



PANORAMA

Implications of demographic change for vocational education and training in the EU



Cedefop

Implications of demographic change for
vocational education and training in the EU

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Foreword

Demographic change is one of the main challenges that Europe will have to face over the next decades. Prevailing trends of decreasing birth rates and increasing life expectancy result in shrinking younger age cohorts and more older people. The predicted decline of Europe's population and its severe ageing will have considerable consequences on future labour supply and public spending (pensions, healthcare). A falling working-age population and state budget deficits might negatively affect potential economic growth rates and jeopardise the competitiveness of the European Union.

The demographic phenomenon and its impact on economies and societies has become an issue of growing concern at European Union level. The European Commission's *Green paper: confronting demographic change: a new solidarity between generations* of March 2005 (European Commission, 2005) initiated a major public debate on how to cope with the demographic challenge. The Commission's communication, *The demographic future of Europe – from challenge to opportunity* of October 2006 (European Commission, 2006), identified five key areas for policy response: births, employment levels, productivity growth, migration and sustainability of public finances.

Implications for vocational education and training seem particularly far reaching. By raising people's knowledge, skills and competences, vocational education and training can significantly contribute to improving employment participation and productivity of the European workforce (native population and migrants). Thus, it can play a vital role in alleviating potential negative effects of demographic developments.

The need to ensure more continuing training for adults and a growing number of older workers starts to attract due attention of policy-makers and researchers. Relatively little consideration, however, is given to the implications of demographic trends for initial vocational education and training.

This report aims to fill an identified information gap. It presents short-, medium- and long-term projections (with focus on the period up to 2030) of the future number of vocational education and training students and graduates, aged 15-24, in the 27 Member States of the European Union. The analysis is based on Eurostat population projections and, assuming unchanged participation and graduation rates, provides insight into the impact of pure demographic trends. The analysis reveals a falling number of young people in vocational education and training for several population scenarios. In the 'baseline scenario', the number of vocational education and training students at secondary, post-secondary and tertiary level decreases by more than two million between 2005 and 2030, with particularly significant decline at upper secondary level. The number of vocational education and training graduates is expected to decrease by 600 000 in the same period.

The report looks at the implications of these developments on vocational education and training teachers and trainers, explores to what extent contraction of training systems capacity is likely to take place and discusses consequences for the labour market. Lastly, different policy options to address identified challenges are proposed.

We hope that this publication will not only provide insight into potential implications of demographic decline for vocational education and training in the European Union but also encourage an in-depth public debate and further research on this topic. The existing differences between Member States with respect to population ageing call for identification of country-specific challenges and opportunities laid down by demographic change and designing adequate, constructive policy responses.

Aviana Bulgarelli
Cedefop Director

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- Cedefop, Patrycja Lipińska who was responsible for the overall management of the project and Manfred Tessaring who supervised publication;
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Executive summary

Context and objective

Demographic change, alongside globalisation and technological progress, is a challenge requiring immediate action if the European Union (EU) is to achieve the Lisbon objective of a competitive knowledge-based economy and socially cohesive society. The ever-increasing ageing of European population calls for new forms of solidarity among generations (EC, 2005; 2006; 2007). This includes tapping the labour potential of people throughout their lives, improving quality of work, investment in human capital and equal opportunities as well as modernisation of social protection systems.

It is widely acknowledged that vocational education and training (VET) has a key role to play in alleviating potential negative effects that demographic change can have on EU economies and societies. Increasing labour-force participation and productivity by developing measures which encourage ‘active ageing’ and ‘learning ageing’ – including continuing vocational training – is high on the policy and research agenda. Relatively little attention is given, however, to the impact of demographic trends on initial VET (IVET), although in the long- and medium-term it will have dramatic implications on the future supply of skilled workers. This publication aims to provide insight into the future supply of young VET students and graduates and resulting from it teaching staff and infrastructure requirements as well as labour market consequences. With this analysis, Cedefop intends to promote informed and constructive debate on the implications of demographic change for VET in the EU and contribute to evidence-based policy-making, both at European and national levels.

Methods and data

The report provides short-, medium- and long-term projections (for the period 2005 to 2050, focusing in particular on 2030) of the future number of VET students and graduates for all Member States (EU-27). The analysis centres on young cohorts, aged 15-24 and covers ISCED levels 2-5.

