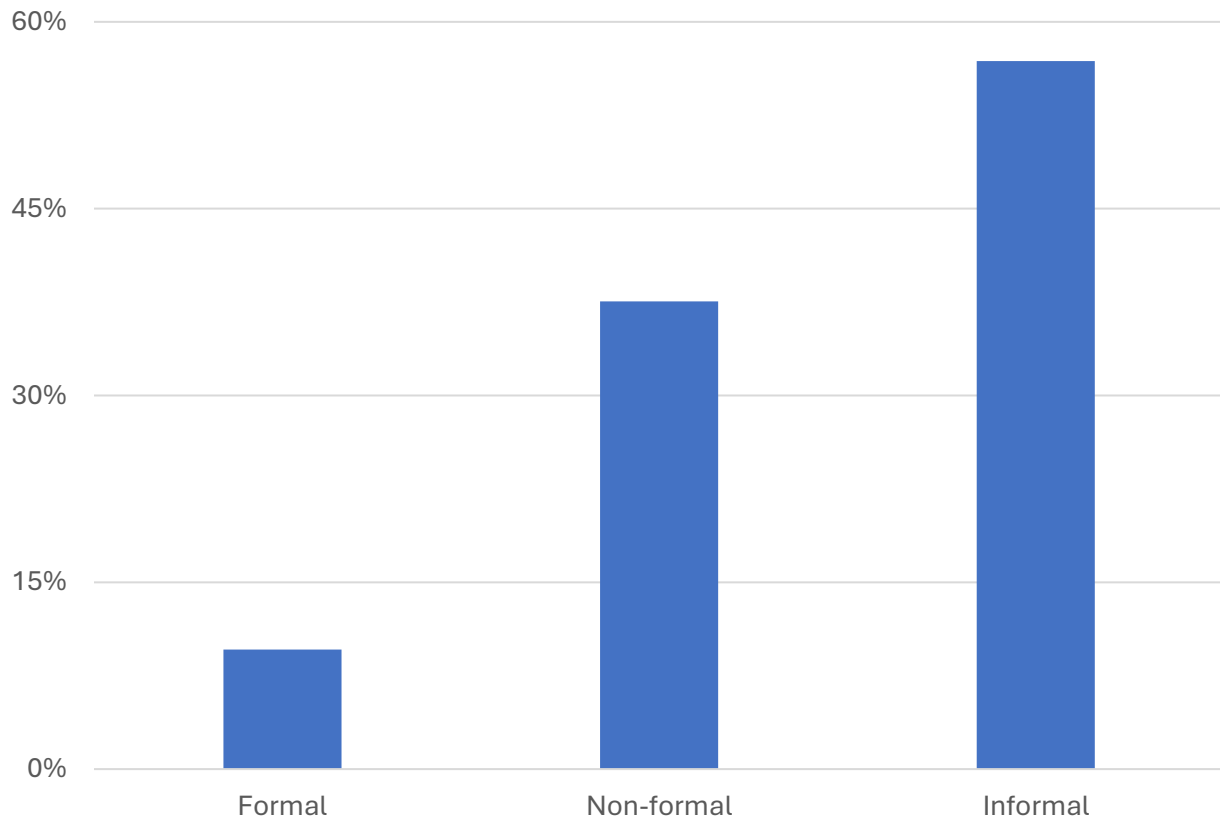


Figure 1. Participation rates in education and training types (weighted)

The data in **Table 4**, highlights significant variations in adult participation in formal education, non-formal education, and informal learning across European and non-EU countries. On average, 9.6% of adults participate in formal education, 37.6% in non-formal education, and 56.9% in informal learning. Sweden leads in formal (17.0%) and non-formal education (63.2%), reflecting its strong emphasis on lifelong learning. In comparison, Serbia shows the highest rate of informal learning (87.9%), indicating a cultural reliance on self-directed learning methods. In contrast, countries like Romania (10.0%) and Bosnia and Herzegovina (7.0%) report notably low participation in non-formal education, possibly due to limited access to organized training programs. Greece shows the lowest rate of informal learning (32.5%), suggesting potential gaps in self-directed learning opportunities or cultural differences in recognizing informal learning activities. The data reveals that while formal education rates remain relatively consistent, participation in non-formal and informal learning varies widely and is influenced by national education policies, cultural factors, and access to learning resources.

Table 4: Participation rate in education and training types by country (weighted)

COUNTRY	FORMAL EDUCATION&TRAINING	NON-FORMAL EDUCATION&TRAINING	INFORMAL LEARNING
All Countries	9.6%	37.6%	56.9%
Austria	8.1%	49.3%	76.3%
Belgium	10.3%	35.5%	47.2%
Bulgaria	6.8%	24.0%	42.1%
Croatia	5.7%	23.4%	69.1%
Cyprus	6.0%	41.5%	85.7%
Czech Republic	8.0%	36.7%	61.5%
Denmark	13.7%	44.7%	46.5%
Estonia	7.3%	42.9%	64.7%
Finland	14.3%	48.4%	66.4%
France	9.1%	46.5%	71.8%
Germany	8.8%	48.7%	55.8%
Greece	6.8%	13.3%	32.5%
Hungary	9.3%	37.5%	44.6%
Ireland	11.5%	39.9%	57.7%
Italy	6.1%	31.3%	62.5%
Latvia	5.9%	38.0%	65.8%
Lithuania	8.3%	26.8%	44.0%
Luxembourg	11.5%	50.2%	73.7%
Malta	8.4%	37.4%	48.0%
Netherlands	12.0%	54.4%	51.3%
Poland	10.2%	20.3%	35.5%
Portugal	11.4%	36.4%	67.0%
Romania	5.7%	10.0%	45.9%
Slovakia	9.7%	42.6%	76.4%
Slovenia	9.6%	36.8%	67.6%
Spain	12.7%	37.0%	48.7%
Sweden	17.0%	63.2%	76.0%
Non-EU			
Bosnia Herzegovina	2.4%	7.0%	74.8%
North Macedonia	4.0%	10.4%	67.3%
Norway	14.4%	53.4%	77.9%
Serbia	5.6%	16.9%	87.9%
Switzerland	11.5%	57.9%	44.4%
United Kingdom	13.8%	36.5%	59.7%

The data on participation rates in education and training types by wave (2007–2022) in **Table 5** reveals a clear upward trend across all forms of learning, reflecting the growing emphasis on lifelong learning in many countries. Formal education and training participation increased from 6.2% in 2007 to 12.3% in 2022, indicating a rising number of adults pursuing structured programs, possibly due to the increasing demand for higher qualifications in the job market. Non-formal education and training grew consistently, rising from 31.6% in 2007 to 41.7% in 2022, driven by expanding professional development courses, online training platforms, and workplace learning initiatives. The most significant growth is observed in informal learning, which jumped from 43.4% in 2007 to 64.6% in 2022. This sharp increase likely reflects the widespread availability of digital learning resources, such as online tutorials, podcasts, and self-directed learning tools, significantly accelerated by the shift to remote learning during the COVID-19 pandemic. Overall, the data highlights the evolving landscape of adult education, with a substantial shift towards more flexible and accessible learning opportunities.

Table 5: Participation rate in education and training types by wave (weighted)

TYPE	2007	2011	2016	2022
Formal education and training	6.2%	9.5%	9.9%	12.3%
Non-formal education and training	31.6%	35.5%	40.7%	41.7%
Informal learning	43.4%		60.6%	64.6%

2.1.2.1 DIFFERENCES IN PARTICIPATION RATES BY GENDER

Figure 2 shows the participation rates of males and females in formal, non-formal, and informal sectors from 2007 to 2022. Overall, participation has increased across all categories for both genders. While the gender gap is minimal, females consistently show slightly higher participation rates than males, particularly in formal and non-formal sectors. Informal participation rates are the highest for both genders, with a notable rise between 2016 and 2022. This trend highlights growing engagement, especially in informal activities, with relatively balanced gender representation over time. A detailed breakdown of the participation rates can be found on **Table 16** in the appendix.

2.1.2.2 DIFFERENCES IN PARTICIPATION RATES BY AGE (SENIORS vs YOUNG PEOPLE)

Respondents were divided into two groups based on their age at the time of the survey to facilitate analysis by age. Young adults (18-47) represent early and middle adulthood individuals. Seniors (48-75) include individuals approaching or beyond midlife. Notably, the term “Seniors” differs from those commonly used in international standards. For example, the United Nations defines older people as those aged 60 or 65 years or more, while the World Health Organisation (WHO) typically uses 65 years or above.

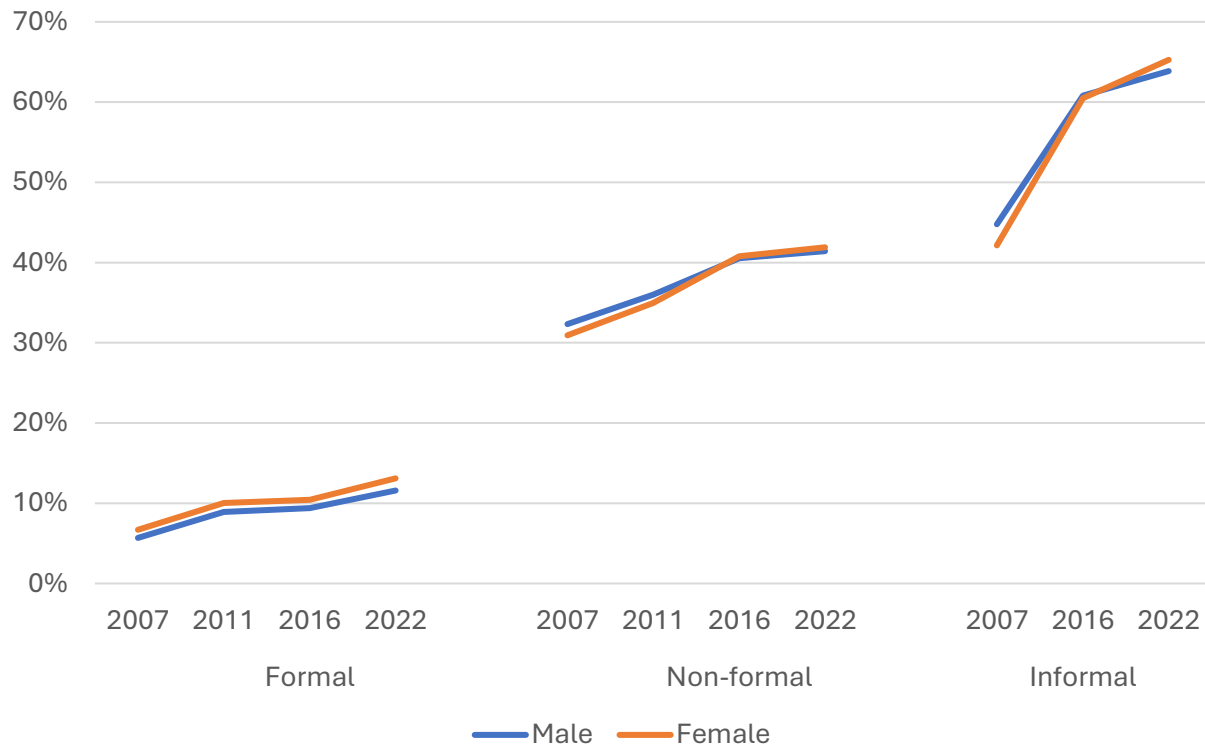


Figure 2. Participation rates in education and training types by gender and wave (weighted)

Figure 3 illustrates participation rates of seniors and young individuals in formal, non-formal, and informal sectors from 2007 to 2022. Young people consistently show higher participation rates across all categories, with significant growth over time, especially in informal activities where rates exceed 70% by 2022. In contrast, senior participation remains low in formal education, with almost no change over the years. However, there is a noticeable increase in senior involvement in non-formal and informal sectors, particularly after 2011. This highlights a growing trend of lifelong learning among seniors, though the gap with younger participants remains substantial. The participation rates are detailed in **Table 17**, located in the appendix.

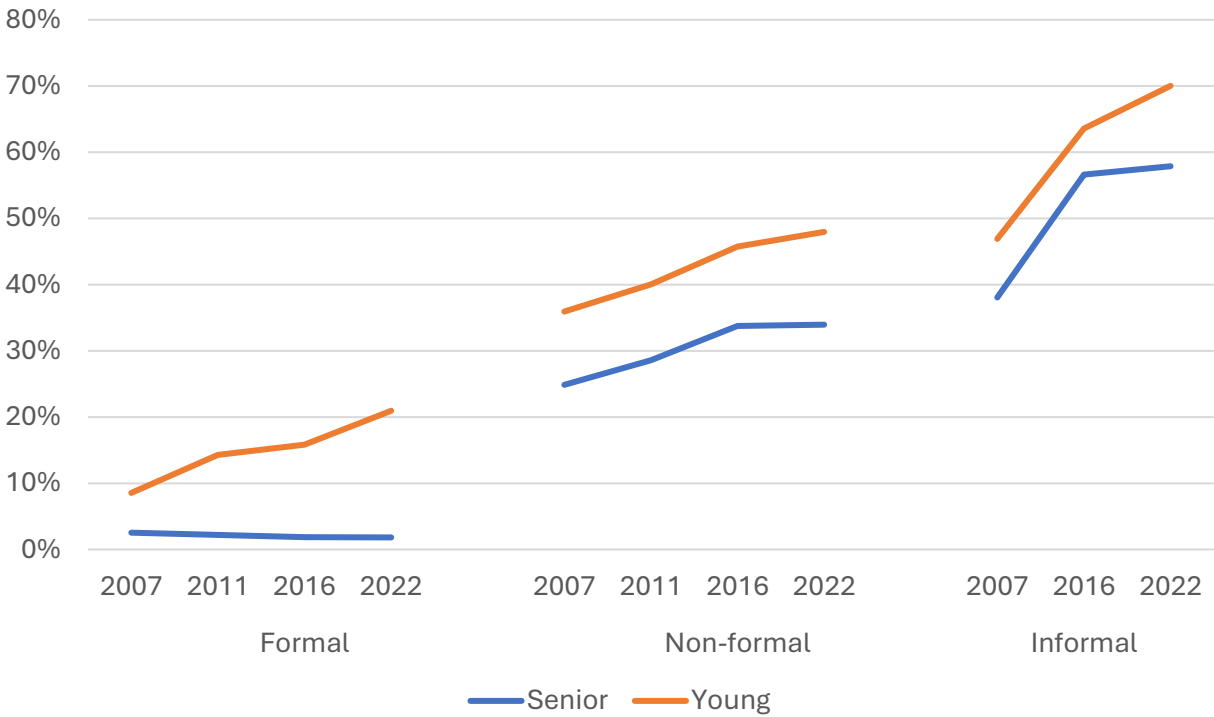


Figure 3. Participation rates in education and training types by age (weighted)

2.1.2.3 VARIATION IN PARTICIPATION RATES BY INCOME (T40 vs B60)

Figure 4 shows participation rates in formal, non-formal, and informal education and training by income groups (T40 and B60) from 2011 to 2022. Overall, participation in both groups has increased in all categories. The T40 group (top 40% income) consistently shows higher participation rates, especially in non-formal and informal education, reaching around 70% in informal learning by 2022. In contrast, the B60 group (bottom 60% income) has lower participation rates but shows steady growth over time, particularly in non-formal and informal education. This trend highlights an ongoing gap in access to educational opportunities based on income, although the gap has narrowed slightly in recent years. Further details on the participation rates are provided in **Table 18** in the appendix.

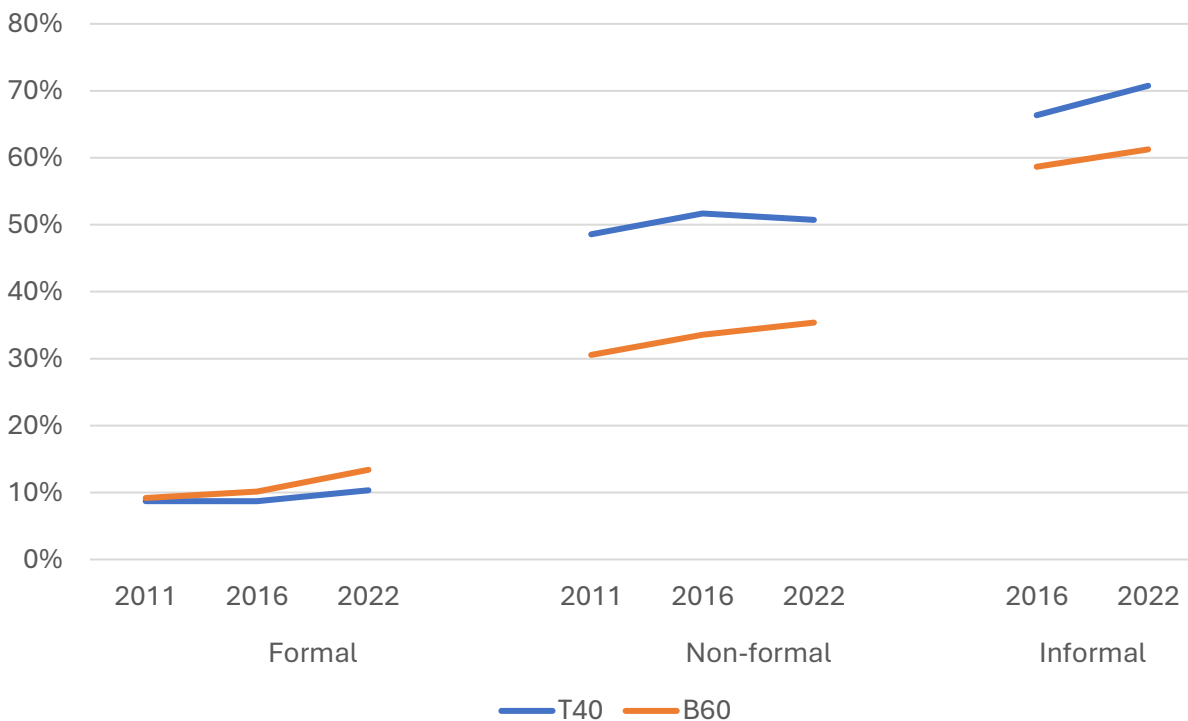


Figure 4. Participation rates in education and training types by income (weighted)

2.1.2.4 PARTICIPATION RATES BY EMPLOYMENT STATUS

Figure 5 illustrates participation rates in training programs by employment status (Employed, Unemployed, and Outside the Labour Force) across three types of training, Formal, Non-formal, and Informal, over the four waves. An overall upward trend is evident across all training types, indicating increasing engagement in training activities over time, regardless of employment status. In the Formal training category, individuals outside the labour force show higher participation rates than the unemployed and employed. This may suggest that those not currently working may have more opportunities or incentives to pursue structured education and skill development. In the Non-formal training category, participation has grown for all groups, with the employed maintaining the highest rates, likely due to workplace training or professional development initiatives. Finally, in the Informal training category, participation rates have surged significantly across all employment statuses, with the employed showing the highest engagement, followed closely by unemployed individuals and those outside the labour force. This trend suggests an increasing reliance on informal learning opportunities, possibly due to their accessibility and flexibility. **Table 19** in appendix provides a detailed breakdown of the participation rates.

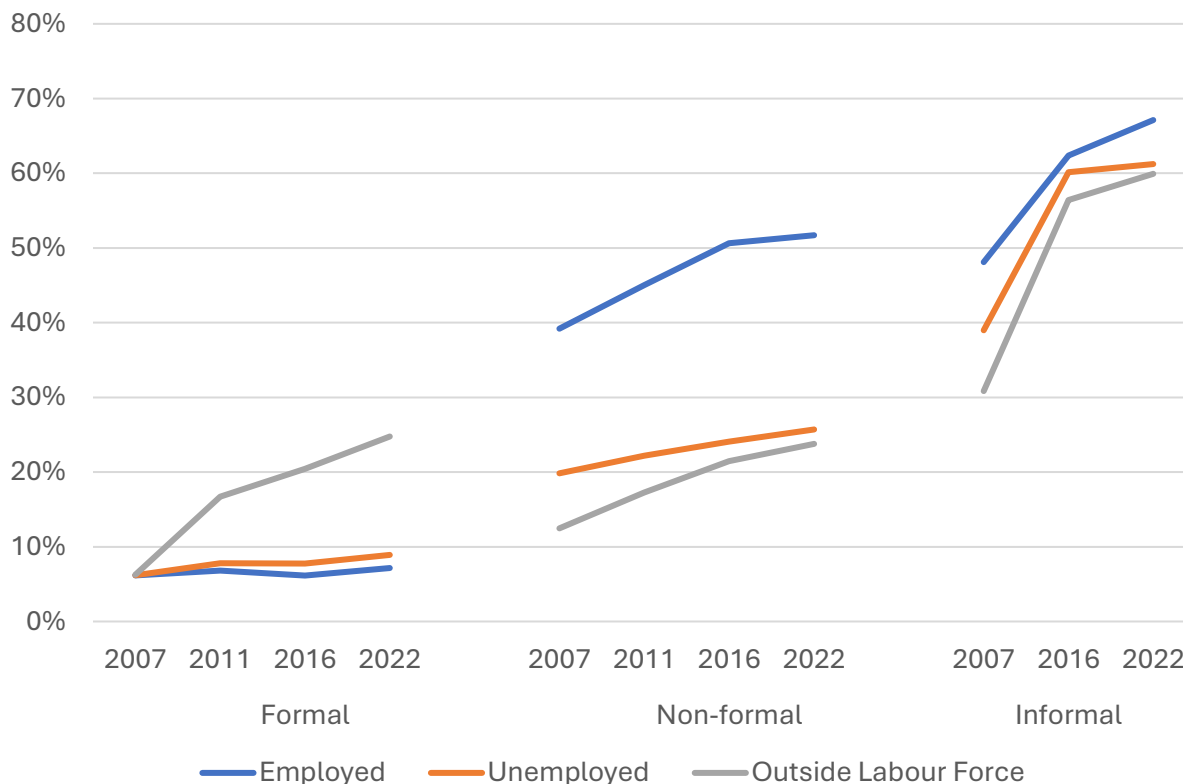


Figure 5. Participation rates in education and training types by employment status (weighted)

2.1.3 TRENDS IN WILLINGNESS TO PARTICIPATE WITH REGARD TO PRIOR EXPERIENCE IN SIMILAR ACTIVITIES

To examine the willingness of individuals to participate in education and training, the analysis was focused on responders aged 25-64 and data from all waves of the AES were utilized. However, certain observations were excluded from the dataset to maintain the overall quality and comparability of the results. Specifically, data from Denmark, Slovakia, and Germany in AES 2007; Malta, Romania, and the United Kingdom in AES 2011; Norway in AES 2016; and six observations from the Czech Republic in AES 2007 were removed due to low reliability issues or differences in national questionnaires.

To illustrate the trends in willingness to participate in education and training, the following graph (**Figure 6**) displays the percentages of individuals eager to engage, categorized by those with prior experience in such activities and those without, across four survey waves. As shown in **Figure 6**, individuals with previous experience in education and training exhibit a higher willingness to participate compared to those lacking such experience, except in the year 2007. Furthermore, there is a clear upward trend in willingness among those with prior experience, suggesting that past involvement in formal and non-formal education and training significantly encourages future participation. Conversely, individuals without prior experience demonstrate an overall decline in willingness.

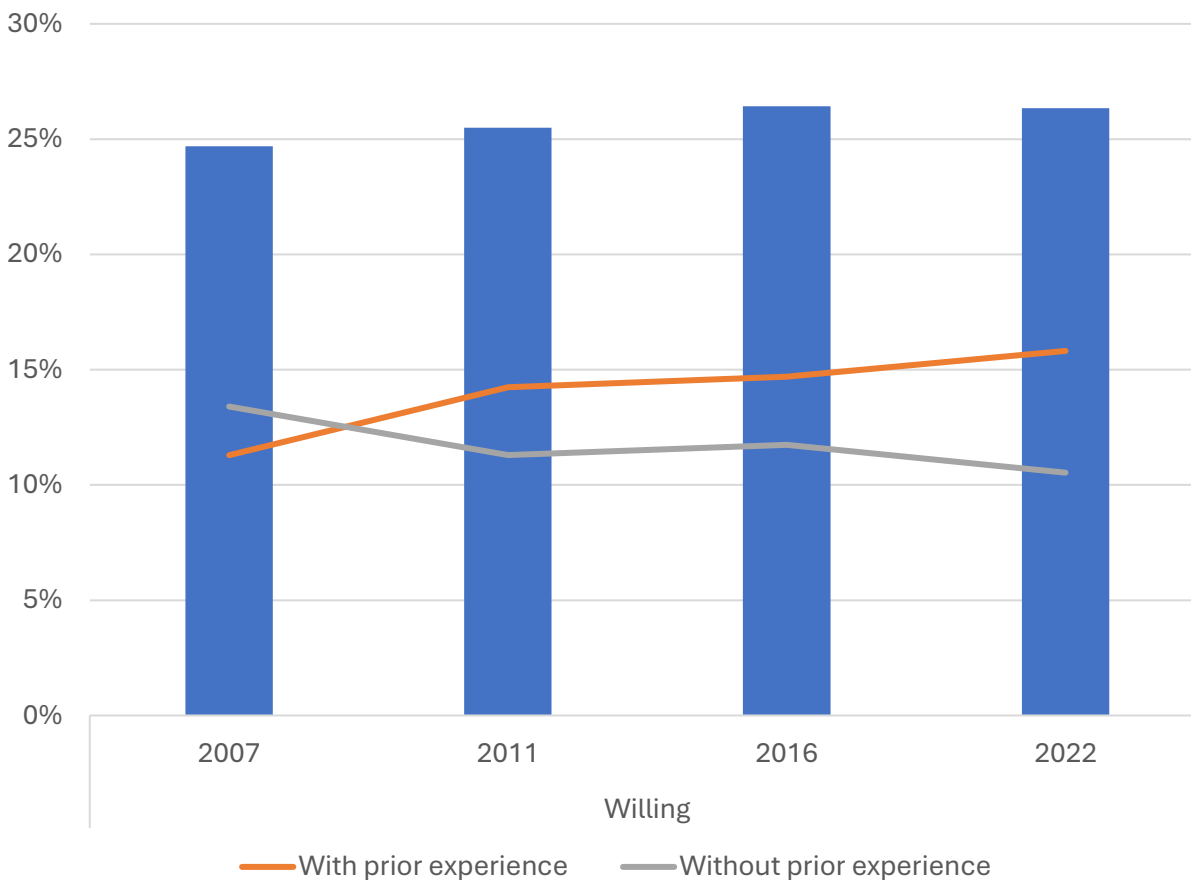


Figure 6. Willingness to participate in education and training

Table 20 in Appendix provides a complete breakdown of responses by prior experience.

2.1.3.1 WILLINGNESS TO PARTICIPATE IN EDUCATION AND TRAINING DEMOGRAPHICS

2.1.3.1.1 GENDER

This section highlights the trend in willingness to engage in adult education and training over time, analyzed by gender. **Figure 7** illustrates that overall, the willingness to participate in education and training has increased for both males and females, with females demonstrating a higher level of willingness than their male counterparts. Despite a widening gender gap over time, when considering prior experience, both males and females exhibit similar trends. Individuals with prior experience show a consistent increase in their willingness to participate, whereas those without previous experience demonstrate a decline in willingness between 2007 and 2022. A comprehensive breakdown of responses across all categories (willing, not willing, and no response) by gender is detailed in **Table 21** in the appendix.

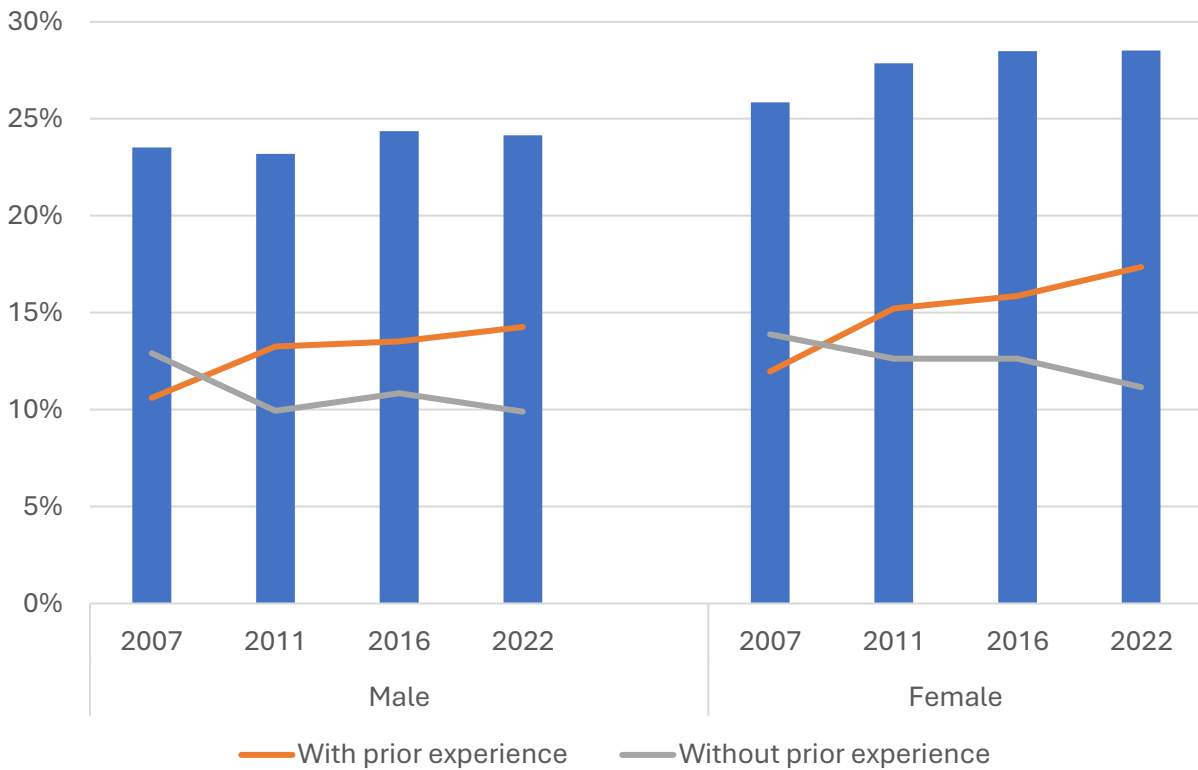


Figure 7. Gender differences in willingness to participate in education and training

2.1.3.1.2 AGE (SENIORS vs YOUNG)

Figure 8 shows trends in the willingness to engage in education and training, segmented by age group, specifically focusing on Seniors (aged 48-64) and Young individuals (aged 25-47). Overall, the willingness to participate is consistently higher among young people than among seniors in all observed years, though the age gap slightly narrowed in 2022 compared to 2007. Both age groups have demonstrated an increased willingness to pursue education and training over time, with seniors exhibiting more steady growth than their younger counterparts. The decline observed among the young group without prior experience has contributed to a more minor overall increase in their willingness. In contrast, the increase in willingness among seniors is mainly driven by those with prior experience. **Table 22** in the appendix shows a comprehensive breakdown of responses across all categories (willing, not willing, and no response) by age.