The analysis concentrates on the impact of pure demographic trends. The projection model – participation ratio method – combines Eurostat population projections (base year 2004) with observed VET participation and graduation rates. The data on VET are primarily derived from the Eurostat database. The observed participation rates, averaged by (single) age, gender, ISCED level and programme orientation (prevocational and vocational) over the period 1998-2004 (for which historical time series are available) are kept constant over the whole projection period. Time series did not show clear trends and did not allow extrapolating historical trends other than keeping rates stable. Similarly graduation rates remain unchanged.

To project the impact that future young VET students numbers will have on the number of teachers required in IVET, the model was extended with constant teacher/student ratios. Eurostat data were used, however, no consistent data on the number of teaching staff by programme orientation are available. To explore labour-market consequences, the projected supply of VET graduates is compared with future employment trends, the latter estimated on the basis of the European Commission's long-term labour force projection (Carone, 2005).

Several scenarios are analysed with respect to the future supply of VET students and graduates. The baseline ⁽¹⁾ (applied for the EU as a whole and all Member States separately), high population ⁽²⁾ and low population ⁽³⁾ scenarios (applied for the EU as a whole only) assume no change in existing policies which would affect participation and/or graduation rates and thus, demonstrate the effects of different demographic assumptions only. A normative scenario examines the possibility of keeping the current level of VET students in the future.

Key findings and policy implications

The projections reveal declining numbers of VET students and graduates in EU-27 resulting from demographic trends. If participation rates remain unchanged, the number of students in prevocational and vocational streams at ISCED 2-5, is expected to decrease from 14.2 million in 2005 to 11.9 million in 2030, a decline of 17 %, according to the Eurostat baseline variant. In the high population and low population variants the number of students will fall to 13.7 and 10.2 million respectively.

Within education levels and within age groups the changes are similar to overall trends. The decrease of VET students is expected to be particularly significant at upper secondary level (ISCED 3) in absolute numbers: from 11.5 million in 2005 to 9.6 million in 2030, a decline of almost 2 million (baseline variant). Especially in the period 2009-15 the decline is sharp.

In Germany and newer Member States the number of VET students at ISCED 2-5 is likely to decrease substantially, altogether by 1.7 million. This accounts for 73 % of the total decline in the EU by 2030. In absolute numbers Germany and Poland are expected to have the largest decrease: 478 000 and 500 000 respectively. Only a few countries, such as Denmark, Ireland and Luxembourg are expected to experience a growth of VET students by 2030.

Assuming constant graduation rates, the number of graduates in IVET will decline in line with the number of VET students. For 2030, the baseline variant foresees 600 000 graduates (ISCED 3-5) less than in 2005.

⁽¹⁾ Assumptions: gradual rise of the total fertility rate, a continuing increase of life expectancy and a surplus net migration in the future.

⁽²⁾ Assumptions: high fertility rates, high life expectancy, high net migration.

⁽³⁾ Assumptions: low fertility rates, low life expectancy, low net migration.

The projected decrease in the number of students means that a lower number of teachers and trainers may be required, if student/teacher ratios remain the same. Assuming student/teacher ratios are similar for both, general and vocational streams, it is estimated that 150 000 less teaching staff (in full-time units) may be needed in IVET in 2030 at ISCED 3, compared to 2005. However, despite this projected decrease in VET teachers, in some Member States there will still be demand for this profession due to replacement demand (to replace those leaving for retirement or other reasons).

Similarly, reduced numbers of VET students may have an impact on the infrastructure needed for IVET in the future in terms of type, size and number of facilities. This might affect the organisation of institutions.

Trying to keep the number of students at current levels – thus preventing potential contraction of the current IVET system capacity – would require a 20 % increase of participation rates in IVET around 2030, according to the baseline scenario. Since education participation rates are already rather high, particularly in the 15-19 age group, this would mean a substantial shift of enrolment from general to prevocational and vocational streams.

Smaller future numbers of VET graduates will mean fewer entrants with VET qualifications into the labour market. Whether and to what extent labour-market shortages will come to pass in future is difficult to foresee. Comparing projected supply of VET graduates with projected employment trends⁽⁴⁾ shows that some countries, for example Lithuania, Luxembourg, Poland, Romania, Slovakia, Sweden, as well as the EU as a whole, are expected to experience a higher decline of VET graduates compared to projected employment growth in both 2020 and 2030, which might indicate potential labour-market shortages for people with these qualifications. In other countries, such as the Czech Republic, Ireland, Spain, Greece, Portugal and Slovenia, the future supply of VET graduates is increasing more compared to employment growth in both 2020 and 2030.