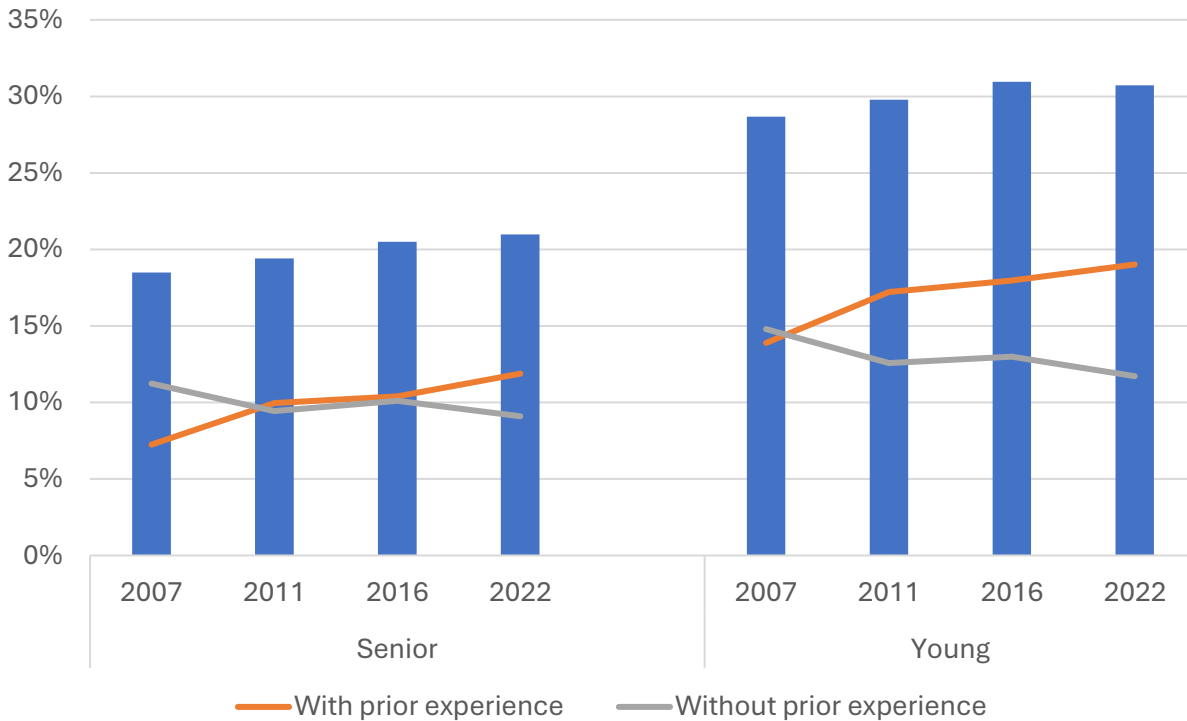


Figure 8. Age differences in willingness to participate in education and training

2.1.3.1.3 INCOME (TOP 40% vs BOTTOM 60%)

This section highlights the distinction between the top 40% (T40) and the bottom 60% (B60) income groups regarding their willingness to engage in education and training. Notably, data from the 2007 wave were excluded from the analysis due to significant inconsistencies compared to the other three waves. **Figure 9** illustrates that, when we examine the 2022 results, there are no substantial differences in overall willingness between the two income groups. However, a closer examination of trends from 2011 to 2022 reveals subtle shifts: the T40 group experienced a slight decline in willingness, decreasing from 27.6% in 2011 to 26.9% in 2022, while the B60 group saw a modest increase, rising from 25.3% to 26.6% during the same period. This indicates a gradual narrowing of the willingness gap between the two groups.

When considering prior experience, significant disparities emerge. Among individuals with prior experience, the T40 group consistently exhibits a higher willingness to engage in education and training than the B60 group, with their levels remaining relatively stable over the years. This pattern may reflect greater confidence, resources, or perceived benefits among higher-income individuals who have previously participated in such activities. Conversely, among those without prior experience, the B60 group is more willing to participate in education and training programs than the T40 group. This trend suggests stronger motivation among lower-income individuals to enhance their skills and opportunities, particularly when they lack prior exposure to these programs.

Table 23 in the appendix provides a comprehensive breakdown of responses across all categories (willing, not willing, and no response) by income.



Figure 9. Income differences in willingness to participate in education and training

2.1.3.2 WILLINGNESS TO PARTICIPATE IN EDUCATION AND TRAINING BY COUNTRY

Table 6 presents the willingness to participate in education and training across various countries over four survey waves (2007, 2011, 2016, and 2022). It reveals significant variations in participation rates, with some countries showing notable increases while others experience declines. For instance, Portugal (PT) demonstrated a remarkable rise, from 14.3% in 2007 to 47.5% in 2016, before stabilizing at 44.4% in 2022, indicating a strong and sustained interest in education and training. Similarly, Germany (DE) and Estonia (EE) show consistent growth, with Germany reaching 39.8% in 2022, up from 0% in 2007. In contrast, Belgium (BE) and Latvia (LV) exhibit significant declines, with Belgium dropping from 31.6% in 2007 to 19.0% in 2022. Countries like Cyprus (CY) and Ireland (IE) initially had high participation rates but saw substantial decreases by 2022. The data underscores the diverse trends in willingness across Europe, influenced by factors such as economic conditions, policy changes, and access to educational opportunities. Non-EU countries like Serbia (RS) also show increasing engagement, reaching 40.1% in 2022.

Table 6: Willingness to participate in education and training by country and wave

COUNTRY	ACRON.	2007 (%)	2011 (%)	2016 (%)	2022 (%)
Austria	AT	19.4%	20.1%	31.8%	28.7%
Belgium	BE	31.6%	30.1%	35.0%	19.0%
Bulgaria	BG	12.6%	8.6%	9.7%	10.1%
Croatia	HR	21.4%	0.0%	23.8%	24.0%
Cyprus	CY	63.3%	53.5%	60.2%	32.5%
Czech Republic	CZ	24.0%	11.5%	12.6%	9.3%
Denmark	DK	0.0%	45.6%	42.2%	30.7%
Estonia	EE	27.2%	36.9%	39.1%	39.1%
Finland	FI	31.3%	29.4%	27.9%	27.6%
France	FR	19.3%	34.4%	31.4%	30.2%
Germany	DE	0.0%	17.9%	14.9%	39.8%
Greece	EL	21.5%	22.1%	18.0%	16.5%
Hungary	HU	9.8%	15.3%	12.1%	21.8%
Ireland	IE	0.0%	73.7%	32.4%	28.3%
Italy	IT	25.3%	30.6%	31.4%	24.7%
Latvia	LV	28.4%	23.8%	41.4%	16.9%
Lithuania	LT	22.8%	13.2%	9.7%	14.8%
Luxembourg	LU	0.0%	48.2%	41.8%	38.1%
Malta	MT	0.0%	0.0%	30.9%	25.3%
Netherlands	NL	16.8%	24.0%	23.9%	24.9%
Poland	PL	21.7%	22.6%	25.8%	11.2%
Portugal	PT	14.3%	21.9%	47.5%	44.4%
Romania	RO	9.3%	0.0%	20.7%	19.8%
Slovakia	SK	0.0%	36.2%	19.5%	11.5%
Slovenia	SI	31.0%	24.5%	27.4%	28.5%
Spain	ES	16.7%	20.0%	19.0%	17.5%
Sweden	SE	39.8%	33.9%	29.7%	31.4%
<i>Non-EU</i>					
Bosnia Herzegovina	BA	0.0%	0.0%	12.7%	0.0%
North Macedonia	MK	0.0%	0.0%	21.6%	0.0%
Norway	NO	36.5%	43.2%	0.0%	35.2%
Serbia	RS	0.0%	24.4%	34.7%	40.1%
Switzerland	CH	0.0%	36.9%	33.2%	32.4%
United Kingdom	UK	48.0%	0.0%	42.7%	0.0%

2.1.4 DIFFICULTIES IN PARTICIPATING IN EDUCATION AND TRAINING PROGRAMS

In this section, we explore respondents' challenges in engaging with training programs. During surveys conducted in 2011, 2016, and 2022, participants were first asked whether they had participated in a training program and subsequently whether they wished to pursue further training. They were then questioned about their decisions based on their responses—either "yes, I would like to participate more" or "no, I wouldn't like to participate more". Those who indicated a reluctance to participate further were initially asked if they felt there was no need for additional training. For those who acknowledged a need for further training, follow-up questions were aimed at uncovering their hesitance.

Consequently, the following discussion regarding the challenges respondents face in participating in training programs is structured according to the survey format and is divided into three subsections. The first subsection (2.1.4.1) provides the difficulties encountered by responders in relation to their willingness. The second subsection (2.1.4.2) addresses the difficulties faced by those who wish to participate, while the second (2.1.4.3) focuses on those who recognize the need for training but choose not to participate.

It is important to note that AES2007 was not included in the analysis, as the variable used to capture the main difficulties (DIFFMAIN) was introduced in AES2011 and maintained a largely consistent in AES2016 and 2022. In contrast, AES2007 used two separate variables (NWNTMSTIMP, WNTMSTIMP), making direct comparison with later waves more challenging. Additionally, the variable corresponding to the need for further education and training (NEED) was introduced in AES2016 and has no directly comparable counterpart in AES2007. The exclusions applied in the previous analysis with willingness to participate (section 2.1.3) were maintained to ensure consistency and comparability.

Certain countries were also excluded due to low response rates or a high proportion of non-responses. Specifically, for the analysis of difficulties faced by those who wish to participate (section 2.1.4.2), the excluded countries include Belgium (BE), Ireland (IE), Slovakia (SK), Slovenia (SI), and Norway (NO) in the 2011 wave. In the 2016 wave, Denmark (DK), Estonia (EE), France (FR), the Netherlands (NL) and Switzerland (CH) were omitted from the dataset.

For the analysis of difficulties faced by those who recognize the need for training but choose not to participate (section 2.1.4.3) Belgium (BE) and Denmark (DK) in the 2016 wave were not mentioned.

2.1.4.1 OVERVIEW

Figure 10 presents the primary difficulties encountered by individuals in relation to their willingness to participate further in education and training. Across both groups, schedule conflicts emerge as the most significant barrier, with similar rates reported by both willing and unwilling respondents. Costs and family responsibilities are also prominent obstacles, though they significantly impact the unwilling group. Notably, individuals unwilling to engage in further training cite health or age-related reasons and lack of suitable educational opportunities at much higher rates than those who wish to participate, suggesting that structural and personal constraints disproportionately deter this group. Conversely, those willing to continue training report lack of employer or public service support and

other personal reasons as notable barriers, indicating that institutional and logistical challenges may hinder their participation. Overall, the findings highlight the necessity of addressing financial, structural, and support-related factors to improve access to education and training for both groups, with targeted interventions required for those currently unwilling to engage. **Table 24** in the appendix provides calculated figures.

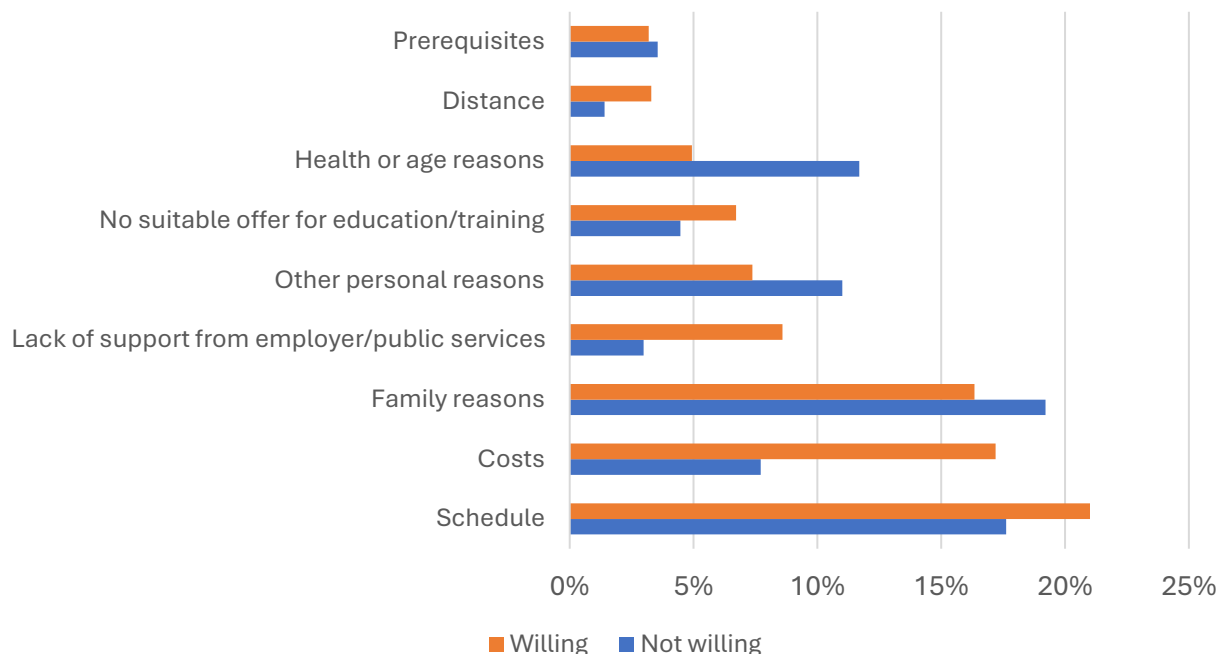


Figure 10. Barriers to education and training participation: Willing vs. Unwilling respondents

2.1.4.2 BARRIERS TO EDUCATION AND TRAINING FOR THOSE WHO ARE WILLING TO PARTICIPATE

Figure 11 illustrates the primary difficulties individuals who wish to participate more in education and training programs face. The most frequently cited barrier is schedule constraints, affecting nearly 20% of respondents, followed closely by costs and family reasons, which also represent significant obstacles. Lack of support from employers or public services and other personal reasons are also notable concerns, though to a lesser extent. On the lower end of the spectrum, health or age-related issues, distance, and prerequisites appear to be the least common barriers, suggesting that logistical and financial factors are more pressing than eligibility or accessibility concerns. The data highlights the need for more flexible scheduling, financial assistance, and institutional support to improve participation rates in education and training programs.

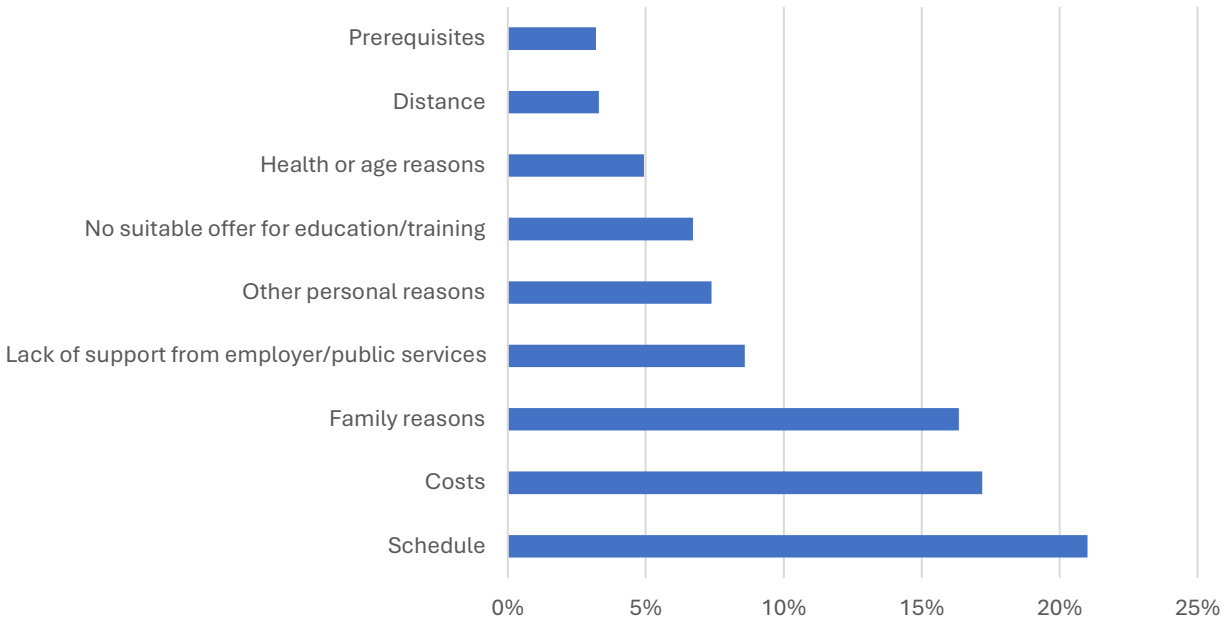


Figure 11. Main difficulties for people willing to participate (more) in education and training

2.1.4.2.1 BARRIERS TO PARTICIPATION OVER TIME (2011-2022)

Figure 12 illustrates the primary difficulties faced by individuals willing to participate more in education and training across three survey waves (2011, 2016, and 2022). Schedule conflicts consistently emerge as the most significant barrier, increasing over time, with the highest percentage recorded in 2022. Costs and family responsibilities also remain prominent obstacles across all waves, though their prevalence fluctuates slightly. Lack of support from employers or public services has shown minor variations but remains a relevant concern. Conversely, distance, prerequisites, and health or age-related reasons are reported at lower rates, suggesting they are less critical barriers than financial and logistical constraints. The persistence and, in some cases, escalation of these challenges underscore the need for targeted policies that promote flexible scheduling, financial support, and enhanced institutional backing to facilitate greater participation in training programs. **Table 25** in the appendix provides calculated figures.

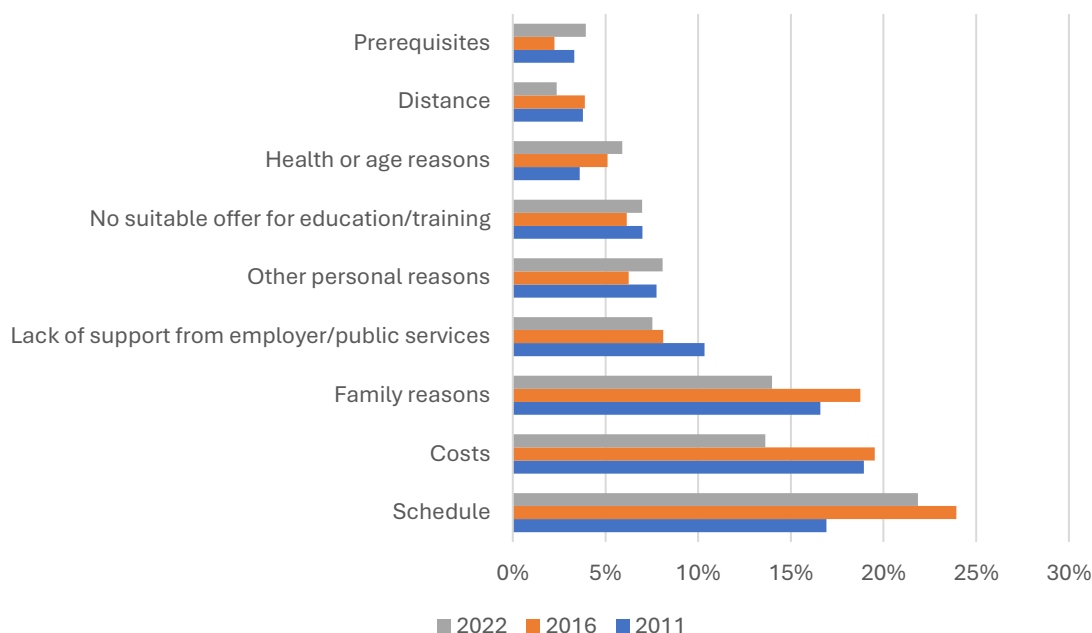


Figure 12. Barriers to education and training participation over time (2011–2022)

2.1.4.2.2 GENDER DISPARITIES IN BARRIERS TO TRAINING PARTICIPATION OVER TIME (2011–2022)

The three subfigures below in **Figure 13**, illustrate gender differences in the reported barriers to participation in education and training programs across three survey waves (2011, 2016, and 2022). Schedule conflicts consistently emerge as the most significant obstacle for both men and women, with men reporting a higher prevalence, particularly in 2016. Costs present a comparable challenge across genders, though women report slightly higher levels of concern. Family responsibilities disproportionately affect women, indicating a persistent gendered burden of caregiving that impacts training participation. In contrast, barriers such as lack of support from employers/public services, other personal reasons, and unsuitable training offers show relatively minor gender differences and a stable trend over time. Health or age-related constraints, distance, and prerequisites remain less frequently reported barriers, with marginal gender differences. These findings highlight the need for targeted policy measures, such as flexible scheduling and financial assistance, to address the primary obstacles affecting both genders, while also acknowledging the distinct challenges women face, particularly regarding family responsibilities. **Table 26** in the appendix presents calculated figures in detail.

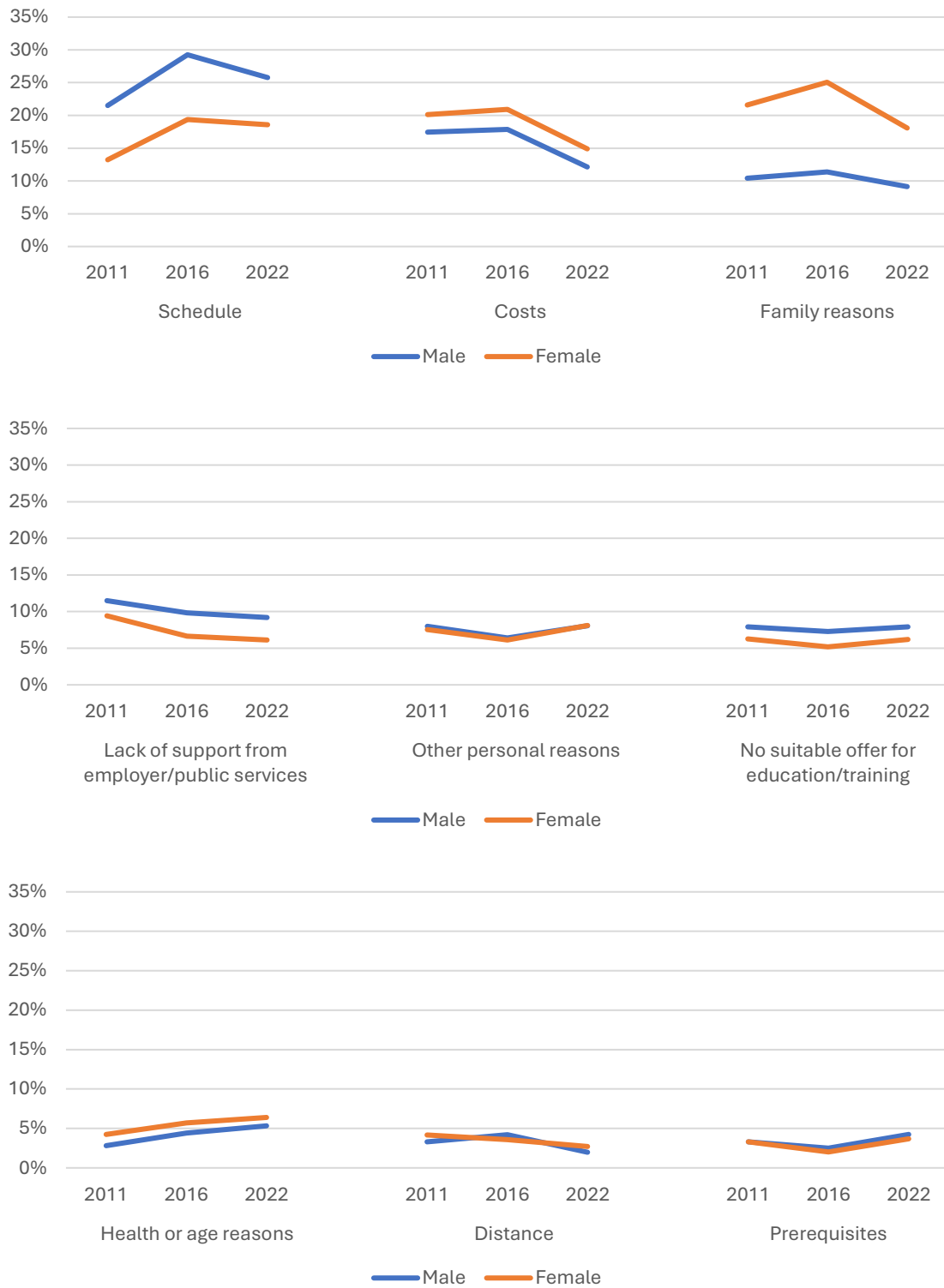


Figure 13. Gender disparities in barriers to training participation over time (2011–2022)

2.1.4.2.3 AGE-BASED DISPARITIES IN BARRIERS TO TRAINING PARTICIPATION OVER TIME (2011–2022)

The three subfigures below in **Figure 14** illustrate differences in the barriers to training participation between younger and senior individuals across three survey waves (2011, 2016, and 2022). Schedule conflicts are the most frequently cited obstacle for both age groups, with a slightly higher prevalence among younger individuals. Costs and family responsibilities also pose significant challenges, with younger respondents reporting higher levels of concern, particularly in 2016, suggesting that financial constraints and caregiving responsibilities weigh more heavily on younger adults. Meanwhile, lack of support from employers/public services, other personal reasons, and unsuitable training offers show minimal variation across age groups, indicating that these barriers affect both cohorts similarly. Health or age-related reasons, as expected, are a more prominent obstacle for senior individuals, while distance and prerequisites remain minor concerns for both groups.

These findings emphasize the need for age-sensitive policies, such as financial aid for younger individuals and tailored support for older participants facing health-related constraints, to enhance training accessibility for all age groups. The appendix (**Table 27**) contains the calculated figures.

2.1.4.2.4 INCOME-BASED DISPARITIES IN TRAINING PARTICIPATION BARRIERS (HIGHER VS. LOWER INCOME, 2011–2022)

The three subfigures below in **Figure 15** compare the barriers to training participation between individuals in the top 40% income group (T40) and those in the bottom 60% income group (B60) across three survey waves (2011, 2016, and 2022). Schedule conflicts emerge as the most significant challenge for both income groups, with a sharp peak among higher-income individuals (T40) in 2016, while lower-income individuals (B60) report a more consistent trend. Costs represent a substantially more significant barrier for B60 respondents, particularly in 2016, highlighting the financial constraints that lower-income individuals face in accessing training opportunities. Family responsibilities appear to be a more pronounced obstacle for the lower-income group, especially in 2016. Other barriers, including lack of employer/public service support, other personal reasons, and unsuitable training offers, show only minor differences between the two groups. As expected, health or age-related reasons are more commonly cited by lower-income individuals, while distance and prerequisites remain relatively low-level barriers for both groups. These findings underscore the need for financial aid policies and affordable training opportunities to support lower-income individuals, while flexible scheduling solutions could benefit both income groups to enhance participation in education and training programs. A detailed presentation of the calculated figures is available in **Table 28** in the appendix.

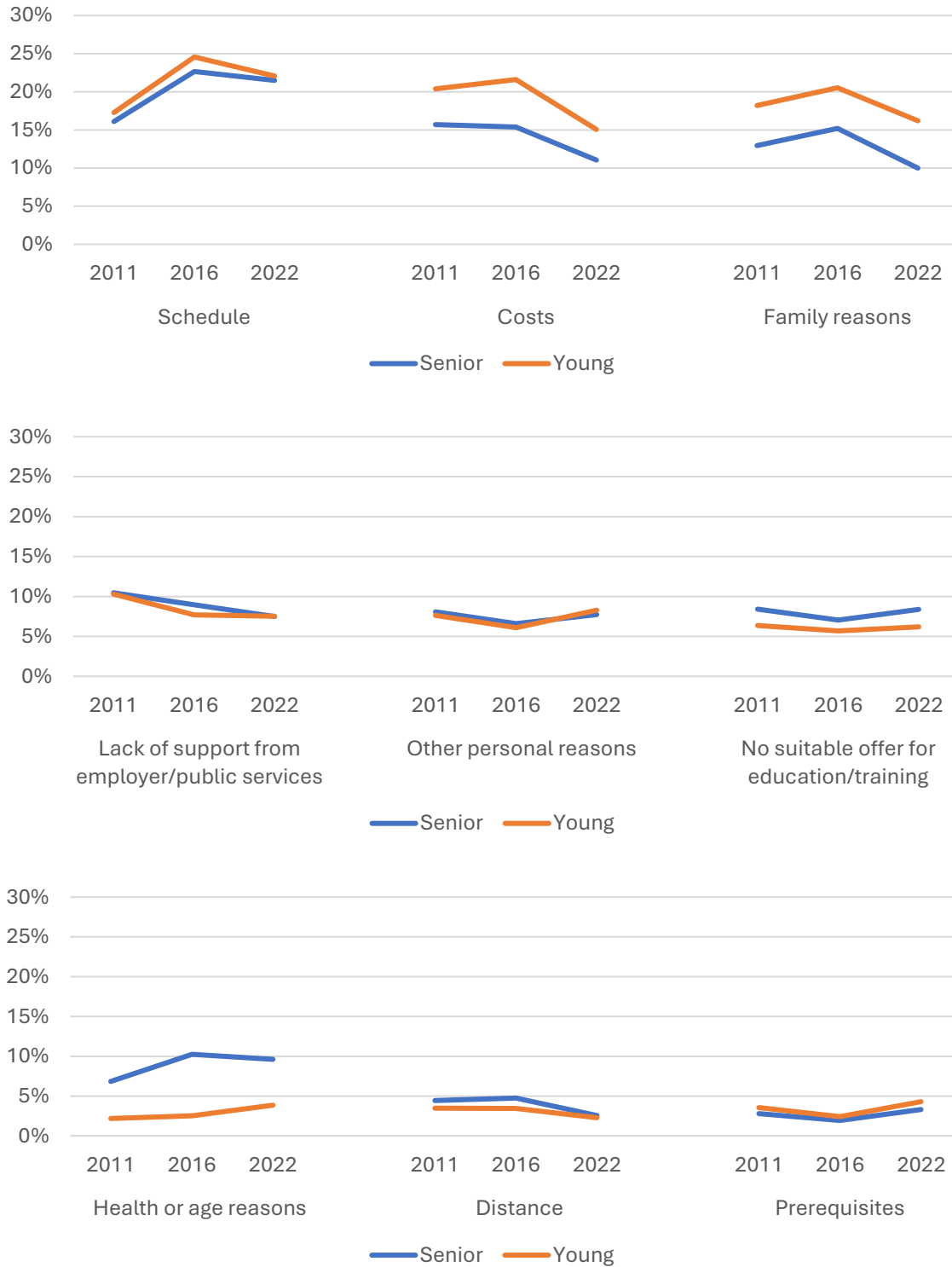


Figure 14. Age-based disparities in barriers to training participation (2011–2022)

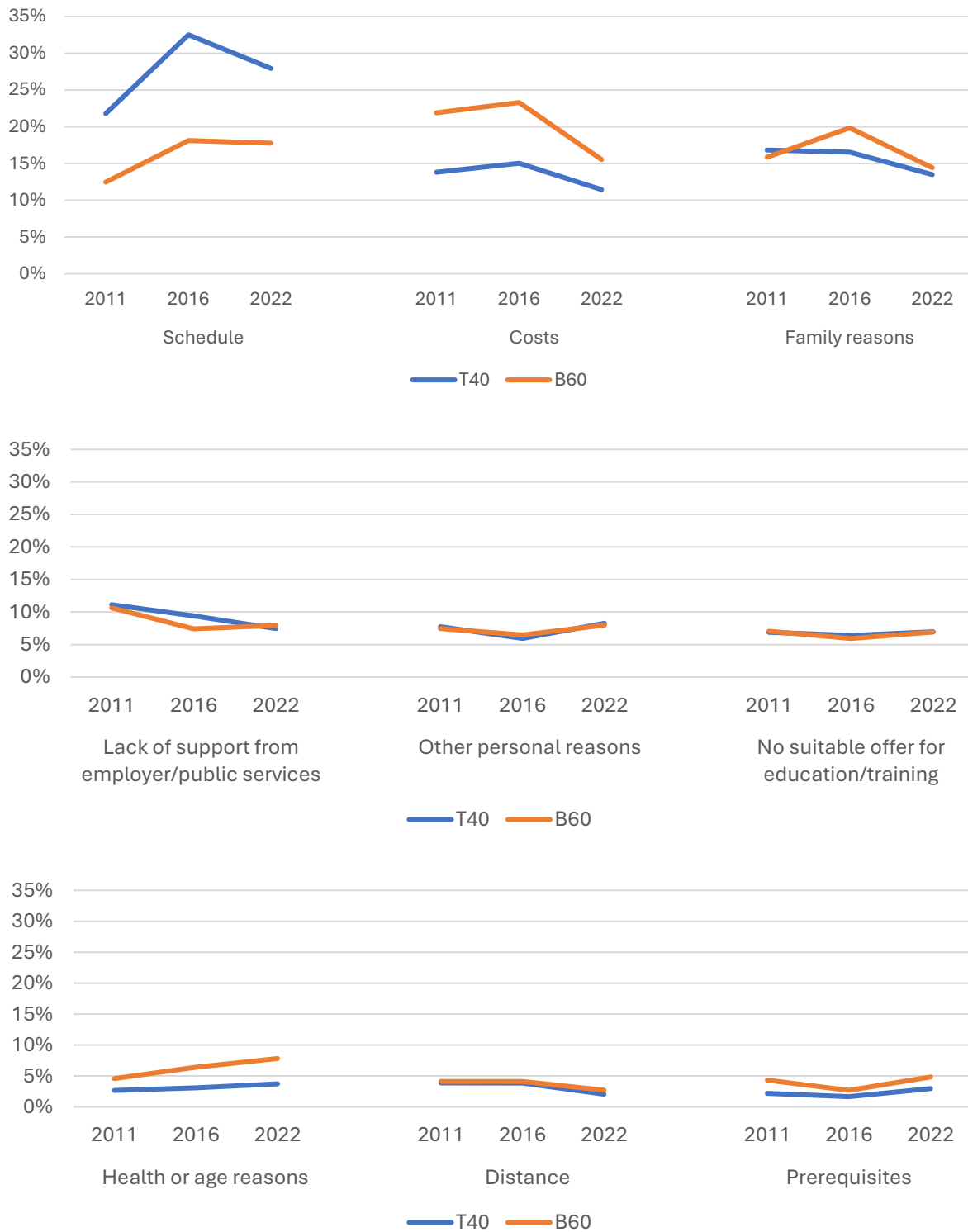


Figure 15. Income-based disparities in training participation barriers (Higher vs. lower income, 2011–2022)

2.1.4.3 BARRIERS TO EDUCATION AND TRAINING FOR THOSE WHO ARE NOT WILLING TO PARTICIPATE

This section outlines the responses regarding potential barriers faced by individuals unwilling to engage in education and training programs. As previously noted, the survey begins by inquiring whether participants wish to participate in such programs. Those who respond with ‘no’ are subsequently asked if they believe they do not require additional education or training. The specific wording of the related survey question is, “Is this because you did not need additional education or training?” The results, illustrated in **Figure 16**, indicate that nearly 80% of those who decline to participate in education and training programs feel that they do not need further training.