The strong demographic changes, which will affect the labour force considerably, cannot be easily overcome. Basically, there are only a few options, such as increasing birth rates, increasing immigration and increasing labour-force participation.

Of the available policy options, current evidence suggests that increasing birth rates is the most unlikely to succeed. Increasing immigration could not be a panacea for ageing: migration flows would need to be very large and come from outside Europe if the current age structure is to be maintained. However, migration could serve as a policy option aiming at balancing short-term shortages on labour markets. Since immigrants are generally found to have lower employment and higher unemployment rates than the native population, often due to lack of adequate skills and language competences, there is a key role for VET to support immigrants in their upskilling and provide tailored guidance and counselling and training opportunities. Increasing labour-force participation would need to focus on those groups with currently

⁽⁴⁾ Estimated based on the European Commission's long-term labour force projections, Carone 2005.

lower labour-force participation, especially young people, women, older workers, migrants. However, increasing labour-force participation rates of young people might decrease education and training participation rates, with a negative effect on enrolment in IVET. Thus, policies aiming at increasing labour-force participation of women, older workers and migrants may be the most effective in curbing the repercussions of demographic change. The need for continuing VET and lifelong learning programmes can be expected to expand considerably. The challenge for European VET will be to target the diversified groups adequately. More flexible arrangements for shorter courses, refresher courses, more on the job training and better arrangements to combine (part-time) jobs, education and childcare could help to serve better the needs of these groups.

The demographic change should not be seen only as a threat or risk, as it might also yield new opportunities. Budget relief caused by reduced numbers of students could be used to improve quality and effectiveness of VET systems. This might include increased and targeted learner support, smaller student/teacher ratios, more and better teacher and trainer training throughout their careers, better buildings and technological equipment. Further, more training could be provided to specific groups, underrepresented in training and/or employment participation. Demographic change offers an unprecedented opportunity to deepen rather than widen investment in human capital. Ways should be sought and constructive policies designed to bring positive results from the current and future demographic trends.

Defining VET

Vocational education and training (VET) comprises all more or less organised or structured activities that aim to provide people with the knowledge, skills and competences necessary to perform a job or a set of jobs, whether or not they lead to a formal qualification. VET is independent of venue, age or other characteristics of participants and previous level of qualifications. VET may be job-specific or directed at a broader range of occupations. It may also include elements of general education.

VET takes various forms in different countries and also within a given country. Initial VET (IVET) can be school-based, enterprise-based, or a combination of both (as in the dual system). It can be organised as prevocational training to prepare young people for transition to a VET programme. Completion of VET at upper secondary level normally leads to a certificate and qualifies for access to a skilled job as well as access to post-secondary, and sometimes higher education. VET at post-secondary level provides access to higher skilled jobs (master or technician) and can also open the way to higher education. Vocationally-oriented programmes, leading to a labour-market relevant qualification are also offered at tertiary level. The European qualifications framework relates VET to each of its eight reference levels.

Continuing vocational training (CVT) takes multiple forms, ranging from short training courses to participation in advanced and longer programmes. CVT can be organised by (networks of) companies, social partners organisations, and local, regional and state bodies. Participants include employees, unemployed people or those returning to the labour market.

This report centres on IVET covering prevocational and vocational programmes at the following educational levels (according to the International standard classification of education – ISCED):

ISCED 2 – lower-secondary education (⁵);

ISCED 3 – upper-secondary education;

ISCED 4 – post secondary education;

ISCED 5 – in the analysis understood as 5B, first stage of tertiary education.

For a more detailed description of ISCED levels and programme orientation, refer to Annex A or Unesco, 2006.

⁵ At ISCED 2 there are mainly prevocational programmes.

1. Introduction

In the years to come Europe will increasingly be confronted with an ageing population and most likely – population decline. The size of older age cohorts is expected to rise considerably both, in relative and absolute terms. According to Eurostat baseline projections (Eurostat, 2006; Lanzieri, 2006), in the 27 Member States of the European Union (EU-27) the number of elderly aged 65 and over will increase from 81 million (around 17 % of the total population) in 2005 to 112 million (23 %) around 2025 and to 141 million (30 %) around the year 2050. At the same time, due to birth rate decline, the EU will experience a significant decrease of younger age population. The large size differences between the older and younger cohorts will drastically change the future age structure of the EU's labour force.