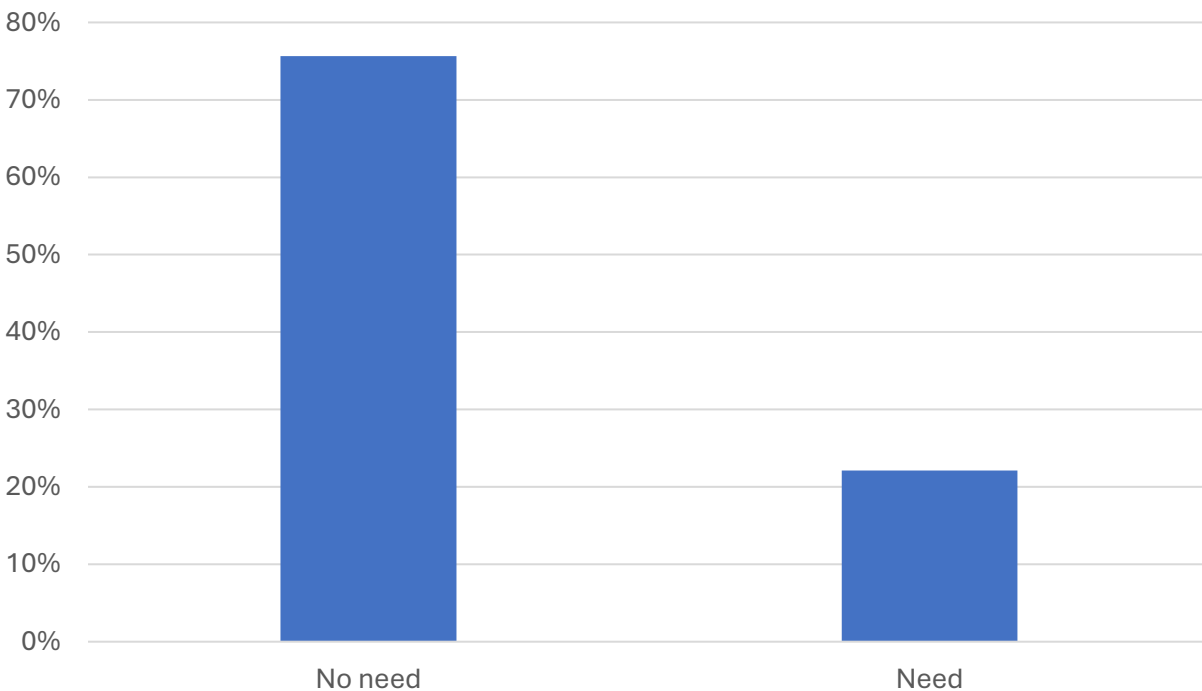


Figure 16. Need for (further) education & training

Next, those who answered that they needed further training were asked about the main barriers that deterred their participation. As mentioned before, the variable corresponding to the need for further education and training (NEED) was introduced in AES2016. Therefore, the comparison between AES2016 and AES2022 is considered to be more appropriate

2.1.4.3.1 BARRIERS TO PARTICIPATION

Figure 17 outlines the main barriers preventing individuals from pursuing further education and training. Family responsibilities are the most significant obstacle, followed by scheduling conflicts, indicating that time constraints and caregiving duties are crucial factors. Health issues and personal

reasons also contribute to disengagement, while financial costs are a moderate concern. Other factors, such as lack of support and unsuitable training options, are less frequently reported. These findings suggest the need for targeted interventions, like flexible learning schedules, to support those balancing family and work commitments.

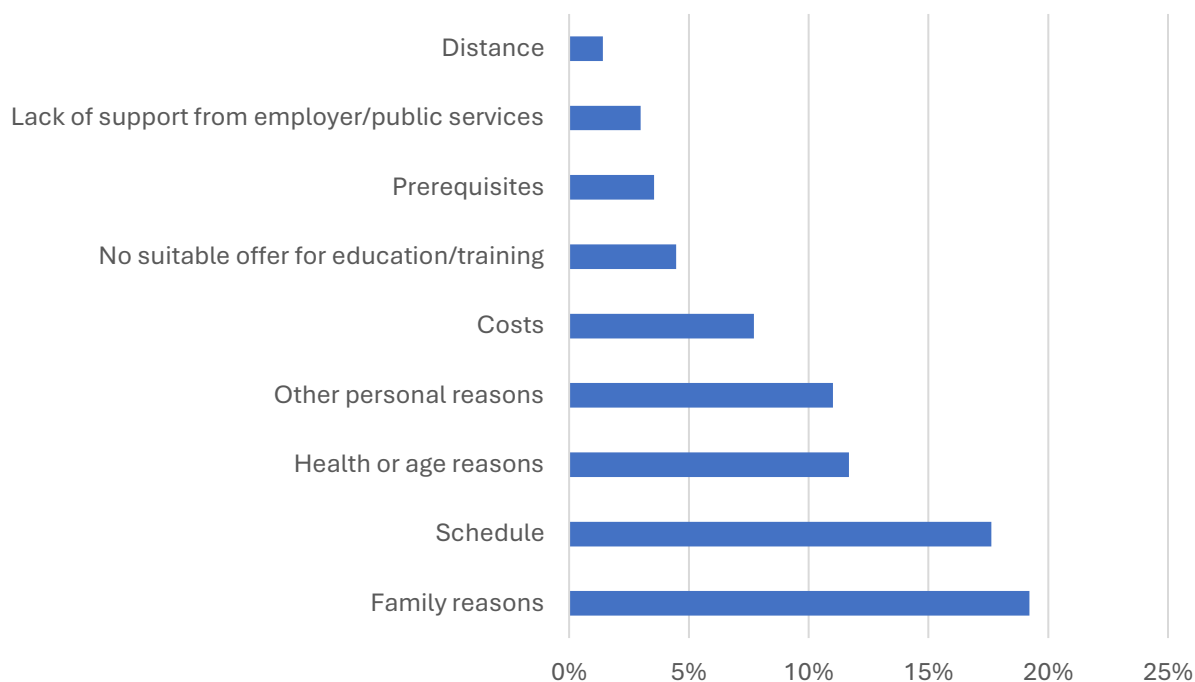


Figure 17. Key barriers to education and training participation among unwilling participants

Figure 18 explores the evolution of barriers between 2016 and 2022. The data reveal relative stability in the ranking of obstacles, with family responsibilities and scheduling conflicts continuing to be the primary concerns. Health and age-related issues appear to have slightly increased in prevalence, particularly in 2022, reflecting demographic changes and the potential influence of external factors such as economic conditions or public health crises. Financial constraints have remained a moderate but persistent challenge, while structural barriers—such as distance, prerequisites, and insufficient support from employers or public services—show minimal variation over time. These findings indicate that, although financial and institutional concerns remain significant, interventions aimed at enhancing flexibility in training programs and providing support for individuals with caregiving responsibilities could considerably increase participation rates. Calculated figures are provided in **Table 29** in the appendix.

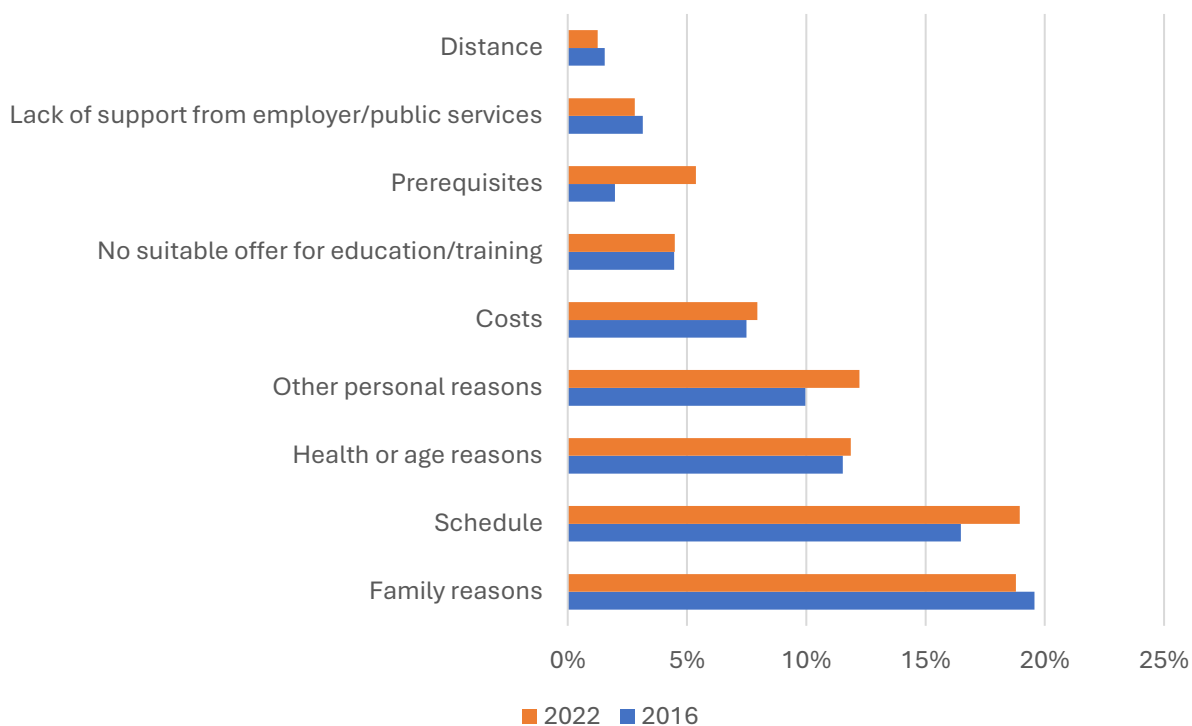


Figure 18. Changes in key barriers to education and training participation among unwilling participants by wave

2.1.4.3.2 GENDER DISPARITIES IN BARRIERS TO TRAINING PARTICIPATION OVER TIME (2011–2022)

The subfigures in **Figure 19** depict the evolution of gender differences in reported barriers to training participation among individuals reluctant to pursue further education and training from 2016 to 2022. Family responsibilities are identified as a significant obstacle for women than men; however, both genders exhibit a slight decline in this barrier over time. In contrast, schedule conflicts show an upward trend for both men and women, with men reporting slightly greater constraints in 2022, indicating increased time-related pressures.

Health and age-related issues remain stable across genders, showing minimal discrepancies. Financial constraints and personal reasons exhibit slight variation between men and women, suggesting that these barriers impact both groups equally. Lack of support from employers or public services, prerequisites, and unsuitable training offerings remain relatively minor obstacles, with only modest increases noted over time. Distance is consistently cited as the least significant barrier, indicating that accessibility does not pose a major challenge for unwilling participants.

Overall, the findings suggest that while structural and financial barriers equally affect both genders, caregiving responsibilities disproportionately impact women. The growing challenge of scheduling conflicts for both genders underscores the necessity for flexible training options and policies that promote work-life balance to enhance participation rates. **Table 30** in the appendix contains the calculated figures.



Figure 19: Gender differences in barriers to training participation among unwilling individuals (2016–2022)

2.1.4.3.3 AGE-BASED DISPARITIES IN BARRIERS TO TRAINING PARTICIPATION OVER TIME (2016-2022)

The data in the subfigures in **Figure 20** illustrate the evolving barriers to training participation among younger and older individuals who are hesitant to pursue further education and training from 2016 to 2022. Family responsibilities remain a significant obstacle for both age groups, although this challenge appears more pronounced among younger individuals. Schedule conflicts have shown an upward trend for both demographics, with seniors experiencing a sharper increase, indicating growing time constraints among older adults. Health or age-related concerns understandably affect seniors more, remaining a consistent challenge over time, while younger individuals express minimal worries in this area.

Other barriers, including financial costs, personal reasons, and a lack of suitable training opportunities, show slight variation between the two groups, suggesting a shared experience regarding these challenges. Prerequisites are slightly more of a hurdle for younger participants, while lack of support from employers or public services and issues related to distance remain minor concerns for both groups.

The findings indicate that while family and time-related constraints disproportionately impact younger individuals, health issues and escalating scheduling conflicts are increasingly challenging for seniors. These insights underscore the need for age-sensitive policy interventions, such as flexible scheduling for older participants and support systems for younger individuals managing family responsibilities. **Table 31** in the appendix provides calculated figures.

2.1.4.3.4 INCOME-BASED DISPARITIES IN TRAINING PARTICIPATION BARRIERS (HIGHER VS. LOWER INCOME, 2016-2022)

The subfigures in **Figure 21** illustrate the evolution of barriers to training participation for higher-income (T40) and lower-income (B60) who are reluctant to pursue further education from 2016 to 2022. Family responsibilities remain a significant obstacle for lower-income individuals (B60), although the disparity between the income groups is relatively small. In contrast, schedule constraints have shown a marked increase for higher-income individuals (T40), suggesting an escalation in time-related pressures, likely due to professional obligations.

Lower-income individuals cite health or age-related reasons more frequently, although these factors have remained relatively stable over time. Financial barriers, such as costs, reveal only minor differences between the two income groups, indicating that financial constraints are not the primary reason for their unwillingness to engage in further education. Additionally, other personal reasons have experienced a slight uptick among higher-income individuals.

Barriers such as the lack of suitable training options, insufficient support from employers or public services, and distance remain minimal across both groups, with no significant changes observed over time. However, prerequisites are emerging as a growing concern, particularly among lower-income individuals.

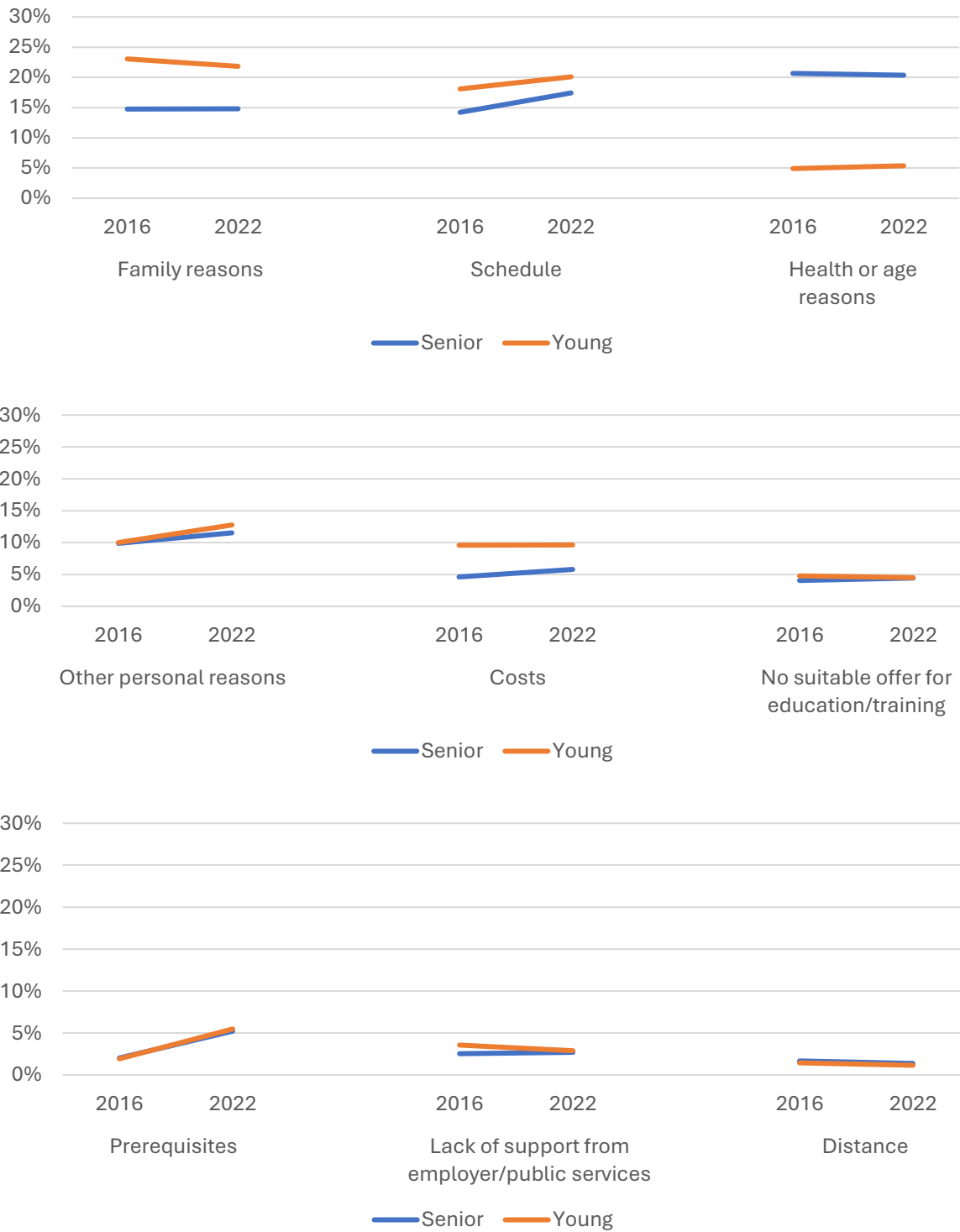


Figure 20: Age-based disparities in barriers to training participation among unwilling individuals (2016–2022)



Figure 21: Income-based disparities in barriers to training participation among unwilling individuals (2016–2022)

Overall, the findings suggest that while family responsibilities and financial barriers are more pronounced among lower-income individuals, schedule constraints and other personal reasons are increasingly influencing higher-income individuals. This underscores the need for income-sensitive policies, such as flexible professional training schedules and targeted support for lower-income individuals facing structural and family-related challenges. A detailed presentation of the calculated figures is available in **Table 32** in the appendix.

2.1.5 DETERMINANTS FOR EDUCATION AND TRAINING

2.1.5.1 EMPIRICAL STRATEGY

2.1.5.1.1 THREE WAVES

We investigate the determinants of individuals' willingness to participate in education and training programs (formal, non-formal and informal) by estimating a survey-weighted logit model using data from 2011, 2016 and 2022 AES (Adult Education Survey) waves

$$P(\text{Will_Part}_i = 1 | X_i) = \frac{\exp(X_i\beta)}{1 + \exp(X_i\beta)}$$

where X_i is the vector of explanatory variables, and β represents the coefficients to be estimated. The dependent variable Will_Part_i , equals one if individual i is willing to participate in formal, nonformal or informal education and training programs, and zero otherwise. The vector X_i includes key independent variables such Seek_Info_i , which indicates whether the respondent actively sought training information, and Difftype_i , which categorizes barriers to participation, such as logistical constraints or perceived irrelevance of training. To assess the effect of prior training exposure, the model includes Past_Part_i , which identifies individuals with past training participation and its interaction with training barriers (Difftype_i) to examine whether previous experiences moderate the impact of obstacles.

To account for education fatigue, the model incorporates Hatyear_i , defined as the number of years since the respondent completed their highest level of education, and its squared term to capture potential nonlinear effects. Additionally, Age_i and Age_sq_i are included in evaluating the effect of time since formal education varies across age groups.

Further controls include gender (Gender_i), income level (Income_i), employment status ($\text{Employment_Status}_i$), and country effects (Country_i) to capture structural labour market differences and ϵ_i is the error term. The variable is only asked of those who feel that they need further education and training. This creates a selection problem, as those who do not feel the need for education and training might systematically differ from those who do. By applying the inverse probability weight (IPW), we adjust for these selection effects, ensuring that the estimated impact of barriers reflects a more representative population rather than just those who self-report obstacles. We first estimate the probability of someone to answer the Difftype_i using the model:

$$\begin{aligned} \text{logit}(\text{Difftype}_i) &= \beta_0 + \beta_1 \text{Age}_i + \beta_2 \text{Gender}_i + \beta_3 \text{Income}_i + \sum_j \beta_j \text{Country} \\ &+ \sum_k \beta_k \text{Employment_Status}_i + \epsilon_i \end{aligned}$$

Then, the model is estimated using survey weights (*Respweight*) multiplied by the inverse IPW to ensure representativeness and correct for complex sampling designs.

$$\begin{aligned} \text{logit}(\text{Will_Part}_i) &= \beta_0 + \beta_1 \text{Seek_Info}_i + \beta_2 \text{Difftype}_i + \beta_3 \text{Past_Part}_i + \beta_4 (\text{Difftype}_i \times \text{Past_Part}_i) \\ &+ \beta_5 \text{Hatyear}_i + \beta_6 \text{Age}_i + \beta_7 (\text{Hatyear}_i \times \text{Age}_i) \\ &+ \beta_8 \text{Gender}_i + \beta_9 \text{Income}_i + \sum_j \beta_j \text{Country} + \sum_k \beta_k \text{Employment_Status}_i + \epsilon_i \end{aligned}$$

2.1.5.1.2 TWO WAVES

Further analysis considers guidance regarding learning received from institutions/organisations during the last 12 months using the variable *Guide_i*. The variable *Guide_i* is only available in 2016 and 2022 waves and thus, we estimate model once again adding the variable *Guide_i*.

$$\begin{aligned} \text{logit}(\text{Will_Part}_i) &= \beta_0 + \beta_1 \text{Seek_Info}_i + \beta_2 \text{Difftype}_i + \beta_3 \text{Past_Part}_i + \beta_4 (\text{Difftype}_i \times \text{Past_Part}_i) \\ &+ \beta_5 \text{Hatyear}_i + \beta_6 \text{Age}_i + \beta_7 (\text{Hatyear}_i \times \text{Age}_i) + \beta_8 \text{Guide}_i + \beta_9 (\text{Guide}_i \times \text{Past_Part}_i) \\ &+ \beta_{10} \text{Gender}_i + \beta_{11} \text{Income}_i + \sum_j \beta_j \text{Country} + \sum_k \beta_k \text{Employment_Status}_i + \epsilon_i \end{aligned}$$

2.1.5.2 RESULTS

Table 7 presents the results from two survey-weighted logistic regression models estimating the determinants of willingness to participate in education and training (*Will_Part_i*). The first model includes data from 2011, 2016, and 2022 waves, while the second model is restricted to the 2016 and 2022 waves. Both models control for country fixed effects to account for structural differences across national training systems.

The strong positive and highly significant effect of *Seek_Info_i* (1.31 in Model 1, 1.22 in Model 2) indicates that individuals actively seeking information on training opportunities are substantially more likely to express willingness to participate. The slightly lower coefficient in Model 2 suggests that information-seeking effects may have weakened somewhat over time, potentially due to improvements in access to digital information or it could be related to sample differences.

Table 7: Models for determinants in education and training

	<i>Will_Part_i</i>	<i>Will_Part_i</i>
<i>Seek_Info_i</i>	1.31** (0.01)	1.22** (0.02)
<i>Difftype_i</i>	0.72** (0.03)	0.67** (0.05)
<i>Past_Part_i</i>	0.56** (0.04)	0.75** (0.06)
<i>Difftype_i × Past_Part_i</i>	-0.31** (0.044)	-0.41** (0.06)
<i>Hatyear_i</i>	0.002 (0.002)	0.002 (0.002)
<i>Age_i</i>	0.01*** (0.001)	0.01*** (0.001)
<i>Hatyear_i#Age_i</i>	-0.0004*** (-0.00004)	-0.0005*** (0.00005)
<i>Gender_i (Female)</i>	0.18** (0.01)	0.10** (0.01)
<i>Income_i</i>	0.11** (0.01)	0.09** (0.02)
<i>Unemployed</i>	0.26** (0.02)	0.210** (0.027)
<i>Retired</i>	-0.31** (0.03)	-0.290** (0.042)
<i>Outside labour market</i>	-0.19** (0.02)	-0.167** (0.024)
<i>Guide_i</i>		0.55** (0.03)
<i>Guide_i × Past_Part_i</i>		-0.60** (0.04)
Intercept	-2.34** (0.11)	-1.84** (0.08)
waves	2011, 2016, 2022	2016, 2022
country fixed effects	Yes	Yes
#obs.	587,474	411,560

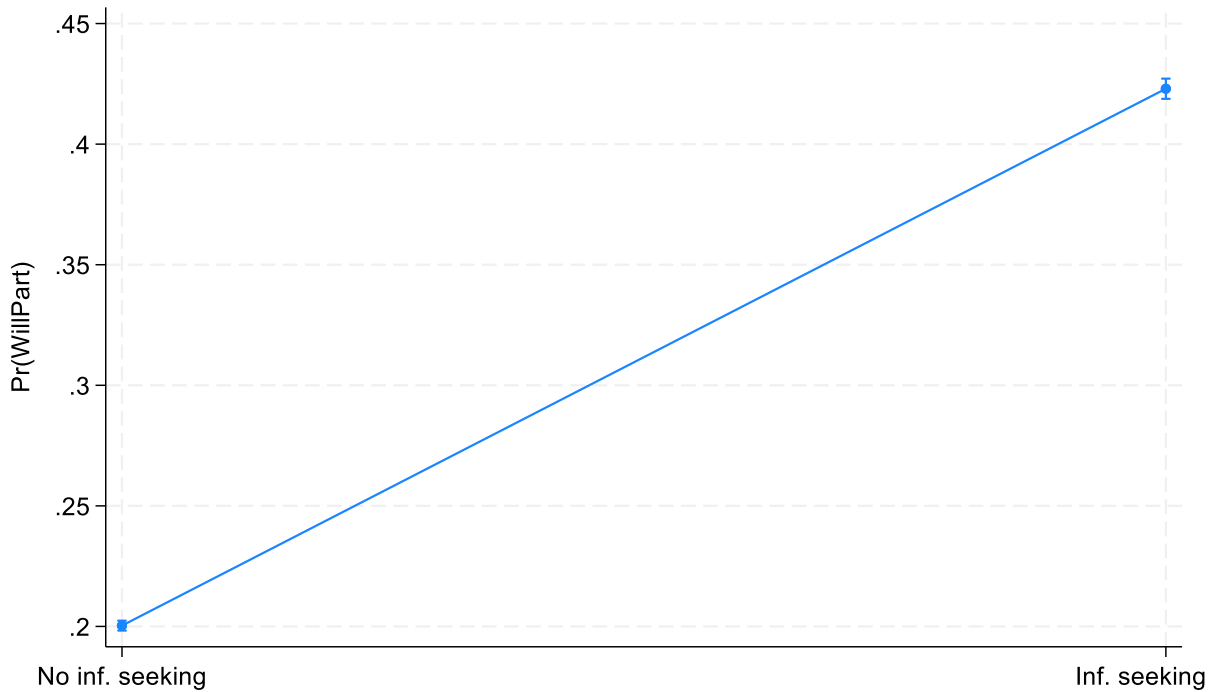


Figure 22. Effect of information seeking on training willingness

The results for $Difftype_i$ are surprising since they suggest that individuals who recognize barriers to participation are still motivated to train. This reinforces the idea that external constraints (e.g., financial, time, or employer restrictions) may limit access rather than personal disinterest. However, the negative interaction term ($Difftype_i \times Past_Part_i$) (-0.31 in Model 1, -0.41 in Model 2) indicates that barriers strongly discourage those with past training experience. This may reflect frustration or disappointment with previous training experiences that did not yield the expected benefits.

Past training ($Past_Part_i$) is positively associated with willingness (0.56 in Model 1, 0.75 in Model 2), meaning that individuals who have engaged in training before are more likely to continue.

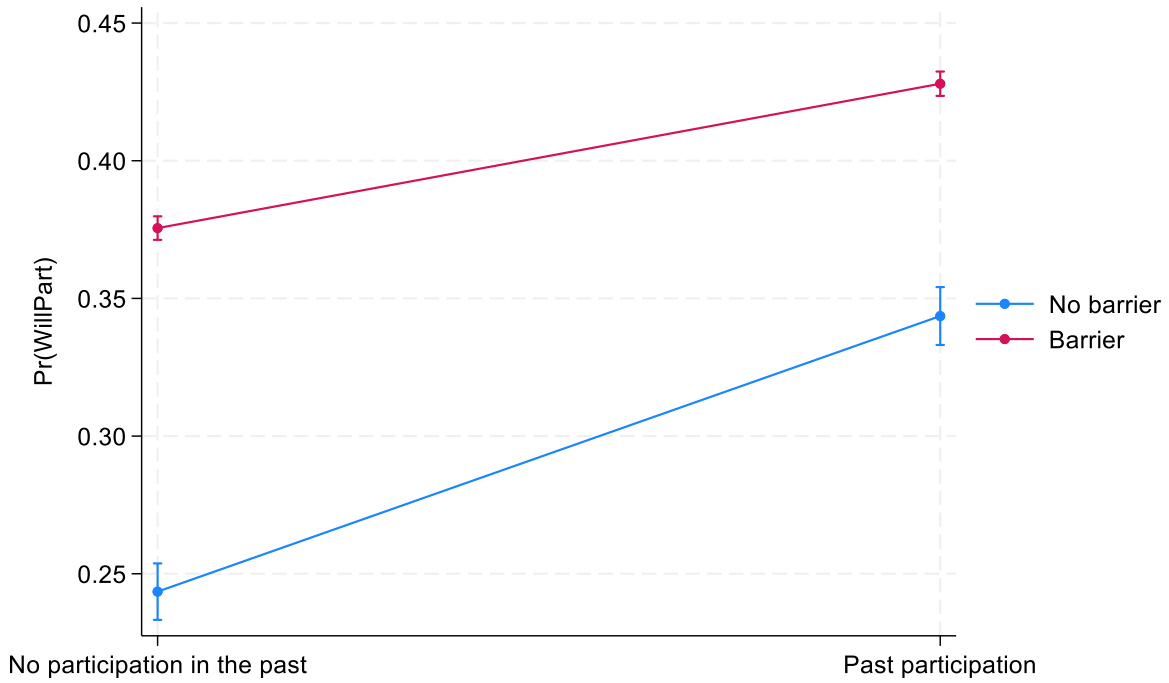


Figure 23. Predicted Training Willingness by Barrier Presence and Past Participation

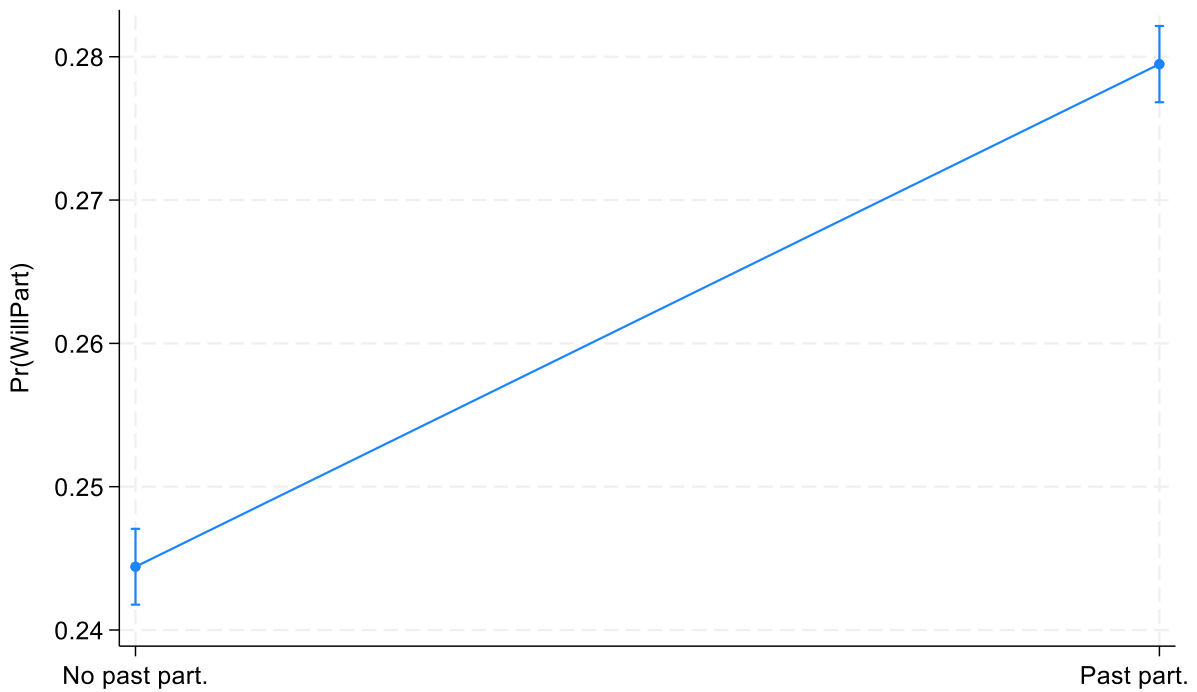


Figure 24. Effect of past participation on training willingness

The effect of $Year_i$ in both models is positive but statistically insignificant and for estimating its overall impact we will consider the interaction term with the Age_i which is negative and statistically significant in both models. This indicates that as individuals age, the positive influence of years since education completion diminishes, ultimately turning negative. The turning point calculation ($Age_i = 6.14$) suggests that this negative effect manifests very early in life, meaning that for almost all individuals in the sample, the willingness to participate in training declines as more years pass since completing their education. This result aligns with the concept of education fatigue, where individuals become increasingly detached from formal learning over time due to workplace experience, evolving personal priorities, or reduced perceived benefits of further training. Additionally, individuals who completed their education many years ago may lack institutional connections or employer-sponsored training opportunities, further reducing their participation rates. This finding underscores the importance of targeted lifelong learning policies that re-engage individuals who have been out of education for longer periods, particularly older workers who may perceive fewer benefits in upskilling or reskilling initiatives.

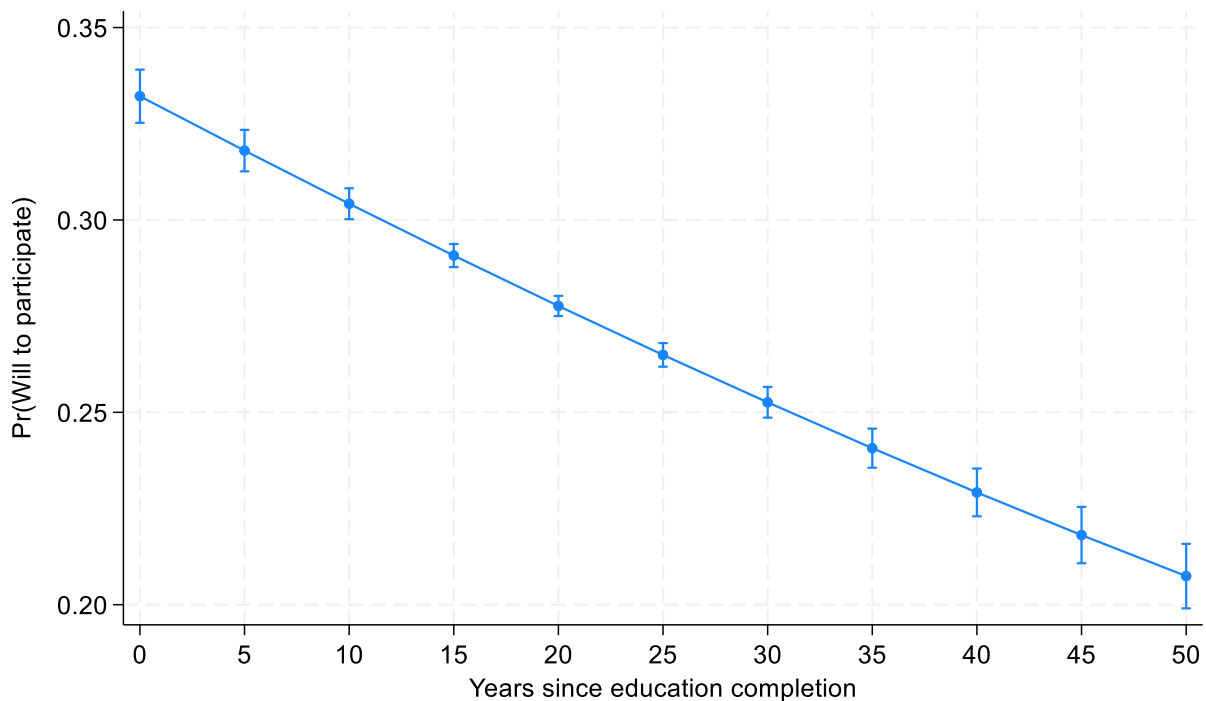


Figure 25. Marginal effect of years since education completion

Receiving guidance on training opportunities ($Guide_i = 0.55$) significantly increases willingness to train. However, the negative interaction effect ($Guide_i \times Past_Part_i = -0.60$) suggests that past training participants benefit less from guidance, potentially because they have already accessed training support in the past.

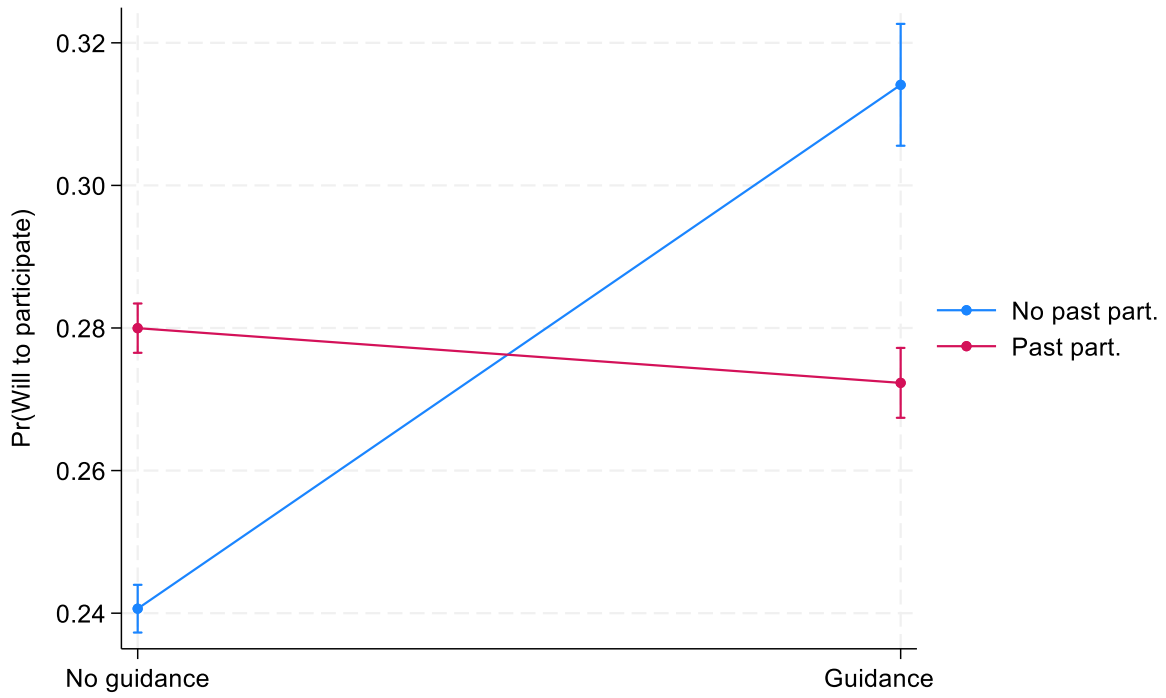


Figure 26. Impact of guidance on training willingness by past training experience

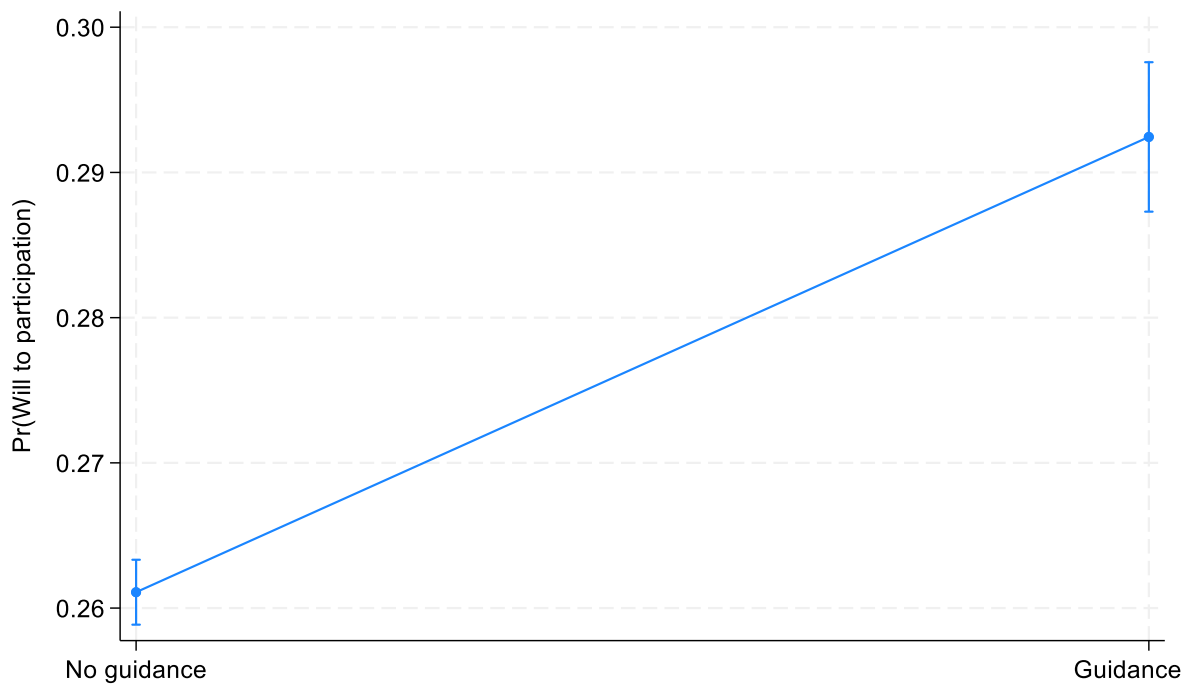


Figure 27. Effect of receiving guidance on training willingness

Women ($Gender_i = Female$) are more likely to express willingness to train (0.18 in Model 1, 0.1 in Model 2), consistent with research suggesting higher engagement in lifelong learning among women.

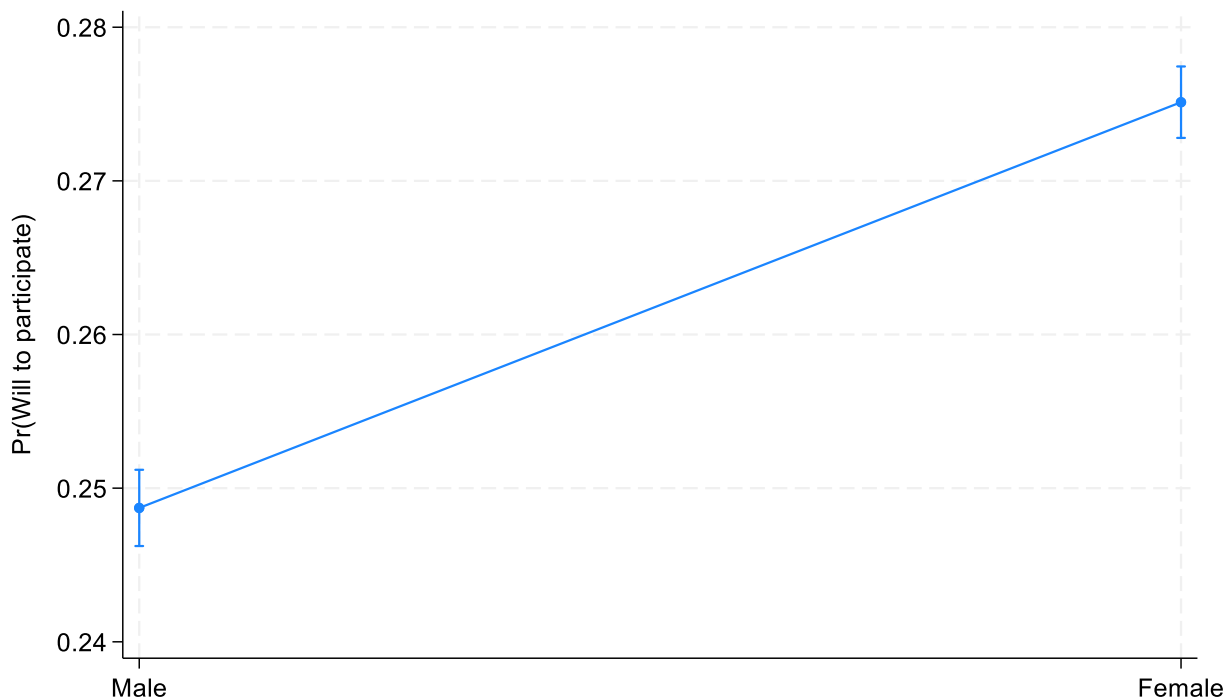


Figure 28. Effect of gender on training willingness

Income ($Income_i$) has a strong negative effect (0.11 in Model 1, 0.09 in Model 2), indicating that lower-income individuals are more likely to participate, potentially due to a greater need for skill development to improve employability. Furthermore, lower-income groups are more likely to qualify for publicly funded or subsidized training programs.

Unemployed individuals are more likely to want training (0.26 in Model 1, 0.210 in Model 2), suggesting that they see it as a pathway back into employment. Retired individuals and those outside the labour market show negative effects, indicating lower motivation for training.

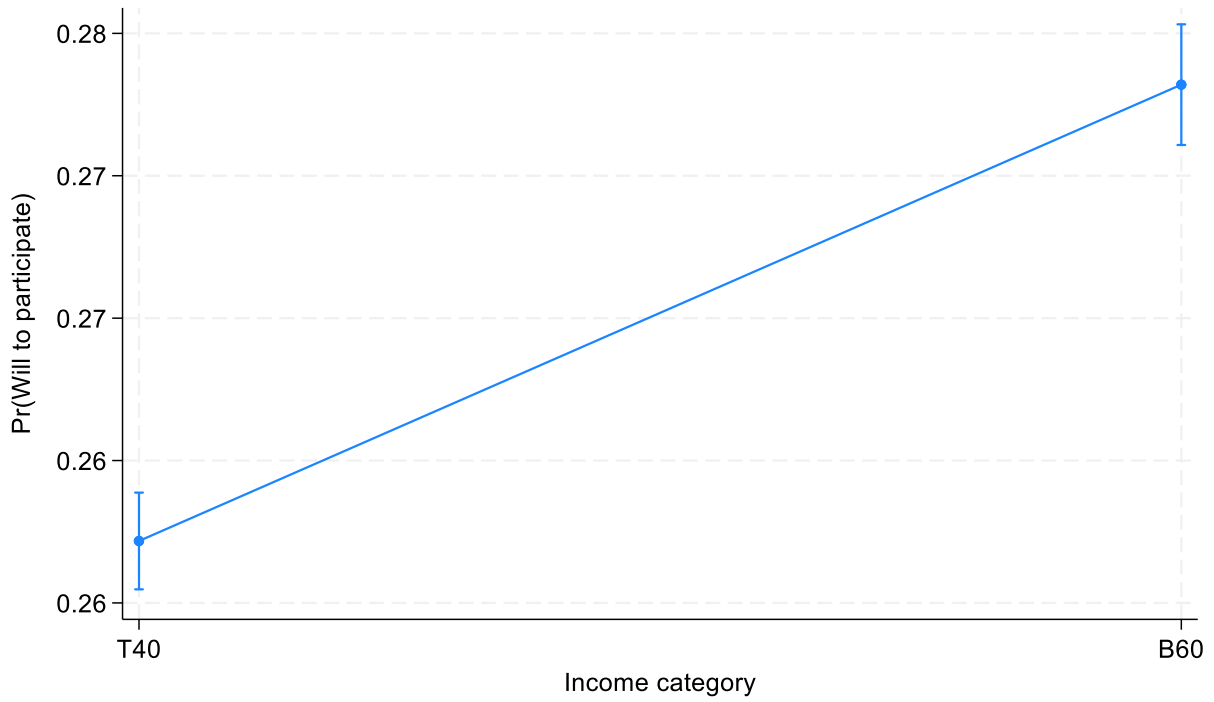


Figure 29. Effect of income on training willingness

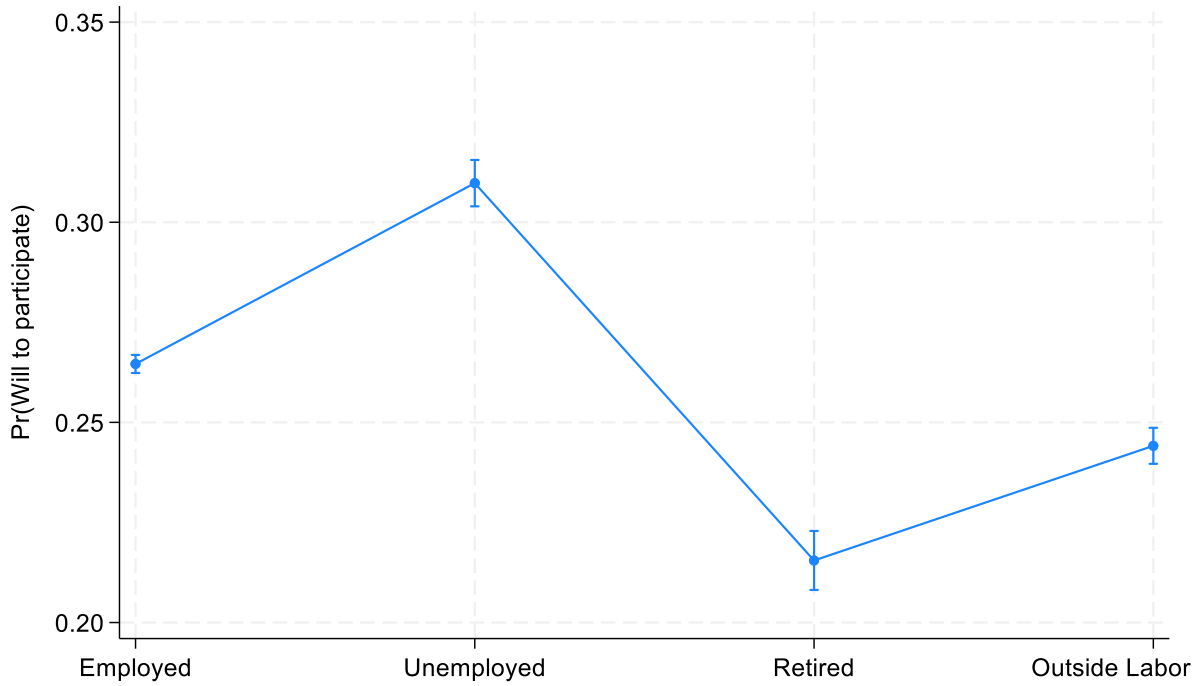


Figure 30. Predicted training willingness by employment status

2.2 ANALYSIS OF THE CVTS SURVEY

2.2.1 THE DATA AND FREQUENCIES

The following analysis is based on the Continuing Vocational Training Survey (CVTS) dataset that spans three survey waves—2010, 2015, and 2020—and covers a broad set of European countries, capturing trends in enterprise-level vocational training. The total number of observations has increased across waves, from 101,494 firms in 2010 to 113,284 firms in 2020, reflecting a more comprehensive sample over time.

The CVTS3 (2005) dataset was excluded because its classification of enterprises' principal economic activity is based on NACE Rev. 1.1 groups, whereas the classifications of the other three datasets rely on NACE Rev. 2 groups. To maintain consistency in classification and ensure comparability across the datasets, only those adhering to the NACE Rev. 2 framework were included in the analysis.

As shown in **Table 8**, among the most significant contributors, Italy consistently has the highest share of firms surveyed, making up 18.2% of the sample in 2010, slightly decreasing to 15.6% in 2020. Poland and France also have significant representation, with France's share increasing from 5.3% in 2010 to 7.6% in 2020.

The dataset also shows country-specific changes. Greece and Serbia, absent in earlier waves, are included in the 2020 survey with 1,536 and 4,697 firms, respectively. Meanwhile, the United Kingdom, which had 3,568 firms in 2010 and 3,315 in 2015, is entirely absent in 2020, likely reflecting Brexit-related changes in EU statistical participation. Similarly, Slovenia and Latvia were first included in 2015, maintaining stable participation in 2020.

The dataset also includes non-EU countries, with Norway consistently represented across all waves (~2% of the sample).

As an initial step, prior to analyzing key summary statistics, numerous observations were excluded based on established dataset validation rules. For instance, observations for the variable "Hours Worked per Employee" that exceeded 2,200 hours were eliminated—this decision aligned with data validation protocols to ensure the reliability and accuracy of the analysis.

The variable "Labour Costs (Direct + Indirect) per Employee" exhibited extreme values. To mitigate the impact of outliers, a threshold was set at the 95th percentile, and observations exceeding this threshold were excluded from the analysis. For the variable "Percentage of Employees Participating in CVT Courses," only enterprises offering CVT courses were included in the study. Moreover, observations with percentages exceeding 100% were excluded based on data validation rules, as participation cannot exceed the total number of employees within an enterprise.

Regarding the variable "Paid Working Time for CVT Courses per Employee (in hours)," only enterprises that provided CVT courses were considered. Additionally, observations were excluded if there was no record of the percentage of employees participating in CVT courses or if the reported CVT hours exceeded the total hours worked per employee, which was in line with established data validation rules.

Table 8: CVTS- Sample size

COUNTRY	2010		2015		2020	
	#Obs	(%)	#Obs	(%)	#Obs	(%)
All Countries	101,494	100.0%	110,843	100.0%	113,284	100.0%
Belgium	3,434	3.4%	4,509	4.1%	3,029	2.7%
Bulgaria	3,772	3.7%	3,949	3.6%	2,903	2.6%
Cyprus	922	0.9%	1,356	1.2%	1,208	1.1%
Czech Republic	7,789	7.7%	8,001	7.2%	7,132	6.3%
Denmark	1,242	1.2%	1,511	1.4%	1,616	1.4%
Estonia	2,185	2.2%	2,057	1.9%	1,589	1.4%
Finland	1,560	1.5%	1,579	1.4%	1,643	1.5%
France	5,411	5.3%	4,644	4.2%	8,598	7.6%
Germany	3,047	3.0%	2,846	2.6%	2,631	2.3%
Greece	0	0.0%	0	0.0%	1,536	1.4%
Hungary	5,125	5.1%	5,830	5.3%	6,715	5.9%
Italy	18,424	18.2%	18,130	16.4%	17,617	15.6%
Latvia	0	0.0%	2,721	2.5%	2,695	2.4%
Lithuania	4,075	4.0%	3,732	3.4%	3,807	3.4%
Luxembourg	1,254	1.2%	876	0.8%	1,206	1.1%
Malta	788	0.8%	972	0.9%	1,062	0.9%
Poland	14,027	13.8%	14,380	13.0%	12,508	11.0%
Portugal	3,888	3.8%	3,481	3.1%	3,955	3.5%
Romania	7,733	7.6%	8,148	7.4%	8,387	7.4%
Slovakia	2,042	2.0%	2,179	2.0%	2,387	2.1%
Slovenia	0	0.0%	1,691	1.5%	1,641	1.5%
Spain	6,667	6.6%	7,982	7.2%	8,485	7.5%
Sweden	2,014	2.0%	4,622	4.2%	3,954	3.5%
Non-EU						
Norway	2,527	2.5%	2,332	2.1%	2,283	2.0%
Serbia	0	0.0%	0	0.0%	4,697	4.2%
United Kingdom	3,568	3.5%	3,315	3.0%	0	0.0%

Summary statistics are shown in **Table 9** Small firms (10-49 employees) dominate across all industries, with the highest share in construction (89.5%) and the lowest in industry (75.0%). The construction industry exhibits the highest male employment share (87.1%), while service-oriented sectors have a more balanced gender distribution, with 48.5% male employees. Furthermore, labour costs vary significantly, with information and communication; financial and insurance activities

Table 9: Summary statistics of key variables by NACE classification (weighted statistics)

Variable	Industry		Construction		Wholesale and retail trade, transport, accommodation and food service activities		Information and communication; financial and insurance activities		Real estate activities; professional, scientific and technical activities; administrative and support service activities; arts, entertainment and recreation; other service activities	
	#Obs.	Mean	#Obs.	Mean	#Obs.	Mean	#Obs.	Mean	#Obs.	Mean
Size class: Small (10-49)	134,755	75.0%	28,422	89.5%	93,496	85.6%	30,925	75.4%	38,014	79.6%
“-“-: Medium (50-249)	134,755	20.3%	28,422	9.4%	93,496	12.3%	30,925	18.7%	38,014	16.9%
“-“-: Large (250+)	134,755	4.6%	28,422	1.1%	93,496	2.1%	30,925	5.9%	38,014	3.5%
Mean percentage of male employees	134,653	69.4	28,406	87.1	93,339	59.2	30,893	59.2	37,983	48.5
Mean hours worked per employee	132,417	1619.6	27,735	1596.7	91,504	1554.8	30,528	1624.9	37,239	1528.0
Mean labour costs (direct + indirect) per employee	130,065	27928.8	27,716	27706.7	90,587	23483.2	24,955	35003.6	36,011	26610.9
Provision of CVT courses	134,755	56.9%	28,429	56.7%	93,497	52.6%	30,926	71.9%	38,014	64.1%
Provision of other forms of CVT	134,755	54.7%	28,429	50.8%	93,497	52.3%	30,926	74.4%	38,014	65.1%
Mean percentage of employees participated in CVT courses *	78,096	46.5	16,882	48.8	50,258	46.4	22,870	54.4	23,013	50.0
Mean paid working time for CVT courses per employee (hours) *	77,911	9.3	16,854	10.1	50,191	9.5	22,846	16.2	22,937	13.5

Notes: *These variables are calculated based only on enterprises that provided CVT courses

sector having the highest average (€35,003.6 per employee) and Wholesale and retail trade, transport, accommodation and food service activities the lowest (€23,483.2 per employee).

Investment in Continuing Vocational Training (CVT) also differs by sector. 71.9% of Information and communication; financial and insurance activities firms offer CVT courses, the highest across industries, while only 52.6% of firms in wholesale and retail trade, transport, accommodation and food service activities provide structured training. Other forms of CVT, such as on-the-job training, are also most prevalent in Information and communication; financial and insurance activities firms (74.4%), suggesting a strong emphasis on workforce development. Among firms that provide training, the highest share of employees participating in CVT is in Information and communication; financial and insurance activities firms (54.4%), while wholesale and retail trade, transport, accommodation and food service activities firms train the fewest employees (46.4%). Similarly, the average paid training time per employee is highest in information and communication; financial and insurance activities firms (16.2 hours) and lowest in industry (9.3 hours).

At first glance, the data show that industries with higher labour costs and more knowledge-intensive activities tend to invest more in vocational training. In contrast, despite high male employment and working hours, sectors like construction allocate less time and resources to employee development. These trends highlight the varying importance of CVT across sectors, potentially influencing long-term productivity and workforce adaptability.

2.2.2 TRENDS IN PARTICIPATION RATES IN CVT PROVISION

This section explores the participation rates of enterprises in CVT provision, focusing on two main areas. The first is participation in organised CVT courses and the second the involvement in other forms of CVT such as guided on-the-job training, training at conferences, workshops, trade fairs and lectures, self-directed learning, job rotation, exchanges or secondments and learning/ quality circles.

Figure 31 provides an aggregate comparison, showing that 57.6% of enterprises across all surveyed countries offer formal CVT courses, while 56.6% engage in other forms of CVT. This suggests a nearly equal preference for structured training and alternative learning methods.

Table 10, presents an overview of CVT participation across European countries and type of training. Norway (86.1%) and Sweden (77.9%) have the highest rates of CVT course provision, while Greece (13.0%) and Romania (16.1%) exhibit the lowest participation in both training types. Other forms of CVT are most common in Latvia (98.3%), Norway (89%) and Sweden (82.9%). Interestingly, some countries, such as Czech Republic (78.2%) and France (69.5%), emphasize CVT courses more than informal training, while others, like Estonia (70.2%) and Germany (71.3%), rely more on alternative CVT methods.

These patterns reflect country-specific labour market policies, the availability of public training programs, and the importance of vocational education in workforce development.