Although population ageing is one of the most distinctive demographic events of the past several decades (Beets, 2006) it has received public policy interest much more recently, particularly since it is expected to affect the labour market and consequently economic growth.

There is widespread belief that vocational education and training (VET) can mitigate the potential negative effects of shrinking working-age population. Surprisingly, little consideration is given to the impact of demographic trends on initial vocational education and training (IVET), preparing young people to enter the labour market. This report aims to provide insight into this topic.

1.1. Aim of the report

This report provides insight into the implications of current and future demographic trends for IVET in EU-27, in a few scenarios. The report primarily seeks to answer the following questions:

- (a) how will demographic trends affect future numbers of students and graduates of IVET?
- (b) what are the implications for teaching staff in IVET?
- (c) what impact will the future number of IVET participants have on training infrastructure, developed in a very different demographic context? To what extent is a contraction of the VET system capacity likely to take place?

Second, the report can serve as a starting point to explore questions such as:

- (a) how will future young cohorts with VET qualifications affect the labour force?
- (b) to what extent may migration compensate for the potentially decreasing number of labour-market entrants with VET qualifications in the EU?

1.2. Approach

The report consists of the following parts:

- (a) a description and country comparison of demographic trends with particular focus on younger cohorts;
- (b) a description and country comparison of the current situation in IVET (key figures);
- (c) a description of applied methodology;
- (d) a projection of future number of students and graduates in IVET and brief analysis of the consequences for teaching staff and the labour market;
- (e) a summary of results and discussion of implications for (initial) VET in Europe.

The first part illustrates current and future demographic trends in the EU, with particular focus on younger cohorts, aged 15 to 24. The results of different variants of Eurostat population projections (Eurostat, 2006) for the EU as a whole are presented. The results of baseline Eurostat population projections for each Member State are also illustrated. Additionally some comparisons with selected non-EU countries are made.

The second part examines the current situation in IVET in the EU. The key figures are presented with respect to: distribution of students between general, prevocational and vocational streams, gender differences, participation rates, fields of education and teaching staff. The analysis centres on ISCED levels 2 to 5 (Annex A).

The third part outlines the methodology applied to project the future number of students, graduates and teaching staff in IVET. The participation ratio method is described and information on data used is given. The section also explains the assumptions and alternative scenarios on which the projections are based.

In the fourth part results of the ‘baseline scenario’ projection of future numbers of students and graduates in IVET are presented for all Member States. These results are compared both with the current situation and the outcomes of three ‘alternative scenarios’ projections for the EU as a whole. The consequences for teaching staff and the labour force are also explored (according to the ‘baseline scenario’). The report presents projections for the period up to 2050, however, discussion of results focuses on the period up to 2030.

The final part summarises the main findings and discusses the implications for (initial) VET. Using the results of previous analysis, the report will identify and qualitatively examine challenges that VET is likely to face and potential opportunities offered by demographic change.

2. Demographic trends

Europe will most likely face population decline and severe population ageing in the near future. As a result of decline and postponement of births and a further rise in life expectancy, the population size of the EU will come to a maximum around 2020-25 and then decline. This process started, more or less, in the northern part of Europe, ‘travelled’ to the west, and then to the southern part. After the fall of the Berlin wall the eastern part also ‘adopted’ this pattern although the change to a free market economy had an effect there as well (Beets, 2006).

Currently, the EU is characterised by low and late fertility, as well as low and late mortality. Although Europe will be more heavily affected by population ageing in the coming decades than other parts of the world there is much variation in the ageing process within Europe.

With respect to IVET, population trends in the 15-24 age group are of particular interest. Most students in IVET are enrolled in upper secondary education, ISCED level 3, of which most students are in this age group (Table 1). Therefore, this chapter will deal with future population trends in the EU, particularly focusing on the 15-24 age group. Some comparisons will also be made with countries outside the EU.

Table 1: Students in VET by ISCED level, educational stream and age group, EU-27, 2004

ISCED level	Educational stream (millions)			Age distribution (%)			
	Total	Prevocational	Vocational	10-14	15-19	20-24	25-29
2	0.7	0.4	0.3	78.7	19.8	0.3	0.2
3	15.5	1.2	14.3	6.4	68.5	8.7	2.9
4	1.2	–	1.2	0.0	30.4	51.4	3.7
5	2.5	–	2.5	0.0	20.8	42.6	11.4

Source: NIDI calculations based on Eurostat.