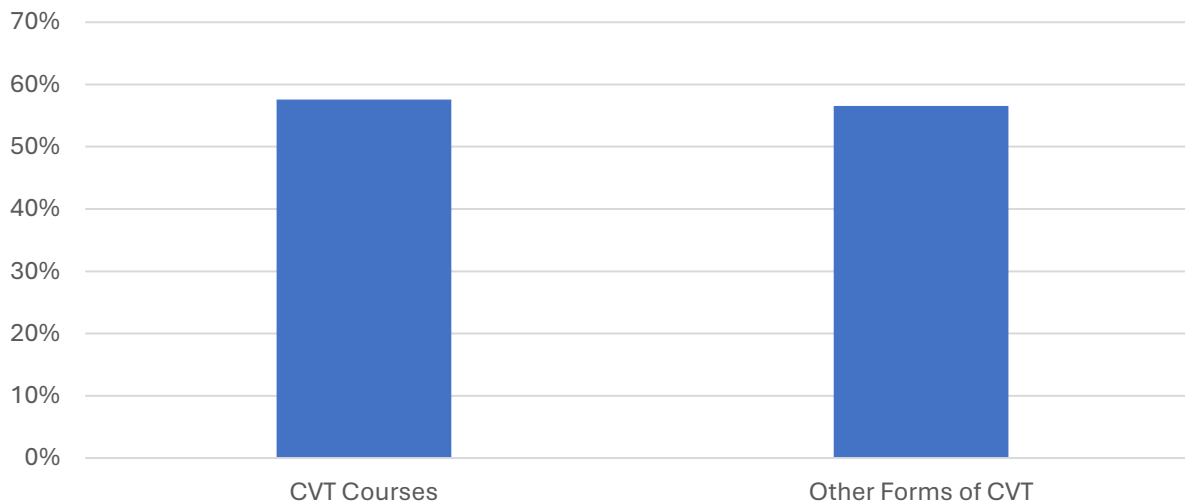


Figure 31. % Enterprises providing training by type of training (weighted)

Table 10: %Enterprises providing training by type of training and country (weighted)

COUNTRY	CVT COURSES	OTHER FORMS OF CVT
All Countries	57.6%	56.6%
Belgium	75.3%	67.2%
Bulgaria	26.1%	34.5%
Cyprus	49.7%	59.9%
Czech Republic	78.2%	46.0%
Denmark	63.3%	72.1%
Estonia	60.4%	70.2%
Finland	62.6%	55.8%
France	69.5%	51.8%
Germany	62.3%	71.3%
Greece	13.0%	14.8%
Hungary	30.8%	35.9%
Italy	52.7%	45.4%
Latvia	32.5%	98.3%
Lithuania	40.7%	49.9%
Luxembourg	68.9%	65.3%
Malta	35.6%	50.6%
Poland	25.4%	31.1%
Portugal	50.3%	63.6%
Romania	16.1%	19.1%
Slovakia	55.5%	56.4%
Slovenia	64.7%	76.7%
Spain	72.0%	57.8%
Sweden	77.9%	82.9%
Non-EU		
Norway	86.1%	89.0%
Serbia	40.8%	42.4%
United Kingdom	63.7%	77.8%

The trend data in **Table 11** reveals fluctuations in enterprise training participation over the past decade. Between 2010 and 2015, the provision of CVT courses increased from 56.1% to 61.8%, reflecting a period of expanded workforce development initiatives. However, in 2020, participation dropped to 54.7%, possibly due to disruptions caused by the COVID-19 pandemic, economic downturns, or shifts in training strategies. Similarly, other forms of CVT saw a rise from 52.6% in 2010 to 60.2% in 2015, before settling at 56.8% in 2020.

Table 11: %Enterprises providing training by type of training and wave (weighted)

TYPE	2010	2015	2020
CVT Courses	56.1%	61.8%	54.7%
Other Forms of CVT	52.6%	60.2%	56.8%

2.2.2.1 DIFFERENCES IN PARTICIPATION RATES IN CVT PROVISION BY TYPE SIZE CLASS

Figure 32 illustrates the trends in enterprise participation in CVT across waves, segmented by firm size. It captures CVT courses and other forms of CVT, highlighting how training provision has evolved over the past decade.

Large firms (250+ employees) consistently exhibit the highest participation rates across all years and training types, maintaining close to 90% engagement levels. However, participation peaked in 2015 before experiencing a slight decline in 2020, potentially reflecting shifts in training strategies or economic constraints. Medium-sized firms (50-249 employees) show moderate training participation, with CVT course provision peaking as before, around 2015, before slightly declining in 2020. Their engagement in other forms of CVT follows a similar trend, indicating a balanced approach to structured and informal training. Finally, small firms (10-49 employees) consistently report the lowest training participation rates, though they also experienced an increase in 2015, followed by a drop in 2020. This suggests that smaller enterprises may face challenges sustaining training investments, particularly during economic disruptions like the COVID-19 pandemic. A detailed presentation of the calculated figures is available in **Table 33** in the appendix.

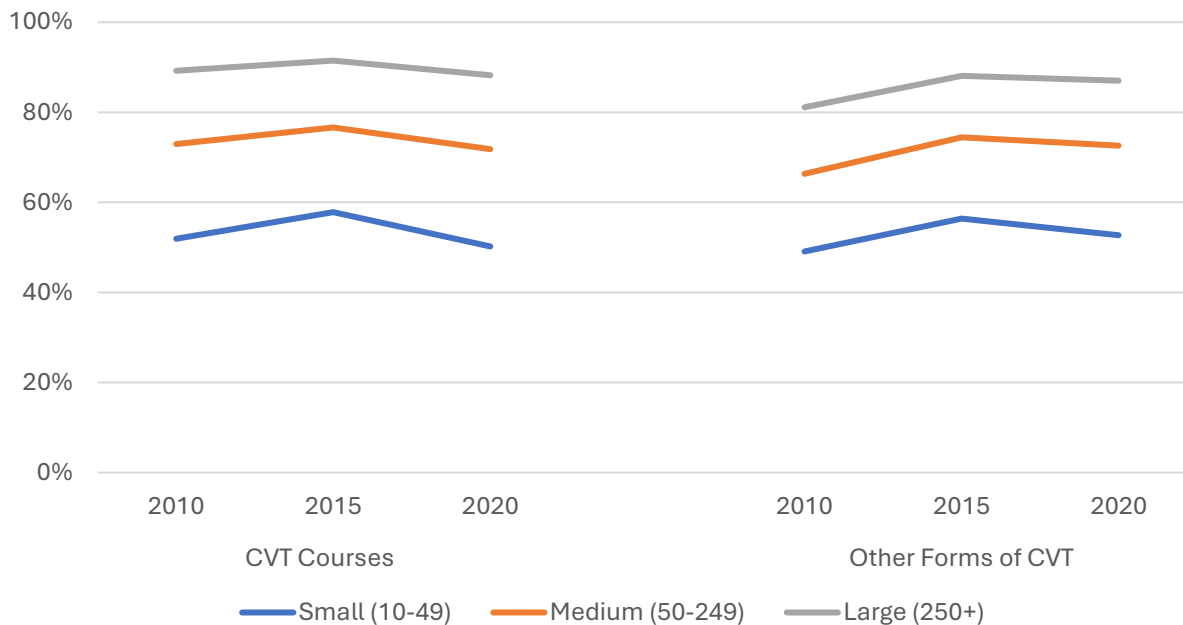


Figure 32. % Enterprises providing training by type of training, year and size (weighted)

2.2.2.2 DIFFERENCES IN PARTICIPATION RATES IN CVT PROVISION BY NACE REV.2 ACTIVITY

Figure 33 presents trends in CVT participation across different industries from 2010 to 2020, distinguishing between CVT courses and other forms of CVT (such as on-the-job training).

Information and communication; financial and insurance activities had the highest training participation rates across all years, with CVT course provision exceeding 75% in 2015 before slightly declining in 2020. Their engagement in other forms of CVT also remained strong, reflecting the high skill demands of these knowledge-intensive industries. Real estate, professional, scientific, and technical activities, administrative and support services, and arts and entertainment also consistently maintained high participation, mirroring trends in financial and technical sectors where workforce skills need constant updating. The industry sector followed a similar pattern, with moderate CVT courses participation, peaking in 2015 and experiencing a slight decline in 2020. However, participation in other forms of CVT showed a steady increase over the years.

Construction and Wholesale and retail trade, transport, accommodation and food service activities firms exhibited the lowest engagement in CVT courses and other training methods, possibly due to higher employee turnover rates and lower incentives for skill development in these industries.

Calculated figures are provided in **Table 34** in the appendix.

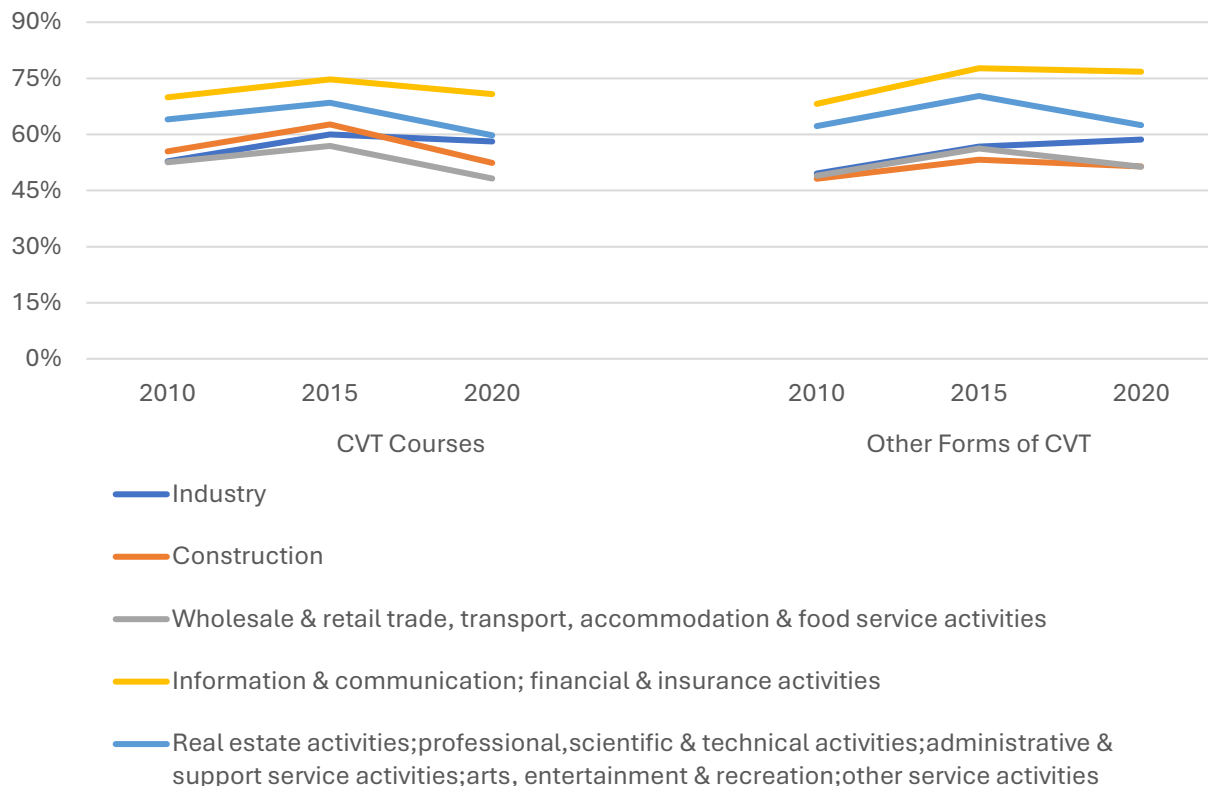


Figure 33. % Enterprises providing training by type of training, year and NACE Rev.2 activity (weighted)

2.2.3 TRENDS IN PARTICIPATION RATES IN CVT COURSES PROVISION

The following section analyses the provision of CVT courses by the enterprises, distinguishing between two distinct types. The first type, internal CVT courses, are designed and managed by the enterprise, leveraging in-house resources and expertise. The second type, external CVT courses, are developed and delivered by third-party organisations. These may include higher education institutions, public training institutions, private training companies, employers’ associations and trade unions.

Figure 34 shows the proportion of firms providing internal or external CVT courses. The bars show an increased preference in external CVT courses. Firms may prefer external training providers likely because they offer specialized expertise, certification programs, and flexibility that internal training might lack. On the other hand, internal training, while still significant, is less widely adopted, possibly due to resource constraints, the cost of developing in-house training programs, or the need for diverse skill sets that external providers can better address.

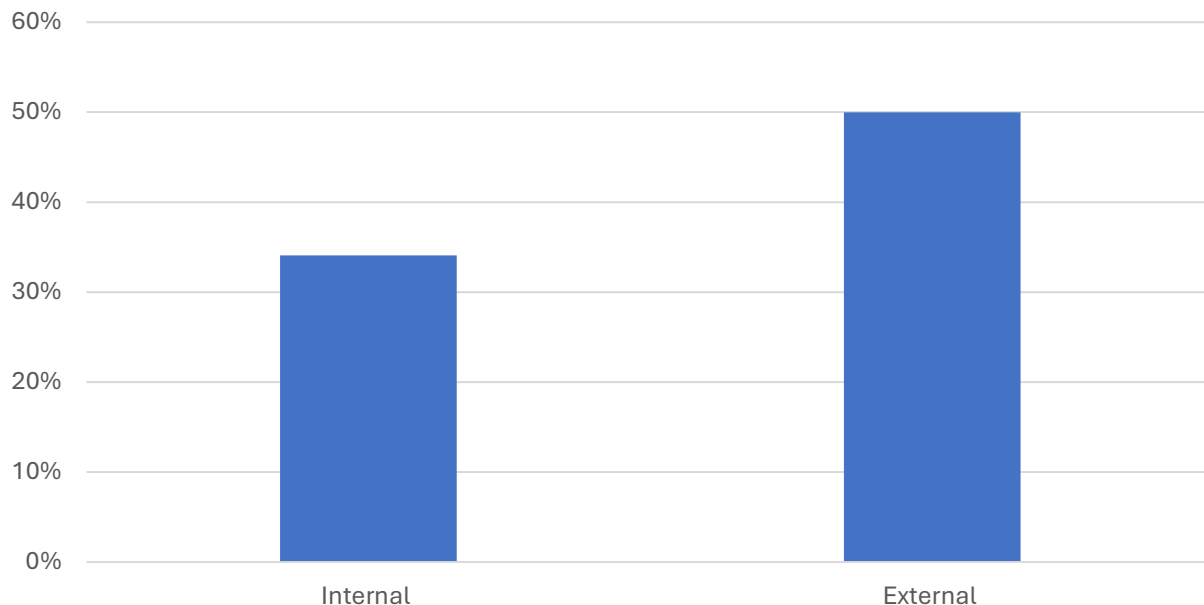


Figure 34. % Enterprises providing Internal or External CVT Courses (weighted)

Table 12 presents the percentage of enterprises providing internal and external Continuing Vocational Training (CVT) courses across European countries, highlighting significant variations in training strategies. Overall, 50.0% of enterprises opt for external training providers, while 34.1% conduct internal training, indicating a general preference for outsourced training. Sweden (70.7%) and Norway (69.3%) have the highest rates of external training, whereas Greece (8.8%) and Romania (10.9%) report the lowest, indicating potential barriers such as financial constraints, lack of training incentives, or limited access to training providers. Conversely, Norway (70.8%) leads in internal training, followed by Sweden (59.3%) and Luxembourg (51.2%), reflecting a strong emphasis on in-house skill development.

Countries such as Germany (47.1% internal, 54.6% external) and Luxembourg (51.2% internal, 58.8% external) demonstrate a balanced approach, investing in both firm-specific knowledge and external expertise. On the other hand, Spain (22.3% internal, 67.9% external) and France (36.5% internal, 63.1% external) rely more on outsourced training, suggesting that firms in these countries prefer third-party professional training services.

Table 13 illustrates the trends in internal and external Continuing Vocational Training (CVT) provision among enterprises across waves, revealing fluctuations in training strategies over time. External training has consistently been more common than internal training, with 48.4% of firms outsourcing CVT in 2010, peaking at 55.1% in 2015, before dropping to 46.3% in 2020. This decline may be linked to economic uncertainties, shifts in training preferences, or the impact of the COVID-19 pandemic, which likely disrupted traditional external training formats.

Table 12: %Enterprises providing Internal or External CVT Courses by country (weighted)

COUNTRY	INTERNAL	EXTERNAL
All Countries	34.1%	50.0%
Belgium	50.7%	63.5%
Bulgaria	17.8%	17.8%
Cyprus	27.4%	44.9%
Czech Republic	41.4%	66.6%
Denmark	41.0%	51.0%
Estonia	36.2%	55.2%
Finland	31.1%	59.0%
France	36.5%	63.1%
Germany	47.1%	54.6%
Greece	4.9%	8.8%
Hungary	15.7%	26.6%
Italy	29.6%	42.7%
Latvia	19.6%	25.0%
Lithuania	21.2%	36.4%
Luxembourg	51.2%	58.8%
Malta	25.1%	27.7%
Poland	16.2%	21.8%
Portugal	28.0%	42.3%
Romania	9.0%	10.9%
Slovakia	33.4%	48.9%
Slovenia	42.9%	56.1%
Spain	22.3%	67.9%
Sweden	59.3%	70.7%
Non-EU		
Norway	70.8%	69.3%
Serbia	26.8%	31.3%
United Kingdom	40.8%	53.1%

On the other hand, internal training participation increased from 30.9% in 2010 to 36.2% in 2015, before slightly declining to 35.0% in 2020. While internal training remained relatively stable, the drop in external training in 2020 suggests that enterprises may have shifted towards more cost-effective, in-house training solutions. The 2015 peak in internal and external training participation indicates a period of expanded workforce development efforts, potentially driven by policy initiatives or increased employer investment in skills development.

Table 13: %Enterprises providing Internal/External CVT Courses by year (weighted)

TYPE	2010	2015	2020
Internal	30.9%	36.2%	35.0%
External	48.4%	55.1%	46.3%

2.2.3.1 DIFFERENCES IN PARTICIPATION RATES IN CVT COURSES BY FIRM SIZE

Figure 35, shows the trend by firm size and results follow the previous analysis. Large firms consistently have the highest participation rates in internal and external training, peaking in 2015 before experiencing a slight decline in 2020. Medium-sized firms follow a similar trend, showing stable but lower engagement than large firms. Small firms have the lowest training participation, with external training peaking in 2015 before dropping in 2020, likely due to financial constraints or economic disruptions. A detailed presentation of the calculated figures is available in **Table 35** in the appendix.

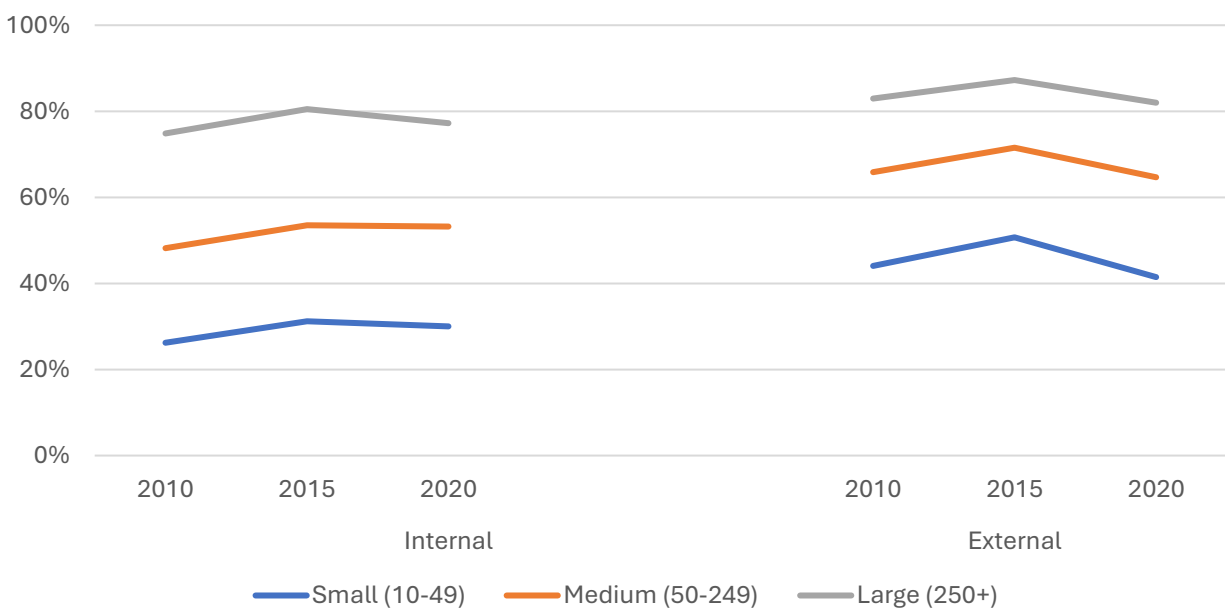


Figure 35. % Enterprises providing Internal/External CVT Courses by year and size (weighted)

2.2.3.2 DIFFERENCES IN PARTICIPATION RATES IN CVT COURSES PROVISION BY NACE REV.2 ACTIVITY

Figure 36 illustrates participation rates in CVT courses by NACE REV.2 activity. The information and communication; financial and insurance activities sector show the highest training participation, particularly in external CVT, reflecting the industry's emphasis on specialized skill development. In contrast, construction and Wholesale and retail trade, transport, accommodation and food service activities exhibit the lowest training engagement, suggesting greater barriers to workforce training investment. The decline in 2020 across most industries may indicate budgetary constraints or a shift

towards alternative learning methods such as digital training and informal learning. The appendix (Table 36) contains the calculated figures.

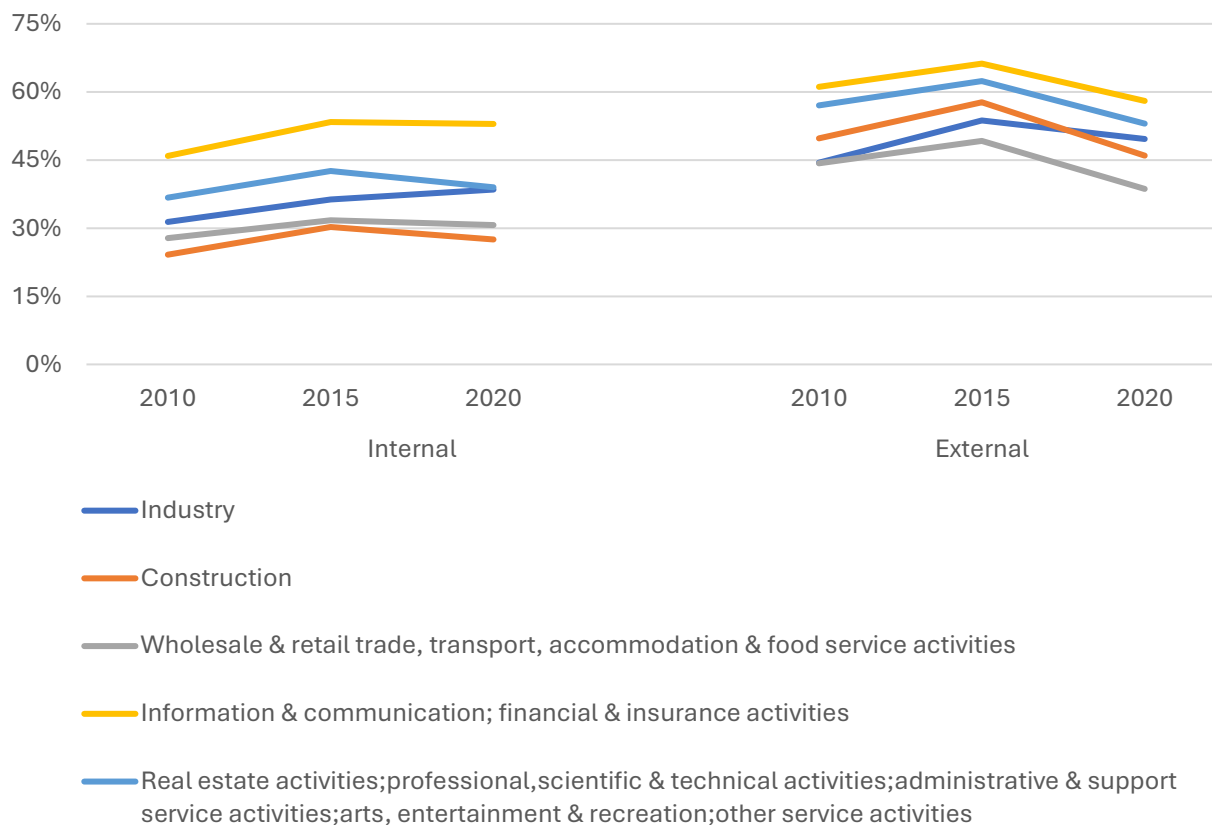


Figure 36. % Enterprises providing Internal/External CVT Courses by year and NACE Rev.2 (weighted)

2.2.4 TRENDS IN PARTICIPATION RATES IN OTHER FORMS OF CVT PROVISION

This section focuses on the provision of other forms of CVT by enterprises, identifying five distinct types. These forms of training are often characterised by a degree of self-organisation by individual learner or groups. The identified types include guided on-the-job training, training at conferences, workshops, trade fairs and lectures, self-directed learning, job rotation, exchanges or secondments and learning/ quality circles.

Figure 37 presents the distribution of the various forms of non-formal Continuing Vocational Training (CVT) provided by enterprises. Guided on-the-job training is the most common method, with nearly 45% of firms utilizing it, highlighting its effectiveness in practical skill development. Training at conferences, workshops, and trade fairs follows closely, suggesting enterprises value external knowledge-sharing opportunities. Self-directed learning is moderately used, while job rotation and learning circles have the lowest participation rates, indicating that structured workplace learning

initiatives are less commonly implemented. These trends suggest a strong preference for hands-on, experience-based training over structured internal learning programs.

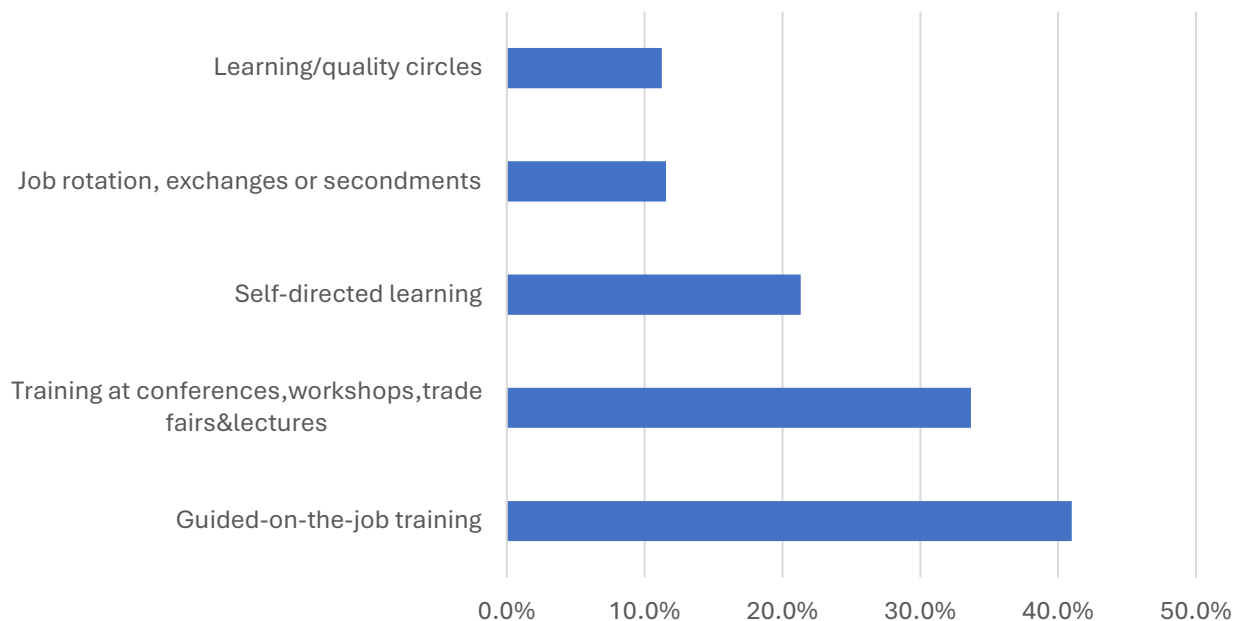


Figure 37. % Enterprises providing other forms of CVT (weighted)

Table 14 highlights the variation in enterprise participation in different types of non-formal CVT across countries, showing a clear preference for guided on-the-job training, the most common form of training in most countries (41.0% overall). Latvia (98.3%), Sweden (65.7%), and Norway (69.8%) report the highest engagement in on-the-job training, whereas Greece (10.5%) and Romania (10.3%) show the lowest levels. Training at conferences, workshops, and trade fairs is also widely adopted, particularly in Germany (54.9%) and Sweden (52.0%), indicating a strong emphasis on external knowledge acquisition.

Self-directed learning, while moderately popular across countries (21.3% overall), sees the highest participation in Norway (43.3%) and Sweden (41.1%), suggesting that employees in these countries may have more autonomy in skill development. Job rotation and exchanges remain the least common training methods, with only 11.6% of enterprises implementing them overall, though Sweden (34.8%) and Norway (29.2%) show significantly higher engagement. Learning/quality circles, another less common method (11.3% overall), are notably used in Norway (24.7%) and Cyprus (23.3%), suggesting a cultural emphasis on collaborative and continuous learning environments in these countries.

The data reflects regional disparities in training strategies, with Northern and Western European countries investing more in diverse training formats. In contrast, Southern and Eastern European countries lag in participation, particularly in structured and collaborative learning methods.

Table 14: %Enterprises providing Other Forms of CVT by type and country (weighted)

COUNTRY	GUIDED ON-THE-JOB TRAINING	TRAINING AT CONFERENCES, WORKSHOPS, TRADE FAIRS AND LECTURES	SELF - DIRECTED LEARNING	JOB ROTATION, EXCHANGES OR SECONDMENTS	LEARNING/ QUALITY CIRCLES
All Countries	41.0%	33.7%	21.3%	11.6%	11.3%
Belgium	47.6%	41.8%	26.1%	16.1%	17.1%
Bulgaria	26.7%	15.6%	10.3%	7.6%	11.2%
Cyprus	42.0%	31.6%	18.4%	10.2%	23.3%
Czech Republic	31.9%	26.7%	15.4%	4.9%	4.2%
Denmark	47.8%	50.7%	31.0%	13.0%	16.8%
Estonia	53.2%	33.4%	24.3%	14.6%	6.8%
Finland	37.6%	40.1%	30.9%	13.9%	14.1%
France	29.1%	24.1%	15.8%	12.2%	11.8%
Germany	57.7%	54.9%	29.0%	9.2%	15.9%
Greece	10.5%	5.0%	6.2%	1.3%	4.4%
Hungary	20.8%	24.3%	10.7%	3.4%	5.0%
Italy	30.0%	25.7%	15.1%	11.3%	4.7%
Latvia	98.3%	26.3%	16.6%	10.6%	9.8%
Lithuania	31.6%	36.6%	21.3%	3.3%	19.4%
Luxembourg	48.4%	44.2%	27.8%	20.9%	20.5%
Malta	39.6%	27.7%	18.2%	13.2%	12.3%
Poland	23.6%	17.7%	9.1%	8.2%	2.4%
Portugal	52.5%	30.4%	16.7%	8.2%	14.5%
Romania	10.3%	7.8%	9.3%	3.9%	3.1%
Slovakia	32.5%	37.6%	25.8%	11.0%	18.9%
Slovenia	60.3%	49.1%	28.1%	14.1%	18.6%
Spain	41.0%	23.7%	23.7%	10.8%	13.9%
Sweden	65.7%	52.0%	41.1%	34.8%	8.1%
Non-EU					
Norway	69.8%	45.3%	43.3%	29.2%	24.7%
Serbia	28.5%	21.5%	26.5%	10.9%	11.8%
United Kingdom	61.1%	49.8%	30.1%	17.1%	15.0%

Table 15 presents the evolution of non-formal CVT methods from 2010 to 2020, showing significant shifts in training preferences among enterprises. Guided on-the-job training remains the most widely used method, increasing from 35.0% in 2010 to 45.0% in 2015 before slightly declining to 42.8% in 2020, suggesting its sustained relevance in practical skill development.

A notable trend is the steady rise in self-directed learning, which more than doubled from 14.2% in 2010 to 28.5% in 2020. This indicates a growing emphasis on autonomous learning and digital education, possibly driven by technological advancements and the expansion of e-learning platforms. Conversely, training at conferences, workshops, and trade fairs, which peaked at 38.6% in 2015, saw a decline to 28.6% in 2020, likely due to pandemic-related disruptions and a shift toward virtual learning formats.

More structured workplace learning methods, such as job rotation and learning/quality circles, have remained less prevalent but are gradually increasing. Learning/quality circles grew from 9.1% in 2010 to 13.0% in 2020, reflecting enterprises' slow adoption of collaborative learning and problem-solving approaches.

These trends suggest a shift toward more flexible and self-driven learning approaches. At the same time, traditional external training formats face declining participation, possibly due to cost considerations, digitalization, and changes in workforce training needs.

Table 15: %Enterprises providing Other Forms of CVT by year (weighted)

TYPE	2010	2015	2020
Guided-on-the-job training	35.0%	45.0%	42.8%
Training at conferences, workshops, trade fairs and lectures	33.7%	38.6%	28.6%
Self-directed learning	14.2%	21.3%	28.5%
Job rotation, exchanges or secondments	9.9%	12.4%	12.4%
Learning/quality circles	9.1%	11.7%	13.0%

2.2.4.1 DIFFERENCES IN PARTICIPATION RATES IN OTHER FORMS OF CVT PROVISION BY TYPE SIZE CLASS

Figure 38 illustrates the evolution of non-formal CVT methods across different firm sizes (small, medium, and large enterprises) from 2010 to 2020, highlighting disparities in training adoption. Larger enterprises consistently report the highest participation rates across all training types, reflecting their greater capacity to invest in diverse training programs. Guided-on-the-job training and training at conferences, workshops, and trade fairs peaked in 2015, before slightly declining in 2020, particularly among smaller firms. This suggests that economic constraints or shifts in training preferences may have influenced participation.

Conversely, self-directed learning has grown steadily across all firm sizes, with large enterprises experiencing the most significant increase, indicating a rising emphasis on autonomous and digital learning formats. Job rotation, exchanges, and learning/quality circles remain less common overall

but have gradually increased, particularly in larger firms, which may have more structured workforce development programs.

The data suggests that larger firms engage more in diverse training methods. At the same time, small and medium-sized enterprises (SMEs) show more fluctuations, likely due to budgetary constraints and access to training resources. The rise in self-directed learning and quality circles also signals a gradual shift towards more flexible, employee-driven learning models, particularly in industries that require continuous skill adaptation. **Table 37** in the appendix presents calculated figures in detail.

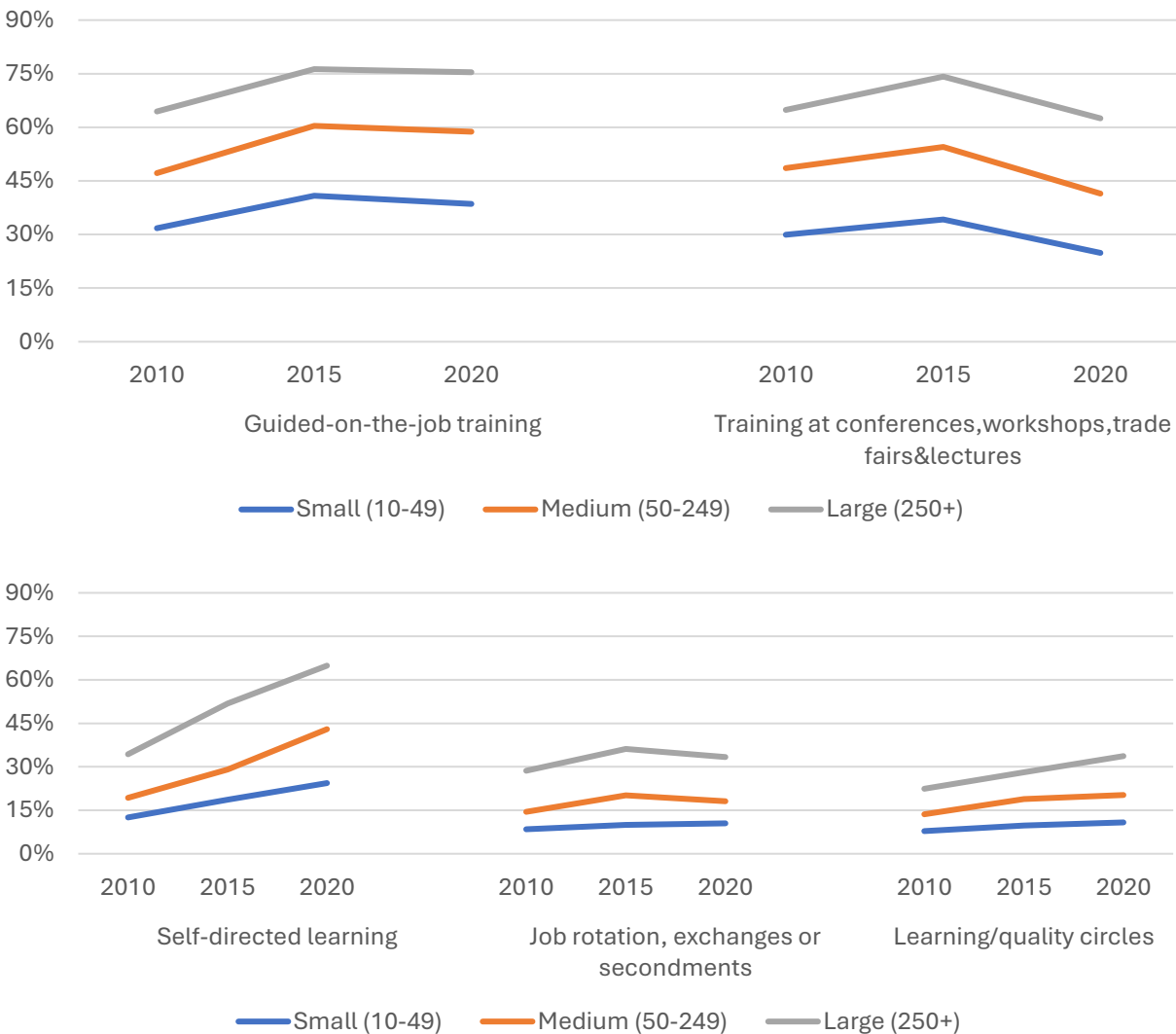


Figure 38. % Enterprises providing other forms of CVT by year and size (weighted)

2.2.4.2 DIFFERENCES IN PARTICIPATION RATES IN OTHER FORMS OF CVT PROVISION BY NACE REV.2 ACTIVITY

Figure 39 illustrates the evolution of non-formal CVT methods across different industries from 2010 to 2020, highlighting distinct sectoral preferences for training approaches. Guided-on-the-job training and training at conferences, workshops, and trade fairs peaked in 2015 before experiencing a decline in 2020, particularly in sectors like real estate activities, professional, scientific, and technical activities, administrative and support service activities, arts, entertainment and recreation, other service activities, wholesale and retail trade, transport, accommodation, and food service activities.

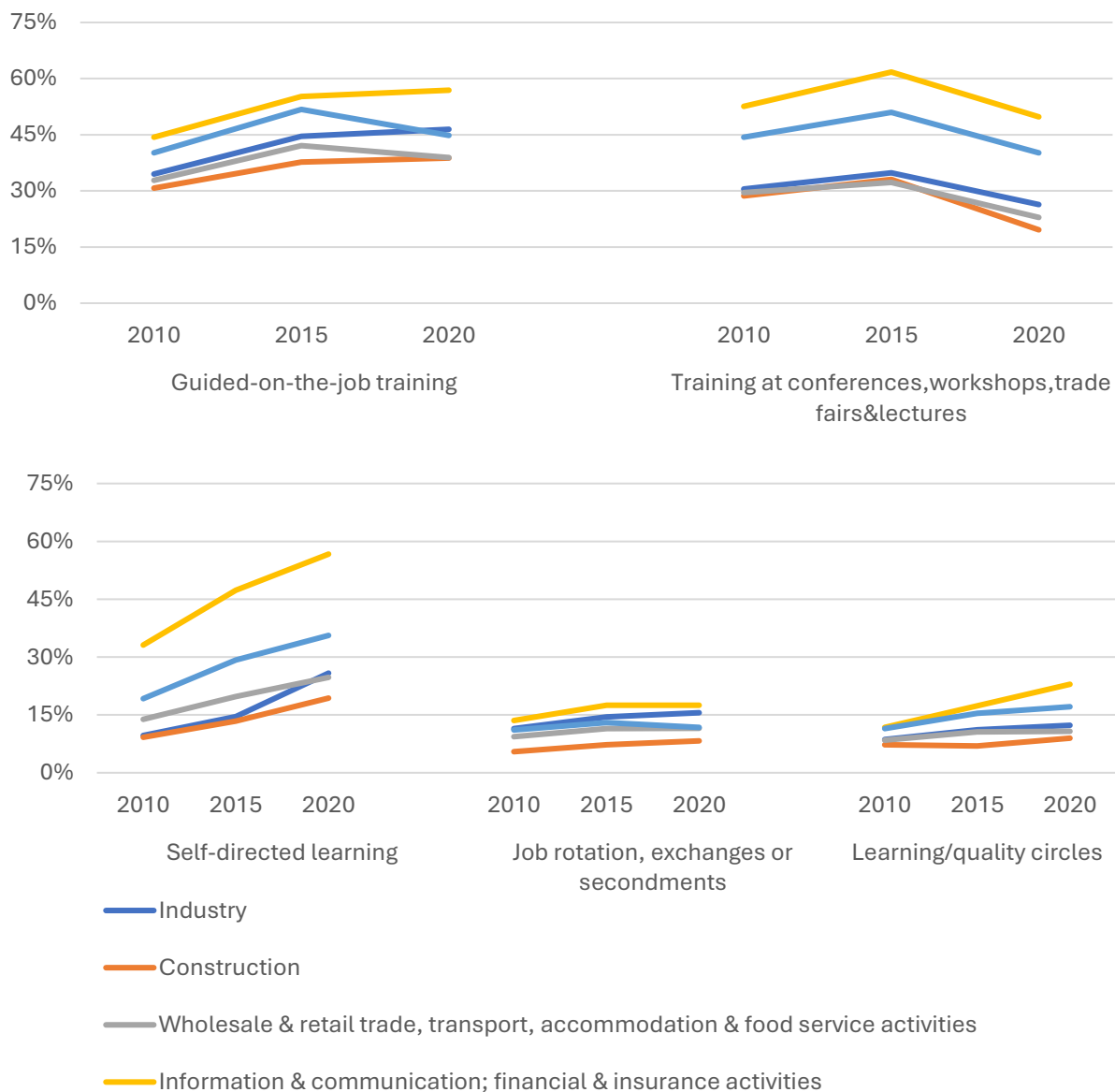


Figure 39. % Enterprises providing other forms of CVT by year and NACE Rev.2 (weighted)

A notable increase in self-directed learning is evident across all industries, with the information and communication; financial and insurance sector showing the sharpest rise, reflecting the growing importance of autonomous learning and digital skill development. Meanwhile, job rotation and learning/quality circles remain less common but have shown gradual increases, particularly in knowledge-intensive industries where collaborative and experiential learning play a crucial role.

Overall, the data suggests that industries with higher knowledge demands (e.g., finance, IT, and professional services) invest more in diverse training methods, while traditional sectors (e.g., construction, retail) show lower participation rates, possibly due to cost barriers or reliance on informal skill acquisition. The decline in external training participation in 2020 across several industries further indicates a potential shift toward internal or digital training solutions, influenced by economic and technological changes. A detailed presentation of the calculated figures is available in **Table 38** in the appendix.

2.2.5 BARRIERS TO THE PROVISION OF CVT ACTIVITIES IN ENTERPRISES

2.2.5.1 FACTORS LIMITING THE PROVISION OF CVT ACTIVITIES IN ENTERPRISES THAT HAVE PROVIDED CVT TRAINING

2.2.5.1.1 FACTORS LIMITING PROVISION

For the following analysis, the responses that selected the “no answer” choice were excluded from the sample. **Figure 40** presents the main barriers to providing CVT among enterprises. The most common reasons for not engaging in CVT include no perceived need for training (50%), as firms believe their employees' skills are already sufficient, and time constraints due to high workload (over 40%). High CVT costs are another significant factor, indicating financial barriers to training investment. Meanwhile, some firms cite recent major CVT efforts (around 25%), suggesting they may temporarily halt new training initiatives. Less frequently mentioned barriers include difficulty in assessing training needs and a lack of suitable CVT courses in the market, which may point to gaps in training availability or relevance. These insights highlight the need for targeted policies to address cost, time, and perceived necessity challenges in workforce upskilling.

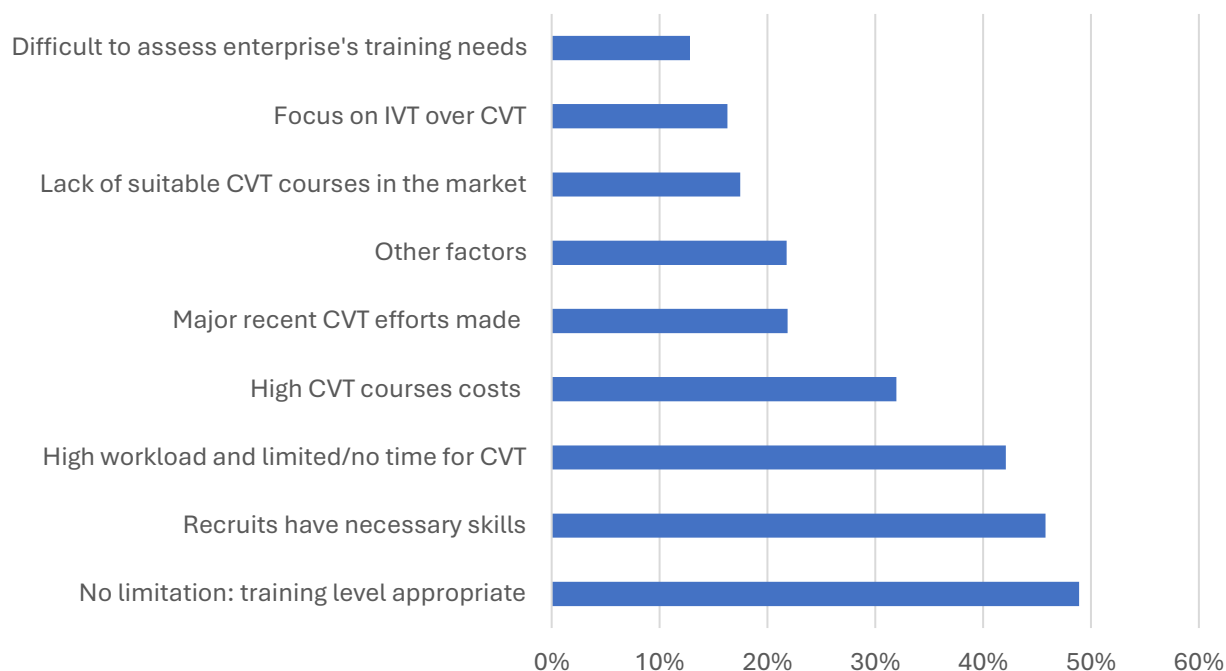


Figure 40. Factors limiting provision of CVT activities for enterprises provided CVT training

2.2.5.1.2 FACTORS LIMITING TRAINING PROVISION OVER TIME (2010-2020)

Figure 41 illustrates the evolution of barriers to CVT provision from 2010 to 2020, highlighting shifts in enterprise concerns. The most cited reason across all years is no perceived need for training, with around 50% of enterprises consistently believing that their employees’ skills are sufficient. The high workload and lack of time for CVT remain other key barriers, though they have remained relatively stable. High CVT costs have slightly decreased since 2010, possibly indicating greater access to cost-effective training solutions or increased public funding support.

Some barriers, such as difficulty assessing training needs and lack of suitable CVT courses, have remained minor concerns. At the same time "other factors" saw an unusual spike in 2010, suggesting an unidentified external influence. Overall, the data suggests that while cost and time constraints remain persistent issues, enterprises' perception of training necessity remains the most significant factor influencing CVT participation. Addressing these challenges may require greater awareness initiatives, tailored CVT programs, and financial incentives to encourage firms to invest in workforce upskilling. Calculated figures are provided in **Table 39** in the appendix.

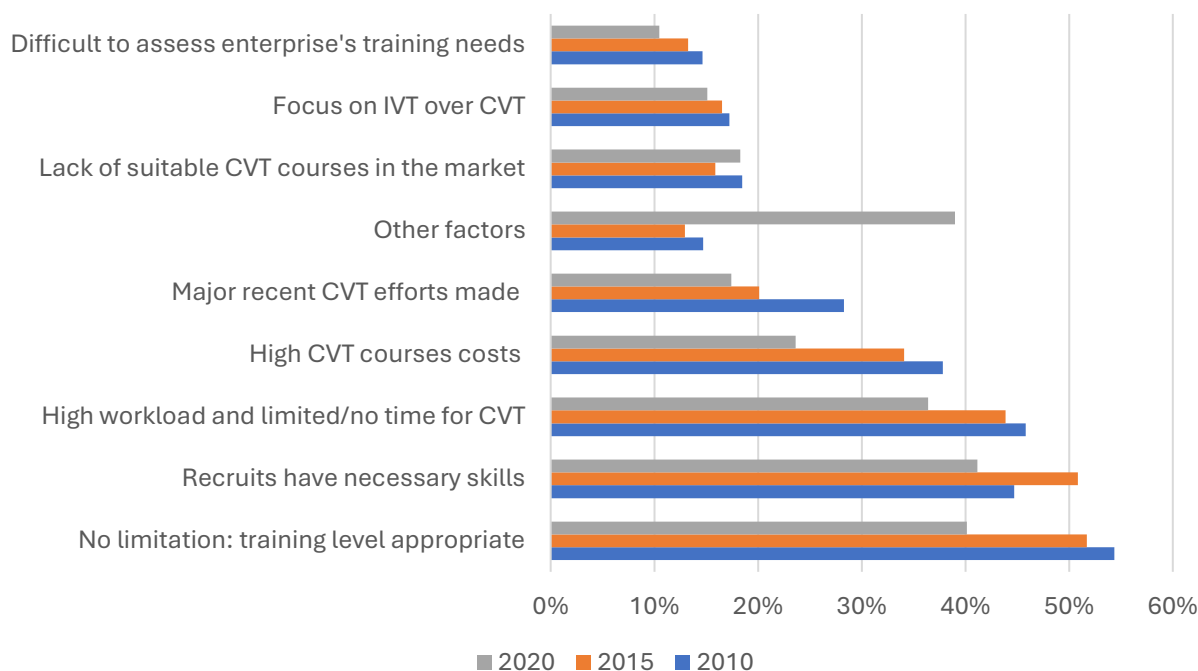


Figure 41. Factors limiting provision of CVT activities over time (2010–2020)

2.2.5.1.3 FACTORS LIMITING TRAINING ACTIVITY PROVISION BY FIRM SIZE AND INDUSTRIES (2010–2020)

Figure 42 and **Figure 43** illustrate trends in the main barriers to CVT participation among across different firm sizes and industries from 2010 to 2020. Across all categories, the most cited reason for not providing CVT is no perceived need for training, which has declined over time, suggesting an increasing recognition of workforce development. Similarly, the belief that recruits already have the necessary skills peaked in 2015 before declining in 2020, indicating that firms may be reassessing their skill gaps.

Time constraints due to high workload remain a persistent issue, with similar participation rates across all firm sizes. Financial barriers, such as high CVT course costs, have steadily decreased, suggesting that training has become more accessible or that firms are allocating resources differently. Interestingly, the "other factors" category saw a significant increase in 2020, particularly among large firms, which may indicate new challenges such as digital transformation, COVID-19 disruptions, or regulatory changes affecting training decisions.

Smaller firms consistently report higher concerns about the lack of suitable CVT courses and difficulties in assessing training needs, highlighting the need for more tailored and accessible training options for SMEs. The slight decline in the focus on Initial Vocational Training (IVT) over CVT suggests that firms recognise the importance of continuous skill development beyond initial education. The data reflects shifting perceptions of training needs and evolving challenges in workforce development across different enterprise sizes.



Figure 42. Size class disparities in factors limiting the provision of CVT activities among enterprises provided CVT training (2010-2020)



Figure 43. Economic activity disparities in factors limiting the provision of CVT activities among enterprises provided CVT training (2010-2020)

Across industries, wholesale and retail trade, transport, accommodation and food service activities sectors exhibit a noticeable decline in factors like no perceived need for training from 54.2% in 2010 to 37.5% in 2020, indicating increasing skill gaps or training needs in this sector.

Firms from information and communication; financial and insurance activities sector report consistently difficulty from high workload and limited/no time for CVT, with less improvement than other sectors. Construction and information and communication; financial and insurance activities sectors increased the reporting of “Focus on IVT over CVT” by 2020, suggesting a shift towards skills development at entry level over continuing training of the employees. On the other hand, the other three sectors show a decline in reporting the same factor, recognising the importance of continuous skill development beyond initial education. **Table 40** and **Table 41** in appendix present calculated figures in detail.

2.2.5.2 REASONS FOR THE NON-PROVISION OF CVT ACTIVITIES IN ENTERPRISES THAT DID NOT PROVIDE CVT TRAINING

2.2.5.2.1 REASONS FOR THE NON-PROVISION

Figure 44 presents the primary reasons why enterprises did not provide Continuing Vocational Training (CVT), excluding responses where no answer was given. Nearly 80% of firms reported that existing employee skills meet enterprise needs, indicating that many companies do not perceive an urgent need for workforce training. Additionally, around 50% of firms stated that recruits already possess the necessary skills, reducing the demand for CVT.

Other notable barriers include high workload and lack of time for training, which affect about 30% of enterprises, and high CVT course costs, which remain a concern for many organizations. Factors such as difficulty assessing training needs, a lack of suitable CVT courses, and a focus on Initial Vocational Training (IVT) over CVT are cited less frequently, suggesting that these are secondary obstacles. A small proportion of firms reported significant recent CVT efforts as a reason for not conducting additional training, implying that some enterprises may operate on a cyclical training schedule rather than offering continuous training. These findings highlight that while financial and time constraints are relevant barriers, the most significant challenge is changing enterprises' perception of the necessity of constant training, which may require greater awareness efforts and incentives for long-term workforce development.

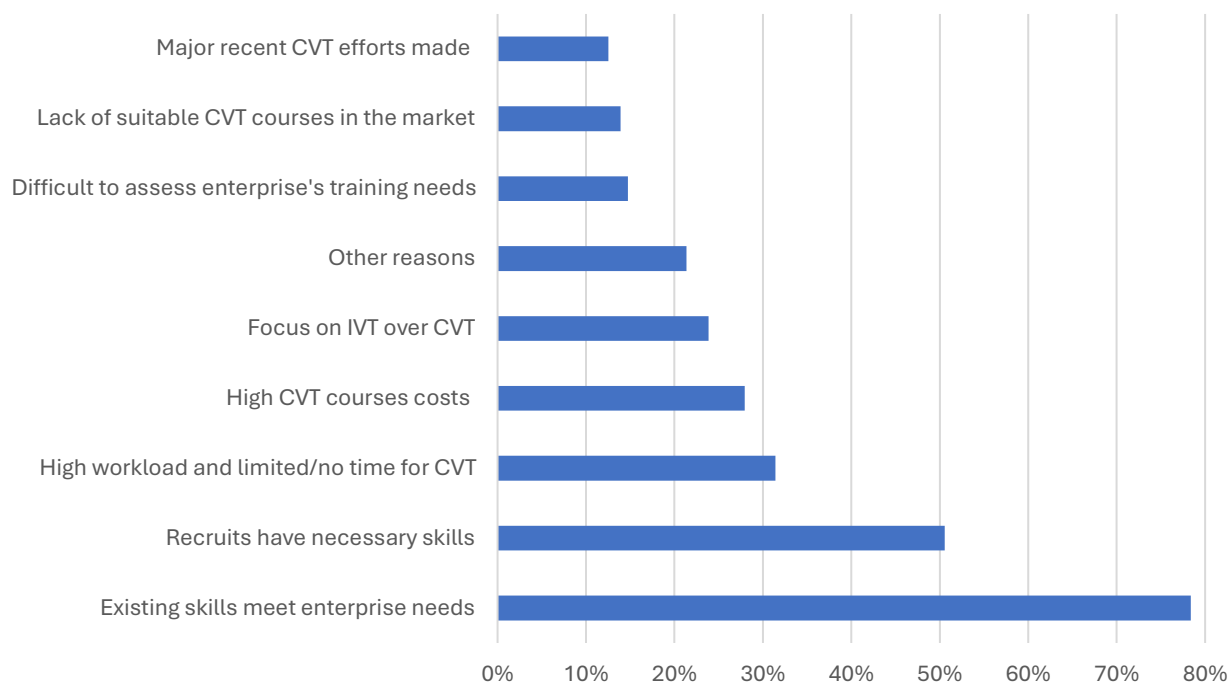


Figure 44. Reasons for the non-provision of CVT activities for enterprises that did not provide CVT training

2.2.5.2.2 REASONS FOR THE NON-PROVISION OVER TIME (2010-2020)

Figure 45 illustrates the evolution of reasons why enterprises did not provide CVT from 2010 to 2020, highlighting consistent trends and shifting barriers over time. The most dominant reason remains the belief that existing skills meet enterprise needs, with nearly 80% of firms citing this as a justification across all years, suggesting a persistent perception that additional training is unnecessary.

Similarly, the share of firms stating that recruits already have the necessary skills has remained relatively stable. However, it slightly declined in 2020, potentially indicating growing recognition of skill gaps in new hires. High workload and time constraints continue to be a significant barrier, while concerns about high CVT costs have gradually decreased, suggesting that financial barriers may be becoming less of a concern over time.

Other obstacles, such as lack of suitable CVT courses, difficulty assessing training needs, and a preference for Initial Vocational Training (IVT) over CVT, have shown only minor fluctuations, indicating that they remain secondary concerns for most firms. Notably, the "Other reasons" category spiked in 2010, suggesting unidentified external factors influenced training decisions during that period.

Overall, the data suggests that the main challenge in increasing CVT participation is not necessarily cost or access but changing enterprises' perception of the need for continuous workforce development. Addressing this perceived lack of necessity may require awareness campaigns, policy

incentives, or strategic skill development initiatives to encourage firms to invest in ongoing training. Calculated figures are provided in **Table 42** at the appendix.

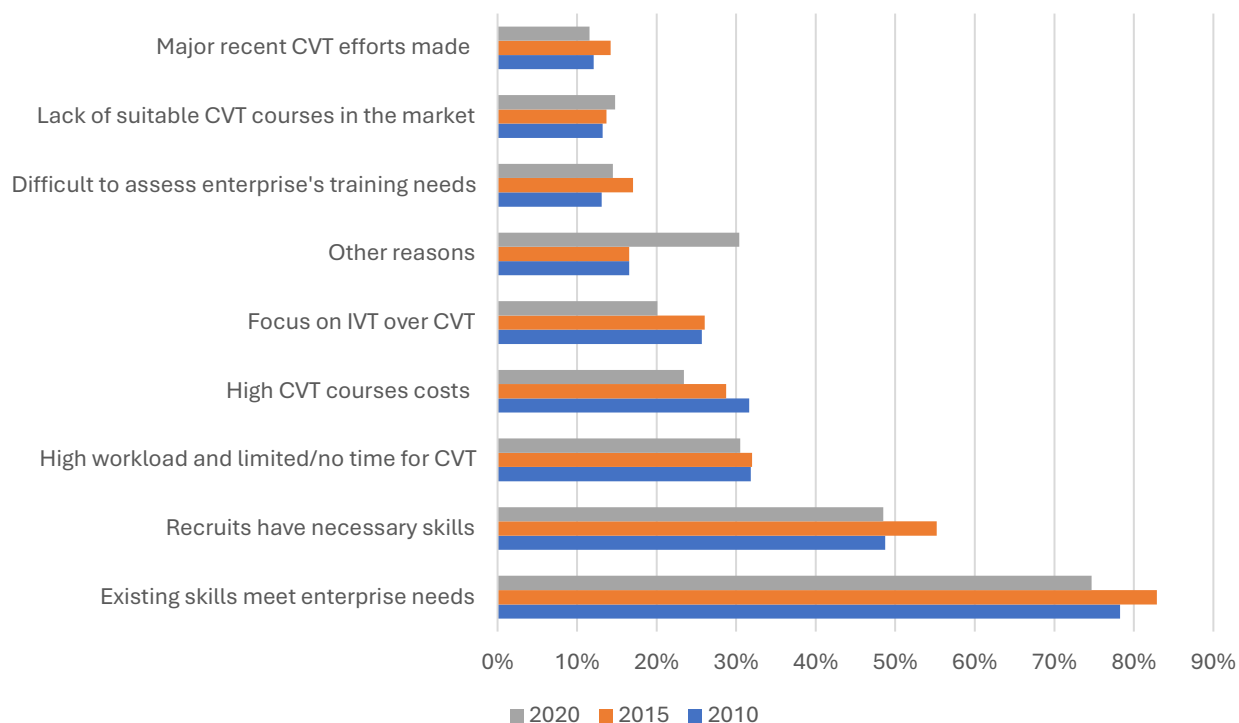


Figure 45. Reasons for the non-provision of CVT activities over time (2010–2020)

2.2.5.2.3 REASONS FOR NON-PROVISION OF TRAINING BY FIRM SIZE AND INDUSTRIES (2010–2020)

Figure 46 and **Figure 47** illustrate trends in the barriers to CVT participation across different firm sizes, industries and waves. Across all categories, the most cited reason for not providing CVT is the belief that existing employee skills meet enterprise needs, with small and medium-sized firms reporting slightly higher rates compared to large firms. Similarly, the notion that new recruits already possess the necessary skills peaked in 2015 before declining in 2020, suggesting firms are increasingly recognizing skill gaps among newly hired employees.

Time constraints and high workload remain a consistent barrier across all years, with slight variations among different firm sizes and industries. Financial barriers, such as high CVT course costs, have steadily decreased, particularly in larger firms and knowledge-intensive sectors, suggesting improved accessibility to training or shifting investment priorities.

Notably, the "other reasons" category saw a sharp increase in 2020, especially among large firms, possibly reflecting new challenges such as digitalization, remote work adjustments, or economic uncertainties. The focus on Initial Vocational Training (IVT) over CVT has remained stable, indicating that many firms prioritize early workforce development rather than ongoing skill enhancement.



Figure 46. Size class disparities in reasons for non-provision of CVT activities among enterprises that did not provide CVT training (2010-2020)



Figure 47. Economic activity disparities in reasons for non-provision of CVT activities among enterprises that did not provide CVT training (2010-2020)

Across industries, sectors such as information and communication; financial and insurance activities tend to report lower concerns about CVT costs and training availability. In contrast, construction and wholesale/retail industries exhibit higher barriers, particularly regarding time constraints and difficulty assessing training needs. These findings suggest that while financial barriers are becoming less significant, the perception of training necessity and accessibility remains a key challenge, particularly for smaller enterprises and certain traditional industries. The appendix ([Table 43](#) and [Table 44](#)) contain the calculated figures.

2.3 Discussion

The analysis, based on the Adult Education Survey (AES) and the Continuing Vocational Training Survey (CVTS), provides key insights into participation rates and barriers in education and training. The results show that participation in formal, non-formal, and informal training has increased over time, with informal learning exhibiting the highest engagement levels. However, disparities persist across demographic and socio-economic groups. Women participate in education and training at slightly higher rates than men, but they face greater barriers related to family responsibilities. Younger individuals are significantly more likely to engage in training than seniors, although senior participation has been increasing. Income also plays a decisive role, with higher-income individuals more engaged in training, while lower-income groups show growing willingness but remain constrained by financial barriers.

A major finding is that the willingness to participate is strongly associated with past experience in training. Individuals who have previously engaged in education and training are more likely to pursue further learning opportunities, indicating the importance of sustained engagement. Additionally, the analysis highlights the role of guidance and access to information in influencing participation. Those who have received career or training guidance, or actively sought information on their own, are significantly more likely to engage in training. However, a substantial portion of respondents, particularly older individuals and those in lower-income brackets—report that they do not feel the need for further education or training, suggesting that awareness and perceived relevance are key obstacles.

The findings also show structural and financial barriers that hinder participation. The most frequently cited barriers include schedule conflicts, financial constraints, and family responsibilities, with notable differences across demographic groups. Over time, schedule-related barriers have increased, particularly among employed individuals. Financial concerns remain a major issue for lower-income groups, while lack of employer or institutional support is another significant challenge.

The CVTS analysis complements these findings by highlighting key trends in enterprise-provided training. Participation in continuing vocational training (CVT) activities has grown over time, but disparities exist across firm sizes and industries. Large companies are significantly more likely to offer formal and structured training, while smaller enterprises rely more on informal learning opportunities or do not provide training at all. Sectoral differences also play a role, with high-skill industries investing more in training than low-skill sectors. The CVTS data further reveals that the

most common barriers to training provision include high costs, lack of demand from employees, and limited organizational resources.

The insights from both AES and CVTS suggest that increasing awareness about training opportunities and providing personalized guidance could help address participation gaps. The analysis indicates that personalized skills assessments and tailored training recommendations could be effective in helping individuals and firms better understand their training needs. The next section provides a framework for a nudge-based intervention based on these results. By addressing these challenges, policymakers and training providers can design more effective interventions to support workforce development and lifelong learning across diverse groups.

3. EXPERIMENTAL DESIGN

3.1 THE CONCEPT OF NUDGES

This section aims to design a mechanism for encouraging unemployed individuals to enroll in vocational education and training (VET) programs by providing nudges related to personalized and transparent skill-based insights and highlighting the benefits of upskilling. "Nudges" (Thaler & Sunstein, 2008) - representing subtle and low-cost adjustments in the choice framework that do not limit the overall options available - have demonstrated effectiveness as budget-friendly policy interventions across diverse contexts, addressing various behavioural barriers in decision-making. For example, different types of nudges have been used to encourage pro-environmental behaviour by reducing energy consumption and waste (Allcott, 2011a; Ayres, 2013; Ito et al., 2018; List et al., 2024). Other settings that nudge had a considerable impact are charity giving (List et al., 2021), tax compliance (Antinyan & Asatryan, 2024), health and nutrition (Kroese et al., 2016, 2016), and retirement savings (Jachimowicz et al., 2019).

3.1.1 NUDGES FOR EDUCATION AND TRAINING

In the context of unemployed individuals, nudges can help overcome information overload, procrastination, and the perceived irrelevance of training programs. As shown in section two, a major barrier to training participation is low perceived benefits and lack of self-efficacy, as captured in the AES survey by the many participants who felt no need for education and training. Behavioural nudges—such as personalised feedback, social proof, commitment devices, and simplification—can effectively encourage engagement. Experimental studies show that behavioural nudges to the unemployed addressing the lack of self-skill awareness and awareness of training and psychological frictions related to training programs increased participation rates (Barr & Turner, 2018; Lehner, L., & Schwarz, A., 2024). To this end, Manoli and Patel (2019), show that job search assistance through personalized counselling and skill assessment appears to have also strong and positive effects on employment. Furthermore, they show that for training programs to be successful, they must be demand-driven and targeted at jobseekers who are most likely to benefit. Additionally, pairing training with mentorship, job placement services, and financial incentives may improve outcomes. Similarly, Bobonis et al. (2014) show that job training must be coupled with personalized assistance, such as targeted job and training search assistance).

Abel et al. (2019), find that behavioural tools, particularly structured planning prompts, can significantly enhance training participation and job search efforts. While reminders and peer accountability do not seem to add much, self-commitment through detailed planning helps individuals bridge the gap between intention and action. Alfonsi et al., (2023) find that many students held overly optimistic beliefs about starting wages and job availability, leading them to reject jobs

and delay training. However, mentorship and personalized recommendations reduced these unrealistic expectations, leading to lower reservation wages and fewer rejected job offers, ensuring students better used their vocational training.

3.2 PROPOSED NUDGE-BASED EXPERIMENT

In this section, we propose a design for a nudge-based experiment that will aim to alleviate various behavioural biases found in the literature that hinder training enrolment. For example, based on the results of Kahneman and Tversky (2016) showing that people are more motivated to avoid losses than to gain equivalent rewards, a nudge about framing training programs as an opportunity to "avoid missing out on in-demand skills" can be more effective than presenting them as an optional benefit.

Hypotheses:

- Providing tailored skill-based information and linking it to relevant training opportunities will increase participation in training programs.
- Identifying individual skills, reflecting by beneficiaries and counselling staff, and connecting these skills to occupational profiles and relevant region-specific training opportunities, are essential for increasing participation in training programs.
- Social norms (e.g., showing how many people in similar situations have benefited from training) or other nudges will reduce inertia and increase sign-ups.
- Checklist framing builds psychological momentum by showing the completion of many small actions (Amir & Ariely, 2008).

Experiment design of a Randomized Control Trial (RCT)

❖ Treatment group:

Receives a personalized skill report /visualization through Skill Lab's AI tool along with the supervision and guidance of the counsellor. This is to assure the optimal use of SkillLab's tool, especially for beneficiaries who require more support due to language barriers, low digital literacy or other barriers. The information received by the participant will include:

- highlights of their current skills.
- a simple and engaging visualization of their skills gap (similar to probability of ideal matching to skills set that are or will be shortly in high demand) relative to skills demanded in available jobs.

or instead, if current labour market data is unavailable,

- data utilization on growing industries and the skills they demand. Then, provide a simple and engaging visualization of their skills gap relative to digital, green, or other skills in high demand.
-

Next, the treatment group receives

- a list of recommended training programs to bridge the gap.
- an additional social norms-type nudge (e.g., "70% of people with similar backgrounds improved their job prospects after training").

or instead, we may use in addition to the recommended training programs a “Checklist framing” nudge:

- Checklist framing” nudge
 - “Step 1: Identify your skills”
 - “Step 2: See your career opportunities”
 - “Step 3: Enroll in training and secure your future!”

or instead, we may use in addition to the recommended training programs a “cost of inaction” nudge:

- Cost of inaction” nudge
 - "Without digital skills, you might miss out on 60% of job opportunities in the next 5 years."
 - "Many companies are moving towards green energy. Without training, your current skills may become outdated."

❖ **Control group**

- Receives the same service that was already in place at the employment counselling service about available training programs. For reasons of ethical considerations the control group will receive personalized insights through SkillLab’s app at a later stage.
- a list of recommended training programs that can bridge the gap.
- an additional social norms-type nudge (e.g., "70% of people with similar backgrounds improved their job prospects after training").

or instead, we may use in addition to the recommended training programs a “Checklist framing” nudge:

- Checklist framing” nudge
 - “Step 1: Identify your skills”
 - “Step 2: See your career opportunities”
 - “Step 3: Enroll in training and secure your future!”

or instead, we may use in addition to the recommended training programs, a “cost of inaction” nudge:

- Cost of inaction” nudge
-

"Without digital skills, you might miss out on 60% of job opportunities in the next 5 years."

"Many companies are moving towards green energy. Without training, your current skills may become outdated."

Measurement and evaluation

Key Metrics:

- Enrolment Rate in Training Programs (Primary Outcome)
- Completion Rate of Training Programs
- Perceived Relevance of Training (Survey)
- Job Placement Rate Post-Training (Follow-up Survey)

Data collection methods:

- Pre- and Post-Surveys: Measure changes in attitudes toward training, perceived skill gaps, and motivation.
- Administrative Data: Track actual training enrolment and completion.
- Follow-up Interviews: Gather qualitative insights into motivation and perceived barriers.

Expected impact

- Higher enrolment rates in training programs due to increased motivation and more precise skill-relevance mapping (directly measurable).
- Reduction in skill mismatches, improving labour market mobility (not directly measurable).
- Improved policy recommendations based on the experimental findings.

3.3 IMPLEMENTATION PLAN

For the experiment, SkillLab will implement a skills-profiling tool in collaboration with local education providers and employment/career counselling services. The tool will allow for the creation of granular skills profiles of job and education seekers and recommended matches to education offers based on these profiles. The implementation will take place in four regions across Europe: Borås in Sweden, Baden-Wuerttemberg in Germany, Catalonia in Spain, and Tuscany in Italy. Through the network of EARLALL, regional representatives from ministries, education provider associations, and municipalities have been activated in each region. The implementation of the tool and experiment will follow these steps:

1. Context mapping and identification of relevant sectors

Together with the regional contacts, each local context is analysed regarding its available labour market information and educational ecosystem. Relevant and in-demand economic sectors, occupations, and skills are identified. This allows for the identification of relevant education providers and courses. Public support options for job- and education seekers are also identified regarding education and career pathways.

2. Alignment with employment and career guidance services

Current employment and career guidance service provision is analysed to understand typical support options for accessing career and education pathways for jobseekers. With the selected service providers, the optimal implementation point of the experiment in their service delivery will be identified (e.g. skills profiling as a next step after the initial intake interview).

Special attention will be paid to data privacy and security measures in accordance with GDPR and local requirements, including alignment with each implementation organisation's relevant departments. As part of the experiment, each implementation organisation will sign a Data Processing Agreement.

The participating career counsellors will receive an onboarding and training session on how to use the SkillLab tool in the experiment effectively. This training will be provided as an online webinar to all counsellors or selected counsellors (depending on language barriers) as a Training of Trainers format.

3. Selection of regional VET providers based on local context

For each local context, relevant regional education and specifically VET providers will be identified based on the local context analysis and selected in-demand sectors, occupations, and skills. Selected course information will be provided and adapted to the SkillLab tool in order to connect users to education opportunities based on their individual skills profiles.

For the adaptation of the course information, participating education providers will receive templates for the required course information as well as guidance for any needed quality assurance to assure that learning outcomes align with associated skills and careers.

4. Adjustment of tool for each context

Based on points 1, 2 and 3, each region will receive an adjusted version of the tool, tailored to their economic and educational context, as well as the needs of the specific participant group. These adjustments include:

- Localisation
 - National language availability for all regions
 - Adjustment of careers and occupations to reflect regional relevant and in-demand options
 - Adjustments to the taxonomy, especially regarding occupation names, labels, and descriptions
 - Adaptation of course information to recommend education matches to participants, including quality assurance of skills tagged to courses
- White labeling
 - Visual and design adjustments to fit the needs of the implementing organisations and their communication styles

5. Active experiment phase and follow-up

The experiment will be conducted over a period of 6 months, during which participants will receive education offers based on their individual skills profiles. After the conclusion of this counselling period, a follow-up with career counselling services and education providers will be conducted to evaluate the impact of the intervention.

Approximate timeline of implementation

Activity	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26
Activating regions	■	■													
Context mapping	■	■	■	■	■										
Identifying relevant sectors + occupations		■	■	■	■										
Alignment career counselling services				■	■	■	■								
Selection of education providers				■	■	■	■								
Adaptation of course information					■	■	■								
Tool localisation					■	■	■	■							
Training for counsellors								■	■	■					
Active experiment phase										■	■	■	■	■	■

4. PARTICIPANT ORGANIZATIONS

This section presents four study cases from EARLALL member regions, selected to highlight the diversity of vocational education and training (VET) approaches and lifelong learning initiatives across different European contexts. The regions of Tuscany, Catalonia, Borås, and Baden-Württemberg represent a broad spectrum of education and employment policies, training structures, and socio-economic environments. Each case demonstrates a unique strategy for enhancing workforce skills, fostering social inclusion, and aligning education with regional labour market needs.

By analyzing these study cases, we gain insights into how regional collaboration, industry partnerships, and flexible learning pathways contribute to effective lifelong learning ecosystems. These cases reflect a commitment to innovation, adaptability, and inclusion, ensuring that vocational training remains responsive to local and global challenges.

4.1 TUSCANY REGION: OVERVIEW

Tuscany Region is a Public Regional Authority with legislative, administrative, and financial autonomy. It plays a crucial role in shaping policies at the regional level across multiple domains, including:

- Education and Vocational Training
- Employment and Economic Development
- Social Issues and Healthcare
- Agriculture and Environmental Sustainability

As a regulatory body for Vocational Education and Training (VET), Tuscany Region manages the Public Employment Services System (PES) within its jurisdiction, providing career and vocational guidance for various social groups, including people with disabilities, unemployed individuals, women, minority ethnic communities, ex-prisoners, and youth at risk of school dropout.

Additionally, the region holds a significant role in the accreditation, certification, and recognition of skills and competencies within formal, non-formal, and informal training systems. This aligns with both the Regional Qualification Framework (RQF) and the National Qualification Framework (NQF).

Tuscany Region also functions as a Managing Authority for structural funds such as the European Social Fund (ESF) and the European Regional Development Fund (ERDF). These funds are instrumental in driving socio-economic policies and initiatives, including infrastructure modernization, business support, youth employment programs, environmental protection, and climate change mitigation measures.

4.1.1 ASSOCIATED TRAINING PROVIDERS AND EDUCATIONAL INSTITUTIONS

Tuscany Region collaborates with multiple training institutions to deliver industry-relevant programs that align with regional economic needs. These institutions, primarily ITS Academies (Istituti Tecnologici Superiori), offer higher technical education aimed at fostering innovation, competitiveness, and employability. Below are key institutions associated with the Tuscany Region:

4.1.1.1 ITS PRODIGI FOUNDATION – DIGITAL PROFESSION

- **Website:** [ITS PRODIGI](#)
- **Focus Area:** Information, Communication, and Data Technologies
- **Program Highlights:** IT and digital training to equip professionals with business innovation skills.
- **Delivery Mode:** In-person, online (asynchronous learning via TRIO Regional Platform), and apprenticeship-based training.

4.1.1.2 ITS SATI ACADEMY FOUNDATION

- **Website:** [ITS SATI](#)
- **Focus Area:** Business Administration, Financial Management, HR Development
- **Program Highlights:** Prepares professionals for complex business environments using experiential learning approaches.
- **Delivery Mode:** In-person and hybrid formats.

4.1.1.3 ITS ATE FOUNDATION – ACADEMY OF BUILDING TECHNOLOGY

- **Website:** [ITS ATE](#)
- **Focus Area:** Construction and Building Technologies
- **Program Highlights:** Digitalization and sustainability-driven courses catering to the building sector.

4.1.1.4 ITS E.A.T. FOUNDATION – TUSCAN AGRI-FOOD EXCELLENCE

- **Website:** [ITS E.A.T.](#)
- **Focus Area:** Agri-food Systems
- **Program Highlights:** Training professionals for the preservation and enhancement of Tuscan agri-food heritage.

4.1.1.5 ITS VITA FOUNDATION – NEW LIFE TECHNOLOGIES

- **Website:** [ITS VITA](#)
- **Focus Area:** Chemistry and Life Sciences
- **Program Highlights:** Developing skilled technicians for the chemical-pharmaceutical industry.

4.1.1.6 ITS ISYL – ITALIAN SUPER YACHT LIFE

- **Website:** [ITS ISYL](#)
- **Focus Area:** Sustainable Mobility and Logistics
- **Program Highlights:** Training for the nautical transport and logistics supply chain, covering production, maintenance, and mobility.

4.1.1.7 ITS TAB FOUNDATION – TOURISM, ART, AND CULTURAL HERITAGE

- **Website:** [ITS TAB](#)
- **Focus Area:** Tourism, Arts, and Cultural Heritage Management
- **Program Highlights:** Training for careers in tourism and cultural heritage conservation.

4.1.1.8 ITS PRIME FOUNDATION – INDUSTRIAL MAINTENANCE

- **Website:** [ITS PRIME](#)
- **Focus Area:** Mechatronics and Industrial Maintenance
- **Program Highlights:** Post-diploma technical training for mechanical and mechatronic fields.

4.1.1.9 ITS M.I.T.A. FOUNDATION – MADE IN ITALY TUSCANY ACADEMY

- **Website:** [ITS M.I.T.A.](#)
- **Focus Area:** Fashion Industry
- **Program Highlights:** High-level training for careers in fashion, working closely with prestigious brands.

4.1.1.10 ITS ENERGY AND ENVIRONMENT FOUNDATION

- **Website:** [ITS Energy and Environment](#)
- **Focus Area:** Renewable Energy and Sustainability
- **Program Highlights:** Courses on optimizing energy consumption and developing sustainable energy sources.

4.1.2 IMPACT AND RELEVANCE OF PARTICIPATING ORGANIZATIONS

The institutions associated with Tuscany Region contribute significantly to workforce development by addressing regional skills gaps and enhancing employability. Key characteristics of their programs include:

- **Industry Alignment:** Programs designed in collaboration with businesses to meet labour market demands.
 - **Internship Integration:** A minimum of 35% of curricula consist of mandatory internships.
-

- **Flexibility:** Programs are adaptable to technological advancements, digitalization, and green economy needs.
- **International Recognition:** Certification aligned with the European Qualifications Framework (EQF), including the EUROPASS Diploma Supplement.

4.1.3 SUMMARY OF TRAINING PROGRAMS AND INDUSTRIES COVERED

- **Number of Training Programs:** 52
- **Key Target Sectors:**
 - Energy
 - Fashion and Design
 - Mechatronics and Engineering
 - Tourism and Cultural Heritage
 - Sustainable Mobility and Logistics
 - Chemistry and Life Sciences
 - Agri-food and Sustainable Agriculture
 - Construction and Infrastructure
 - Business and Financial Services
 - Information and Communication Technologies

4.2 CATALONIA REGION: OVERVIEW

The Public Employment Service of Catalonia (SOC) is an autonomous public and administrative body attached to the Department of Employment, Social Affairs, and Families of the Generalitat de Catalunya. It is responsible for employment-related policies and initiatives across the region.

Its key areas of activity include:

- Professional guidance
- Job intermediation
- Professional training for employment
- Promotion of employment
- Assistance to companies
- Job mobility
- Entrepreneurship and self-employment
- Local economic development

The SOC operates a network of eight innovation and vocational training centers, known as "Centres d'innovació i formació ocupacional (CIFO)."

4.2.1 GENERAL INFORMATION ABOUT CATALONIA

Catalonia is an autonomous community in Spain, located in the northeast of the Iberian Peninsula, south of the Pyrenees. It is divided into four provinces and 43 comarques. The capital, Barcelona, is the second-most populous city in Spain and one of the largest urban areas in the European Union.

As of 2024, Catalonia had a population of 8,067,454, with 1,194,947 residents lacking Spanish citizenship (approximately 16% of the population). The Urban Region of Barcelona includes over five million people and is a major economic and cultural hub.

Catalonia has a distinct language (Catalan), culture, and history, reinforcing its regional identity. Industry, tourism, and commerce drive its economy, making it a critical economic player within Spain and the broader European market.

4.2.2 ASSOCIATED TRAINING PROVIDERS AND EDUCATIONAL INSTITUTIONS

The Public Employment Service of Catalonia (SOC) collaborates with various training institutions to provide industry-relevant education and vocational programs. These institutions focus on equipping individuals with the necessary skills for employment in key economic sectors.

4.2.2.1 CIFO L'HOSPITALET DE LLOBREGAT

- **Type of Training:** Professional Certificates, Vocational Education and Training (VET)
- **Mode of Delivery:** In-person

4.2.2.2 CIFO SANT FELIU DE LLOBREGAT

- **Type of Training:** Professional Certificates, Vocational Education and Training (VET)
- **Mode of Delivery:** In-person

4.2.2.3 CIFO BARCELONA 'LA VIOLETA'

- **Type of Training:** Professional Certificates, Vocational Education and Training (VET)
- **Mode of Delivery:** In-person

4.2.2.4 CIFO SALT

- **Type of Training:** Professional Certificates, Vocational Education and Training (VET)
- **Mode of Delivery:** In-person

4.2.2.5 CIFO SABADELL

- **Type of Training:** Professional Certificates, Vocational Education and Training (VET)
 - **Mode of Delivery:** In-person
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4.2.2.6 CIFO SANTA COLOMA

- **Type of Training:** Professional Certificates, Vocational Education and Training (VET)
- **Mode of Delivery:** In-person

4.2.2.7 CIFO TARRAGONA

- **Type of Training:** Professional Certificates, Vocational Education and Training (VET)
- **Mode of Delivery:** In-person

4.2.2.8 CIFO LLEIDA

- **Type of Training:** Professional Certificates, Vocational Education and Training (VET)
- **Mode of Delivery:** In-person

4.2.2.9 CENTRO DE FORMACIÓN PROFESIONAL DE AUTOMOCIÓN (CFPA)

- **Type of Training:** Industry-specific Certifications, Professional Certificates, Vocational Education and Training (VET)
- **Mode of Delivery:** In-person

4.2.3 IMPACT AND RELEVANCE OF PARTICIPATING ORGANIZATIONS

The training providers in Catalonia contribute significantly to workforce development by addressing regional skills gaps and improving employability. Key characteristics of their programs include:

- **Industry Alignment:** Training programs designed in collaboration with businesses to ensure relevance to labour market needs.
- **Specialized Training Centers:** A strong network of CIFO centers dedicated to vocational and technical education.
- **Employment-Focused Approach:** Training programs emphasize employability, offering certifications recognized within national and European frameworks.
- **Strategic Economic Sectors:** Programs target key industries critical to the region’s economy.

4.2.4 SUMMARY OF TRAINING PROGRAMS AND INDUSTRIES COVERED

- **Number of Training Programs (2025):** 351
 - **Key Target Sectors:**
 - Graphic Arts
 - Image and Sound
 - Mechanical Manufacturing
-

- Automotive
- Electricity, Electronics, and Industry 4.0
- Information Technology and Communications
- Food Industries
- Chemistry
- Installation and Maintenance of Logistics
- Agriculture
- Safety and Environment
- Energy and Water
- Eco-efficient Rehabilitation

4.3 BORÅS STAD: OVERVIEW

Borås Stad – Arbetslivsförvaltningen (Working Life Department) is a municipal department with approximately 250 staff members and over 15 years of experience supporting economically vulnerable citizens and individuals distant from the labour market. The department is crucial in managing economic assistance, assessing individual needs, and implementing capacity-building measures to facilitate labour market entry.

Key areas of activity include:

- Job-focused placements
- Health and lifestyle programs
- Study motivation initiatives
- Social empowerment activities

Additionally, the department fosters lifelong learning by offering low-skilled job training, personal development programs, and vocational education. It collaborates closely with other public agencies, including the Adult Education Department and the Swedish Public Employment Service, as well as civil society organizations to ensure social inclusion and improved quality of life.

4.3.1 GENERAL INFORMATION ABOUT BORÅS

Borås is a Swedish city with a population of approximately 115,000 (as of 2024), located in Västra Götaland, about an hour east of Gothenburg. Established over 400 years ago, Borås historically thrived as a textile production hub and remains a centre for textile design, innovation, and sustainable manufacturing.

In addition to textiles, Borås has strong industries in logistics, technology, retail, and creative enterprises, positioning it as a strategic economic location with an evolving industrial landscape.

4.3.2 ASSOCIATED TRAINING PROVIDERS AND EDUCATIONAL INSTITUTIONS

The Working Life Department collaborates with various training providers to offer vocational education and employment-focused programs. These institutions provide sector-specific skills, enabling individuals to integrate into key regional industries.

4.3.2.1 JOBB BORÅS

- **Website:** [Jobb Borås](#)
- **Type of Training:** Basic skills training, work placements
- **Program Highlights:** Job-focused placement, health and lifestyle programs, study motivation, and social empowerment.
- **Mode of Delivery:** In-person

4.3.2.2 VUXENUTBILDNINGEN (ADULT EDUCATION)

- **Website:** [Vuxenutbildningen](#)
- **Type of Training:** Swedish as a second language, adapted adult education, vocational education and training (VET), secondary education for adults
- **Mode of Delivery:** In-person, hybrid, online

4.3.2.3 SUBCONTRACTED TRAINING PROVIDERS

Several institutions operate under the Adult Education Department, delivering specialized vocational training:

- **Arena Utbildning**
- **Astar**
- **Kunskapscompaniet**
- **Movant**
- **Naturbruk Västra Götalandsregionen**
- **Veldi Kompetens**

4.3.3 IMPACT AND RELEVANCE OF PARTICIPATING ORGANIZATIONS

The training providers in Borås play a key role in enhancing workforce competencies, fostering employment opportunities, and addressing local economic needs. Their programs focus on:

- **Industry Alignment:** Training aligned with labour market requirements.
-

- **Flexible Learning Paths:** Various delivery methods, including in-person, hybrid, and online formats.
- **Targeted Skills Development:** Specialization in both general and industry-specific competencies.

4.3.4 SUMMARY OF TRAINING PROGRAMS AND INDUSTRIES COVERED

- **Number of Training Programs:**
 - 9 Higher Vocational Education and Training (HVET) programs
 - Several additional programs through the regional education network
- **Key Target Sectors:**
 - Healthcare
 - Transport
 - Information Technology (IT)
 - Construction
 - Pedagogical Support

4.4 BADEN WÜRTTEMBERG REGION: OVERVIEW

The **Volkshochschulverband Baden-Württemberg e.V. (vhs BW)** is the regional association of **Volkshochschulen (adult education centers)** in the German federal state of **Baden-Württemberg (BW)**. Headquartered in Leinfelden-Echterdingen near Stuttgart, vhs BW represents **165 regional Volkshochschulen with 700 local sub-offices**, making it the largest non-profit provider of further education in Germany.

With over **2 million participants annually**, vhs BW offers diverse education programs, including vocational training, language courses, and intercultural training. The organization is pivotal in promoting lifelong learning, social inclusion, and employment-oriented education. It collaborates with **public employment services, chambers of commerce, universities, and businesses** to provide tailored education and career guidance.

Coordination of the “Landesnetzwerk Weiterbildungsberatung Baden-Württemberg”

Since 2015, the Volkshochschulverband Baden-Württemberg has been coordinating the “Landesnetzwerk Weiterbildungsberatung Baden-Württemberg” (State Network for Continuing

Education Counseling). (<http://www.lnwbb.de/>) Moreover, its coordination office, financed by the Baden-Württemberg Ministry of Education and Cultural Affairs. The vhs BW operates the coordination office of the LN WBB. The “Landesnetzwerk Weiterbildungsberatung” is the nationwide guidance system for continuing education in Baden-Württemberg. The advisory network integrates all relevant organizations from the education sector and the world of work that offer counseling services in BW. The members of the state network include:

- adult education providers and Volkshochschulen
- chambers of industry and commerce and crafts
- employers’ organisations
- welfare institutions
- church based institutions
- universities and academies
- public employment services (Arbeitsagenturen and Jobcenter) as associated members
- and many others

Currently, the guidance network has more than 200 members based all over the region of Baden-Württemberg. They offer educational guidance services for general, vocational and academic continuing education in adult education in the framework of typical service levels and quality standards. vhs BW together with the coordination office of the LN WBB is responsible for administrative, strategic and financial issues of the network, for the quality management, for the training of guidance counsellors and other staff of guidance offices, for the IT infrastructure, marketing and the innovation of services.

4.4.1 GENERAL INFORMATION ABOUT BADEN-WÜRTTEMBERG

Baden-Württemberg, located in **southwest Germany**, is one of the country’s most **economically dynamic and innovative regions**. It is home to approximately **11 million people** and features major cities such as **Stuttgart, Mannheim, and Karlsruhe**. The region is known for its strong industrial base, particularly in **automotive manufacturing, engineering, information technology, and renewable energy**.

Often referred to as the **"Silicon Valley of Germany,"** Baden-Württemberg hosts major global companies such as **Daimler, Porsche, and Bosch**, fostering cutting-edge research and development. The region also has a well-developed ecosystem of **small and medium-sized enterprises (Mittelstand)** that contribute significantly to economic growth.

Additionally, Baden-Württemberg boasts a **highly developed education sector**, with a **network of universities, research institutions, and vocational training centers** that strengthen the workforce and drive innovation.

4.4.2 ASSOCIATED TRAINING PROVIDERS AND EDUCATIONAL INSTITUTIONS

The **vhs BW network** collaborates with various education providers, industry bodies, and research institutions to deliver high-quality training programs. These institutions cater to diverse learning needs, from vocational education to lifelong learning and scientific further training.

4.4.2.1 CHAMBER OF INDUSTRY AND COMMERCE KARLSRUHE

- **Website:** [IHK Karlsruhe](#)
- **Type of Training:** Dual VET training, vocational and further education in industry and commerce
- **Mode of Delivery:** In-person, online, hybrid

4.4.2.2 REGIONALBÜRO FÜR BERUFLICHE FORTBILDUNG RAVENSBURG

- **Website:** [Regionalbüro Ravensburg](#)
- **Type of Training:** Vocational further education across multiple industries
- **Mode of Delivery:** In-person, hybrid

4.4.2.3 VOLKSHOCHSCHULE REUTLINGEN

- **Website:** [VHS Reutlingen](#)
- **Type of Training:** General adult education, IT training, business administration, soft skills
- **Mode of Delivery:** In-person, hybrid

4.4.2.4 VOLKSHOCHSCHULE UNTERES REMSTAL

- **Website:** [VHS Unteres Remstal](#)
- **Type of Training:** General adult education, IT training, business administration, soft skills
- **Mode of Delivery:** In-person, hybrid

4.4.2.5 VOLKSHOCHSCHULVERBAND BADEN-WÜRTTEMBERG E.V.

- **Website:** [vhs BW](#)
 - **Type of Training:** Business administration courses, Xpert Business training
 - **Mode of Delivery:** In-person, online, hybrid
-

4.4.2.6 AKADEMIE FÜR WISSENSCHAFTLICHE WEITERBILDUNG DER PÄDAGOGISCHEN HOCHSCHULE WEINGARTEN

- **Website:** [AWW Weingarten](#)
- **Type of Training:** Scientific further education (academic and non-academic) in education, pedagogy, and psychology
- **Mode of Delivery:** In-person, hybrid, online

4.4.3 IMPACT AND RELEVANCE OF PARTICIPATING ORGANIZATIONS

The **training providers in Baden-Württemberg** play a crucial role in workforce development and social inclusion. Their programs are designed to:

- **Support lifelong learning** and career transitions through high-quality education.
- **Provide vocational training** aligned with labour market demands.
- **Foster industry collaboration** to ensure curriculum relevance.
- **Enhance digital and sustainability skills** to prepare for emerging economic challenges.

4.4.4 SUMMARY OF TRAINING PROGRAMS AND INDUSTRIES COVERED

- **Number of Training Programs:** Several hundred across general adult education, vocational further training, and scientific further training.
- **Key Target Sectors:**
 - **Vocational Further Training:** Trade, retail, mechatronics, sustainable mobility, logistics, hospitality, tourism, agri-food, business services, ICT.
 - **General Adult Education (vhs):** Basic skills, language training, IT, business administration, soft skills, democracy training, health, culture, and sports.
 - **Scientific Further Training:** Education, pedagogy, and psychology.

5. CONCLUDING REMARKS

The findings and proposals outlined in this deliverable D2.3 underscore the importance of increasing participation in education and training programs to address skills shortages and mismatches across Europe. Through a rigorous analysis of participation trends, barriers, and determinants, we have identified key challenges that hinder engagement in lifelong learning. Socioeconomic disparities, demographic factors, and structural obstacles remain significant barriers, requiring targeted interventions to enhance accessibility and effectiveness. The insights drawn from the Adult Education Survey (AES) and the Continuing Vocational Training Survey (CVTS) reveal a critical need for tailored approaches that account for individual and institutional constraints.

One of the most significant takeaways is the role of behavioural nudges in encouraging participation. The experimental design proposed within this deliverable seeks to test the effectiveness of these interventions, offering personalized skill-based insights and highlighting the benefits of upskilling. By leveraging behavioural economics principles, such as social proof, commitment framing, and simplified decision-making, we anticipate positive outcomes in training participation rates. This approach aligns with previous research that demonstrates the potential of behavioural nudges in reducing psychological barriers and promoting proactive engagement in education and training.

Moreover, this deliverable emphasizes the necessity of multi-stakeholder collaboration. Regional training providers, employment services, and policymakers must work in tandem to implement and scale these interventions effectively. The involvement of stakeholders from Tuscany, Catalonia, Borås Stad, and Baden-Württemberg serves as a model for how localized approaches can be adapted to different regional contexts. The structured implementation plan ensures that best practices and lessons learned can be transferred across different policy environments, enhancing the overall impact of the initiative.

As we move forward, the outcomes of the proposed nudge-based experiments will provide valuable empirical evidence to inform future policies. The success of these interventions will depend on their adaptability, scalability, and responsiveness to evolving labour market demands. The data-driven approach taken in this deliverable highlights the importance of continuous evaluation and refinement to ensure that education and training programs remain relevant and effective.

Ultimately, fostering a culture of lifelong learning requires a concerted effort to remove barriers, enhance motivation, and provide clear pathways to skill development. By addressing the psychological, economic, and structural constraints identified in this study, we can create a more inclusive and dynamic workforce, better equipped to meet the challenges of a rapidly changing labour market. The findings from this research will serve as a foundation for future initiatives aimed at promoting sustainable skill development and workforce resilience across Europe.

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7. APPENDIX

Table 16: Participation rates in education and training types by gender and wave (weighted)

TYPE	MALE				FEMALE			
	2007	2011	2016	2022	2007	2011	2016	2022
Formal	5.7%	8.9%	9.4%	11.6%	6.7%	10.0%	10.4%	13.1%
Non-formal	32.3%	36.0%	40.5%	41.4%	30.9%	35.0%	40.8%	41.9%
Informal	44.8%		60.8%	63.9%	42.1%		60.5%	65.3%

Table 17: Participation rates in education and training types by age (senior vs young) and wave (weighted)

TYPE	SENIOR				YOUNG			
	2007	2011	2016	2022	2007	2011	2016	2022
Formal	2.5%	2.2%	1.8%	1.8%	8.5%	14.3%	15.8%	20.9%
Non-formal	24.8%	28.6%	33.7%	34.0%	35.9%	40.0%	45.7%	48.0%
Informal	38.0%		56.6%	57.9%	46.9%		63.6%	70.0%

Table 18: Participation rates in education and training types by income (T40 vs B60) and wave (weighted)

TYPE	T40			B60		
	2011	2016	2022	2011	2016	2022
Formal	8.7%	8.7%	10.3%	9.2%	10.1%	13.4%
Non-formal	48.6%	51.7%	50.7%	30.5%	33.6%	35.4%
Informal		66.4%	70.8%		58.6%	61.2%

Table 19: Participation rates in education and training types by employment status and wave (weighted)

TYPE	YEAR	EMPLOYED	UNEMPLOYED	OUTSIDE LABOUR FORCE
Formal	2007	6.2%	6.2%	6.3%
	2011	6.8%	7.8%	16.7%
	2016	6.1%	7.7%	20.4%
	2022	7.2%	8.9%	24.7%
Non-formal	2007	39.2%	19.8%	12.5%
	2011	45.0%	22.2%	17.2%
	2016	50.6%	24.1%	21.5%
	2022	51.7%	25.7%	23.8%
Informal	2007	48.1%	39.0%	30.9%
	2016	62.4%	60.1%	56.4%
	2022	67.1%	61.2%	59.9%

Table 20: Willingness to participate in education and training by wave (total sample) (weighted)

WAVE	WILLING			NOT WILLING		
	With prior experience	Without prior experience	Total	With prior experience	Without prior experience	Total
2007	11.3%	13.4%	24.7%	20.6%	51.7%	72.3%
2011	14.2%	11.3%	25.5%	27.4%	45.6%	73.0%
2016	14.7%	11.7%	26.4%	29.3%	43.6%	72.9%
2022	15.8%	10.5%	26.3%	30.2%	42.2%	72.4%

Table 21: Willingness to participate in education and training by gender and wave (weighted)

GENDER	WAVE	WILLING			NOT WILLING		
		With prior experience	Without prior experience	Total	With prior experience	Without prior experience	Total
Male	2007	10.6%	12.9%	23.5%	21.2%	52.2%	73.4%
	2011	13.2%	9.9%	23.2%	29.0%	46.3%	75.2%
	2016	13.5%	10.8%	24.4%	30.1%	44.8%	74.9%
	2022	14.3%	9.9%	24.2%	31.1%	43.4%	74.5%
Female	2007	12.0%	13.9%	25.8%	20.1%	51.2%	71.3%
	2011	15.2%	12.6%	27.9%	25.7%	45.0%	70.8%
	2016	15.9%	12.6%	28.5%	28.4%	42.4%	70.8%
	2022	17.4%	11.2%	28.5%	29.2%	41.0%	70.3%

Table 22: Willingness to participate in education and training by age (senior vs young) and wave (weighted)

AGE	WAVE	WILLING			NOT WILLING		
		With prior experience	Without prior experience	Total	With prior experience	Without prior experience	Total
Senior	2007	7.2%	11.2%	18.5%	16.1%	62.1%	78.2%
	2011	10.0%	9.4%	19.4%	23.2%	56.0%	79.2%
	2016	10.4%	10.1%	20.5%	26.3%	52.5%	78.9%
	2022	11.9%	9.1%	21.0%	27.2%	50.6%	77.8%
Young	2007	13.9%	14.8%	28.7%	23.6%	45.0%	68.6%
	2011	17.2%	12.6%	29.8%	30.2%	38.5%	68.7%
	2016	18.0%	13.0%	31.0%	31.5%	36.8%	68.3%
	2022	19.0%	11.7%	30.7%	32.6%	35.3%	68.0%

Table 23: Willingness to participate in education and training by income (T40 vs B60) and wave (weighted)

INCOME	WAVE	WILLING			NOT WILLING		
		With prior experience	Without prior experience	Total	With prior experience	Without prior experience	Total
T40	2011	18.7%	9.0%	27.6%	37.1%	34.3%	71.4%
	2016	17.9%	9.1%	27.0%	37.1%	35.4%	72.5%
	2022	18.7%	8.2%	26.9%	36.3%	35.8%	72.1%
B60	2011	12.0%	13.3%	25.3%	23.9%	49.4%	73.3%
	2016	12.9%	14.1%	27.0%	23.7%	48.7%	72.3%
	2022	14.0%	12.6%	26.6%	25.2%	46.8%	72.0%

Table 24: Barriers to education and training participation: Willing vs. Unwilling respondents (weighted)

MAIN DIFFICULTY	WILLING	NOT WILLING
Schedule	21.0%	17.6%
Costs	17.2%	7.7%
Family reasons	16.3%	19.2%
Lack of support from employer/public services	8.6%	3.0%
Other personal reasons	7.4%	11.0%
No suitable offer for education/training	6.7%	4.5%
Health or age reasons	4.9%	11.7%
Distance	3.3%	1.4%
Prerequisites	3.2%	3.5%

Table 25: Barriers to education and training participation by wave (weighted)

MAIN DIFFICULTY	2011	2016	2022
Schedule	16.9%	23.9%	21.9%
Costs	18.9%	19.5%	13.6%
Family reasons	16.6%	18.8%	14.0%
Lack of support from employer/public services	10.3%	8.1%	7.5%
Other personal reasons	7.8%	6.2%	8.1%
No suitable offer for education/training	7.0%	6.1%	7.0%
Health or age reasons	3.6%	5.1%	5.9%
Distance	3.8%	3.9%	2.4%
Prerequisites	3.3%	2.3%	3.9%

Table 26: Main difficulties for people willing to participate (more) in education and training by gender and wave (weighted)

MAIN DIFFICULTY	MALE			FEMALE		
	2011	2016	2022	2011	2016	2022
Schedule	21.5%	29.3%	25.8%	13.2%	19.4%	18.6%
Costs	17.4%	17.9%	12.1%	20.1%	20.9%	14.9%
Family reasons	10.4%	11.4%	9.1%	21.6%	25.1%	18.1%
Lack of support from employer/public services	11.5%	9.8%	9.2%	9.4%	6.6%	6.1%
Other personal reasons	8.0%	6.4%	8.1%	7.6%	6.1%	8.1%
No suitable offer for education/training	7.9%	7.3%	7.9%	6.3%	5.2%	6.2%
Health or age reasons	2.8%	4.4%	5.3%	4.2%	5.7%	6.4%
Distance	3.3%	4.2%	2.0%	4.2%	3.6%	2.7%
Prerequisites	3.3%	2.5%	4.2%	3.3%	2.0%	3.7%

Table 27: Main difficulties for people willing to participate (more) in education and training by age (senior vs young) and wave (weighted)

MAIN DIFFICULTY	SENIOR			YOUNG		
	2011	2016	2022	2011	2016	2022
Schedule	16.1%	22.7%	21.5%	17.3%	24.6%	22.1%
Costs	15.7%	15.4%	11.1%	20.4%	21.6%	15.1%
Family reasons	13.0%	15.2%	10.0%	18.2%	20.5%	16.2%
Lack of support from employer/public services	10.5%	9.0%	7.5%	10.3%	7.7%	7.5%
Other personal reasons	8.1%	6.6%	7.7%	7.6%	6.1%	8.3%
No suitable offer for education/training	8.4%	7.1%	8.4%	6.4%	5.7%	6.2%
Health or age reasons	6.8%	10.2%	9.6%	2.2%	2.5%	3.8%
Distance	4.4%	4.7%	2.6%	3.5%	3.4%	2.3%
Prerequisites	2.8%	1.9%	3.3%	3.5%	2.4%	4.3%

Table 28: Main difficulties for people willing to participate (more) in education and training by income (T40 vs B60) and wave (weighted)

MAIN DIFFICULTY	T40			B60		
	2011	2016	2022	2011	2016	2022
Schedule	21.8%	32.5%	27.9%	12.5%	18.1%	17.8%
Costs	13.8%	15.0%	11.5%	21.9%	23.3%	15.6%
Family reasons	16.8%	16.5%	13.5%	15.9%	19.9%	14.4%
Lack of support from employer/public services	11.1%	9.4%	7.4%	10.6%	7.4%	8.0%
Other personal reasons	7.7%	5.9%	8.3%	7.5%	6.5%	8.0%
No suitable offer for education/training	6.9%	6.4%	7.0%	7.0%	5.9%	6.9%
Health or age reasons	2.6%	3.1%	3.7%	4.6%	6.4%	7.8%
Distance	3.9%	3.9%	2.1%	4.1%	4.1%	2.7%
Prerequisites	2.2%	1.7%	2.9%	4.3%	2.7%	4.8%

Table 29: Main difficulties for people not willing to participate in education and training by wave (weighted)

MAIN DIFFICULTY	2016	2022
Family reasons	19.6%	18.8%
Schedule	16.5%	19.0%
Health or age reasons	11.5%	11.9%
Other personal reasons	10.0%	12.2%
Costs	7.5%	8.0%
No suitable offer for education/training	4.5%	4.5%
Prerequisites	2.0%	5.4%
Lack of support from employer/public services	3.1%	2.8%
Distance	1.5%	1.3%

Table 30: Main difficulties for people not willing to participate in education and training by gender and wave (weighted)

MAIN DIFFICULTY	MALE		FEMALE	
	2016	2022	2016	2022
Family reasons	12.5%	13.0%	25.9%	23.7%
Schedule	19.4%	21.6%	13.8%	16.7%
Health or age reasons	11.3%	11.5%	11.7%	12.1%
Other personal reasons	10.6%	12.1%	9.4%	12.3%
Costs	7.1%	7.5%	7.8%	8.3%
No suitable offer for education/training	5.3%	5.3%	3.7%	3.8%
Prerequisites	2.3%	6.1%	1.7%	4.7%
Lack of support from employer/public services	3.9%	3.2%	2.5%	2.5%
Distance	1.5%	1.2%	1.6%	1.3%

Table 31: Main difficulties for people not willing to participate in education and training by age (senior vs young) and wave (weighted)

MAIN DIFFICULTY	SENIOR		YOUNG	
	2016	2022	2016	2022
Family reasons	14.8%	14.8%	23.1%	21.8%
Schedule	14.2%	17.4%	18.1%	20.1%
Health or age reasons	20.7%	20.3%	4.9%	5.4%
Other personal reasons	9.9%	11.5%	10.0%	12.8%
Costs	4.6%	5.8%	9.6%	9.6%
No suitable offer for education/training	4.1%	4.5%	4.8%	4.5%
Prerequisites	2.0%	5.2%	1.9%	5.5%
Lack of support from employer/public	2.5%	2.7%	3.6%	2.9%
Distance	1.7%	1.4%	1.5%	1.2%

Table 32: Main difficulties for people not willing to participate in education and training by income (T40 vs B60) and wave (weighted)

MAIN DIFFICULTY	T40		B60	
	2016	2022	2016	2022
Family reasons	17.3%	17.5%	20.7%	19.9%
Schedule	21.7%	24.6%	13.3%	16.1%
Health or age reasons	7.3%	8.2%	14.7%	14.5%
Other personal reasons	9.7%	13.7%	10.2%	10.4%
Costs	6.0%	6.2%	8.8%	9.9%
No suitable offer for education/training	4.5%	5.5%	4.4%	3.8%
Prerequisites	1.0%	4.3%	2.5%	6.9%
Lack of support from employer/public services	3.8%	2.7%	2.9%	3.0%
Distance	1.5%	1.1%	1.7%	1.5%

Table 33: % Enterprises providing training by type of training, year and size (weighted)

TYPE	YEAR	Small (10-49)	Medium (50-249)	Large (250+)
CVT Courses	2010	51.9%	73.0%	89.2%
	2015	57.8%	76.6%	91.5%
	2020	50.2%	71.8%	88.3%
Other Forms of CVT	2010	49.1%	66.3%	81.1%
	2015	56.4%	74.5%	88.1%
	2020	52.7%	72.6%	87.0%

Table 34: % Enterprises providing training by type of training, year and NACE Rev.2 activity (weighted)

TYPE	YEAR	INDUSTRY	CONSTRUCTION	WHOLESALE & RETAIL TRADE, TRANSPORT, ACCOMMODATION & FOOD SERVICE ACTIVITIES	INFORMATION & COMMUNICATION; FINANCIAL & INSURANCE ACTIVITIES	REAL ESTATE ACTIVITIES; PROFESSIONAL, SCIENTIFIC & TECHNICAL ACTIVITIES; ADMINISTRATIVE & SUPPORT SERVICE ACTIVITIES; ARTS, ENTERTAINMENT & RECREATION; OTHER SERVICE ACTIVITIES
CVT Courses	2010	52.8%	55.5%	52.6%	69.9%	64.0%
	2015	60.0%	62.7%	56.9%	74.7%	68.4%
	2020	58.1%	52.4%	48.2%	70.8%	59.8%
Other Forms of CVT	2010	49.5%	48.1%	49.0%	68.2%	62.2%
	2015	56.7%	53.2%	56.2%	77.7%	70.3%
	2020	58.6%	51.4%	51.3%	76.8%	62.4%

Table 35: % Enterprises providing Internal/External CVT Courses by year and size (weighted)

TYPE	YEAR	Small (10-49)	Medium (50-249)	Large (250+)
Internal	2010	26.2%	48.2%	74.8%
	2015	31.2%	53.5%	80.5%
	2020	30.0%	53.2%	77.2%
External	2010	44.1%	65.8%	82.9%
	2015	50.7%	71.5%	87.3%
	2020	41.5%	64.7%	82.0%

Table 36: % Enterprises providing Internal/External CVT Courses by year and NACE Rev.2 (weighted)

TYPE	YEAR	INDUSTRY	CONSTRUCTION	WHOLESALE & RETAIL TRADE, TRANSPORT, ACCOMMODATION & FOOD SERVICE ACTIVITIES	INFORMATION & COMMUNICATION; FINANCIAL & INSURANCE ACTIVITIES	REAL ESTATE ACTIVITIES; PROFESSIONAL, SCIENTIFIC & TECHNICAL ACTIVITIES; ADMINISTRATIVE & SUPPORT SERVICE ACTIVITIES; ARTS, ENTERTAINMENT & RECREATION; OTHER SERVICE ACTIVITIES
Internal	2010	31.4%	24.2%	27.8%	45.9%	36.7%
	2015	36.3%	30.3%	31.7%	53.4%	42.6%
	2020	38.5%	27.5%	30.7%	52.9%	39.0%
External	2010	44.4%	49.8%	44.3%	61.1%	57.0%
	2015	53.7%	57.7%	49.2%	66.2%	62.4%
	2020	49.7%	46.0%	38.6%	58.1%	53.0%

Table 37: % Enterprises providing other forms of CVT by year and size (weighted)

TYPE	YEAR	Small (10-49)	Medium (50-249)	Large (250+)
Guided-on-the-job training	2010	31.8%	47.2%	64.4%
	2015	40.8%	60.4%	76.3%
	2020	38.6%	58.7%	75.4%
Training at conferences, workshops, trade fairs and lectures	2010	29.9%	48.6%	64.9%
	2015	34.2%	54.5%	74.2%
	2020	24.9%	41.5%	62.5%
Self-directed learning	2010	12.5%	19.3%	34.3%
	2015	18.6%	29.1%	51.8%
	2020	24.4%	43.0%	64.9%
Job rotation, exchanges or secondments	2010	8.4%	14.5%	28.6%
	2015	10.0%	20.1%	36.2%
	2020	10.5%	18.1%	33.3%
Learning/quality circles	2010	7.8%	13.6%	22.4%
	2015	9.7%	18.8%	28.1%
	2020	10.8%	20.2%	33.7%

Table 38: % Enterprises providing other forms of CVT by year and NACE Rev.2 (weighted)

TYPE	YEAR	INDUSTRY	CONSTRUCTION	WHOLESALE & RETAIL TRADE, TRANSPORT, ACCOMMODATION & FOOD SERVICE ACTIVITIES	INFORMATION & COMMUNICATION; FINANCIAL & INSURANCE ACTIVITIES	REAL ESTATE ACTIVITIES; PROFESSIONAL, SCIENTIFIC & TECHNICAL ACTIVITIES; ADMINISTRATIVE & SUPPORT SERVICE ACTIVITIES; ARTS, ENTERTAINMENT & RECREATION; OTHER SERVICE ACTIVITIES
Guided-on-the-job training	2010	34.5%	30.7%	32.9%	44.3%	40.2%
	2015	44.6%	37.7%	42.1%	55.2%	51.8%
	2020	46.5%	38.8%	38.9%	56.9%	44.8%
Training at conferences, workshops, trade fairs and lectures	2010	30.5%	28.6%	29.5%	52.6%	44.3%
	2015	34.8%	33.1%	32.2%	61.8%	51.0%
	2020	26.4%	19.6%	22.9%	49.8%	40.2%
Self-directed learning	2010	9.7%	9.2%	13.9%	33.1%	19.2%
	2015	14.5%	13.4%	19.8%	47.3%	29.2%
	2020	25.8%	19.4%	24.7%	56.7%	35.6%
Job rotation, exchanges or secondments	2010	11.4%	5.5%	9.4%	13.6%	11.1%
	2015	14.5%	7.3%	11.4%	17.5%	13.0%
	2020	15.5%	8.3%	11.6%	17.5%	11.8%
Learning/quality circles	2010	8.6%	7.3%	8.5%	11.8%	11.5%
	2015	11.2%	7.0%	10.6%	17.4%	15.4%
	2020	12.3%	8.9%	10.8%	22.9%	17.1%

Table 39: Factors limiting provision of CVT activities over time (2010–2020) (weighted)

FACTOR	2010	2015	2020
No limitation: training level appropriate	54.4%	51.7%	40.1%
Recruits have necessary skills	44.7%	50.8%	41.1%
High workload and limited/no time for CVT	45.8%	43.9%	36.4%
High CVT courses costs	37.8%	34.1%	23.6%
Major recent CVT efforts made	28.3%	20.1%	17.4%
Other factors	14.7%	12.9%	39.0%
Lack of suitable CVT courses in the market	18.5%	15.9%	18.3%
Focus on IVT over CVT	17.2%	16.5%	15.1%
Difficult to assess enterprise's training needs	14.6%	13.3%	10.5%

Table 40: Size class disparities in factors limiting the provision of CVT activities among enterprises provided CVT training (2010-2020) (weighted)

FACTOR	YEAR	Small (10-49)	Medium (50-249)	Large (250+)
No limitation: training level appropriate	2010	56.5%	47.7%	43.7%
	2015	53.4%	46.5%	42.5%
	2020	42.1%	34.5%	29.6%
Recruits have necessary skills	2010	43.6%	48.4%	49.7%
	2015	49.8%	54.6%	54.4%
	2020	39.7%	45.9%	45.9%
High workload and limited/no time for CVT	2010	45.9%	46.2%	42.5%
	2015	44.1%	43.1%	43.5%
	2020	36.4%	36.0%	37.6%
High CVT courses costs	2010	37.6%	39.1%	36.3%
	2015	34.2%	33.6%	34.2%
	2020	23.2%	25.5%	22.7%
Major recent CVT efforts made	2010	28.6%	26.7%	29.5%
	2015	20.2%	19.6%	20.5%
	2020	16.4%	21.0%	20.7%
Other factors	2010	14.9%	14.1%	13.8%
	2015	13.5%	11.0%	10.4%
	2020	37.2%	43.2%	52.8%
Lack of suitable CVT courses in the market	2010	19.2%	16.1%	14.1%
	2015	16.5%	14.1%	12.1%
	2020	18.1%	19.5%	17.2%
Focus on IVT over CVT	2010	18.2%	14.6%	10.0%
	2015	16.9%	15.8%	13.1%
	2020	15.3%	15.0%	11.9%
Difficult to assess enterprise's training needs	2010	15.2%	13.2%	10.6%
	2015	13.8%	11.5%	10.9%
	2020	10.7%	10.1%	8.8%

Table 41: Economic activity disparities in factors limiting the provision of CVT activities among enterprises provided CVT training (2010-2020) (weighted)

FACTOR	YEAR	INDUSTRY	CONSTRUCTION	WHOLESALE & RETAIL TRADE, TRANSPORT, ACCOMMODATION & FOOD SERVICE ACTIVITIES	INFORMATION & COMMUNICATION; FINANCIAL & INSURANCE ACTIVITIES	REAL ESTATE ACTIVITIES; PROFESSIONAL, SCIENTIFIC & TECHNICAL ACTIVITIES; ADMINISTRATIVE & SUPPORT SERVICE ACTIVITIES; ARTS, ENTERTAINMENT & RECREATION; OTHER SERVICE ACTIVITIES
No limitation: training level appropriate	2010	52.9%	56.1%	54.8%	54.5%	54.2%
	2015	48.9%	50.0%	52.8%	50.6%	54.0%
	2020	39.0%	42.7%	42.1%	38.3%	37.5%
Recruits have necessary skills	2010	41.8%	40.8%	45.7%	47.0%	48.0%
	2015	46.1%	47.9%	51.5%	52.6%	55.6%
	2020	35.4%	37.9%	40.5%	45.6%	48.0%
High workload and limited/no time for CVT	2010	44.2%	46.3%	45.1%	46.5%	48.2%
	2015	42.3%	43.6%	43.7%	42.8%	46.3%
	2020	35.5%	35.7%	36.4%	41.5%	36.1%
High CVT courses costs	2010	37.1%	40.5%	37.3%	33.3%	39.1%
	2015	32.7%	33.6%	34.2%	32.0%	36.2%
	2020	23.3%	22.2%	23.7%	25.1%	24.2%
Major recent CVT efforts made	2010	30.2%	29.8%	26.8%	26.9%	27.9%
	2015	18.1%	23.8%	21.1%	16.9%	19.7%
	2020	16.3%	17.5%	17.1%	14.4%	19.8%
Other factors	2010	16.1%	15.9%	14.2%	13.5%	13.5%
	2015	13.2%	11.1%	14.8%	10.8%	11.4%
	2020	37.4%	34.9%	39.6%	40.1%	41.6%
Lack of suitable CVT courses in the market	2010	19.9%	18.4%	17.4%	16.2%	19.2%
	2015	17.1%	14.0%	15.5%	16.0%	16.1%
	2020	18.1%	18.9%	17.6%	17.4%	19.4%
Focus on IVT over CVT	2010	17.0%	20.4%	17.6%	12.6%	16.3%
	2015	17.3%	18.4%	17.6%	11.5%	14.6%
	2020	15.2%	21.8%	15.2%	12.8%	11.8%
Difficult to assess enterprise's training needs	2010	14.6%	13.6%	15.3%	11.8%	15.2%
	2015	11.4%	13.1%	14.4%	11.8%	14.0%
	2020	9.4%	10.2%	11.3%	10.3%	10.6%

Table 42: Reasons for the non-provision of CVT activities over time (2010–2020) (weighted)

REASON	2010	2015	2020
Existing skills meet enterprise needs	78.3%	82.9%	74.7%
Recruits have necessary skills	48.7%	55.2%	48.5%
High workload and limited/no time for CVT	31.8%	32.0%	30.5%
High CVT courses costs	31.7%	28.8%	23.4%
Focus on IVT over CVT	25.7%	26.0%	20.1%
Other reasons	16.5%	16.6%	30.4%
Difficult to assess enterprise's training needs	13.1%	17.0%	14.5%
Lack of suitable CVT courses in the market	13.2%	13.7%	14.8%
Major recent CVT efforts made	12.1%	14.2%	11.6%

Table 43: Size class disparities in reasons for non-provision of CVT activities among enterprises that did not provide CVT training (2010-2020) (weighted)

REASON	YEAR	Small (10-49)	Medium (50-249)	Large (250+)
Existing skills meet enterprise needs	2010	78.6%	75.6%	65.4%
	2015	83.1%	81.7%	70.0%
	2020	75.2%	70.4%	68.0%
Recruits have necessary skills	2010	47.8%	58.7%	53.9%
	2015	54.4%	62.6%	74.2%
	2020	47.8%	55.4%	55.0%
High workload and limited/no time for CVT	2010	31.6%	34.2%	31.9%
	2015	31.8%	33.7%	35.9%
	2020	30.7%	28.9%	28.2%
High CVT courses costs	2010	31.1%	37.2%	37.9%
	2015	28.5%	31.8%	29.6%
	2020	23.1%	26.6%	21.2%
Focus on IVT over CVT	2010	25.5%	27.9%	22.9%
	2015	25.9%	27.3%	26.0%
	2020	20.0%	20.8%	20.9%
Other reasons	2010	16.5%	17.2%	20.7%
	2015	16.8%	13.5%	12.9%
	2020	30.1%	33.2%	39.9%
Difficult to assess enterprise's training needs	2010	12.9%	14.4%	18.0%
	2015	16.9%	19.0%	15.3%
	2020	14.5%	13.6%	17.7%
Lack of suitable CVT courses in the market	2010	13.3%	12.5%	9.7%
	2015	13.8%	12.8%	12.1%
	2020	14.9%	14.1%	12.8%
Major recent CVT efforts made	2010	11.8%	14.8%	14.5%
	2015	14.4%	11.7%	12.6%
	2020	11.8%	9.5%	12.3%

Table 44: Economic activity disparities in reasons for non-provision of CVT activities among enterprises that did not provide CVT training (2010-2020) (weighted)

REASON	YEAR	INDUSTRY	CONSTRUCTION	WHOLESALE & RETAIL TRADE, TRANSPORT, ACCOMMODATION & FOOD SERVICE ACTIVITIES	INFORMATION & COMMUNICATION; FINANCIAL & INSURANCE ACTIVITIES	REAL ESTATE ACTIVITIES; PROFESSIONAL, SCIENTIFIC & TECHNICAL ACTIVITIES; ADMINISTRATIVE & SUPPORT SERVICE ACTIVITIES; ARTS, ENTERTAINMENT & RECREATION; OTHER SERVICE ACTIVITIES
Existing skills meet enterprise needs	2010	80.1%	80.0%	78.6%	79.4%	71.8%
	2015	81.9%	86.1%	83.2%	86.0%	80.7%
	2020	75.3%	79.6%	72.6%	72.8%	75.5%
Recruits have necessary skills	2010	44.1%	49.2%	50.1%	49.0%	53.5%
	2015	49.6%	60.2%	55.9%	61.9%	57.4%
	2020	44.7%	53.5%	48.2%	53.4%	48.4%
High workload and limited/no time for CVT	2010	30.1%	36.5%	30.7%	32.8%	33.4%
	2015	31.0%	40.7%	30.9%	32.6%	29.9%
	2020	31.9%	35.9%	28.8%	31.9%	28.6%
High CVT courses costs	2010	33.3%	34.2%	31.1%	26.3%	28.5%
	2015	28.3%	33.4%	28.5%	25.8%	27.0%
	2020	25.6%	24.6%	23.0%	20.6%	21.7%
Focus on IVT over CVT	2010	28.1%	32.1%	24.5%	19.9%	19.3%
	2015	24.4%	31.3%	24.0%	19.4%	31.1%
	2020	20.4%	25.8%	18.9%	16.8%	18.5%
Other reasons	2010	17.5%	13.8%	16.3%	13.4%	18.6%
	2015	16.0%	16.6%	16.0%	14.6%	19.2%
	2020	27.8%	30.1%	32.2%	31.1%	29.0%
Difficult to assess enterprise's training needs	2010	12.6%	12.5%	13.9%	11.0%	12.6%
	2015	14.5%	23.3%	15.1%	15.0%	21.9%
	2020	14.0%	14.2%	14.0%	11.1%	16.7%
Lack of suitable CVT courses in the market	2010	14.9%	11.7%	13.6%	12.0%	10.8%
	2015	15.0%	13.9%	12.1%	17.2%	14.8%
	2020	16.0%	16.9%	14.1%	13.6%	13.6%
Major recent CVT efforts made	2010	12.6%	16.2%	10.8%	12.1%	10.4%
	2015	13.2%	19.3%	13.7%	10.8%	13.9%
	2020	11.4%	15.2%	10.3%	14.3%	11.4%