2.1. General trends

Based on past trends, analysis of driving forces and expert opinion, Eurostat has produced population projections for each of the EU-27 Member States. The set of population projections comprise seven variants: ‘baseline’, ‘high population’, ‘low population’, ‘younger age profile population’, ‘older age profile population’, ‘high fertility’ and ‘zero migration’ starting from the base year 2004. All these variants must be interpreted as possible alternative developments in population except the latter, a reference scenario, which helps in understanding the role played by migration in the evolution of population size and structure (for a more detailed discussion see Lanzieri, 2006).

The ‘baseline’ variant assumes a gradual rise in the total fertility rate, a continuing increase of life expectancy and a surplus net migration in the future. In the ‘high population’ and ‘low

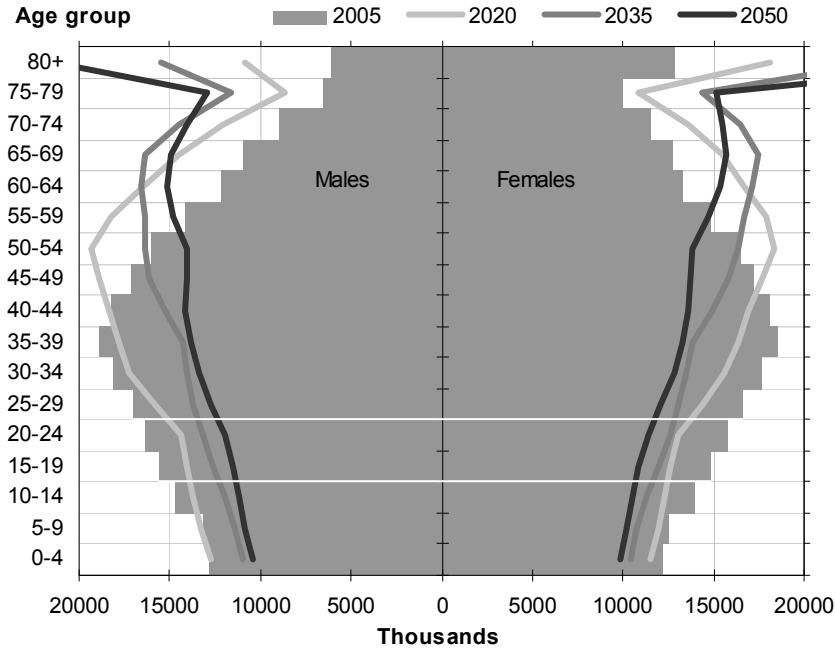
population’ variants the assumptions all work together in the same direction for the increase or decrease of the population, that is either a higher increase of the total fertility rate combined with a higher increase in life expectancy and higher net migration or a total fertility rate decrease combined with a lower increase of life expectancy and lower net migration (Table 2). All other Eurostat population projection variants fall in between. Most of the variants show a decline in population of the EU in the first half of this century. For the ‘baseline’, ‘high population’ and ‘low population’ variants, summary country-specific assumptions with respect to future trends in total fertility rates, life expectancy and net-migration are available in Table B1 to B3 in Annex B.

Table 2: Assumptions for the variants of Eurostat long-term population projections

Scenario	Total fertility rate	Life expectancy	Net migration
Baseline	base	base	base
Low population	low	low	low
High population	high	high	high
Young population	high	low	high
Old population	low	high	low
High fertility	high	base	base
Zero migration	base	base	zero

Source: Lanzieri (2006).

Figure 1: Projected population by gender and age group in 2005, 2020, 2035 and 2050, baseline variant, EU-27



Source: Eurostat (2006).

In the ‘baseline’ variant the total population in EU-27 will gradually increase from 488 to a maximum of 496 million in the year 2022. After that the population is expected to decline to 472 million around the year 2050; slightly below the current population size. The ageing of the EU population is reflected in the age pyramids presented in Figure 1. As can be seen from the figure, compared to the situation in 2005, in future the population in the bottom half of the pyramid (younger age groups) will decrease whereas the population in the upper half of the pyramid (older age groups) will increase. Thus, the situation of younger cohorts is quite different from the older ones.

2.2. Age-specific trends

According to the Eurostat ‘baseline’ variant the population in the 15-24 age group in EU-27 decreases from 62 million in 2005 to 51 million in 2030, a decline of 17 %. In 2050 the population aged 15-24 might even further decline to 46 million, more than a quarter lower than in 2005 (Figures 2 and 3).

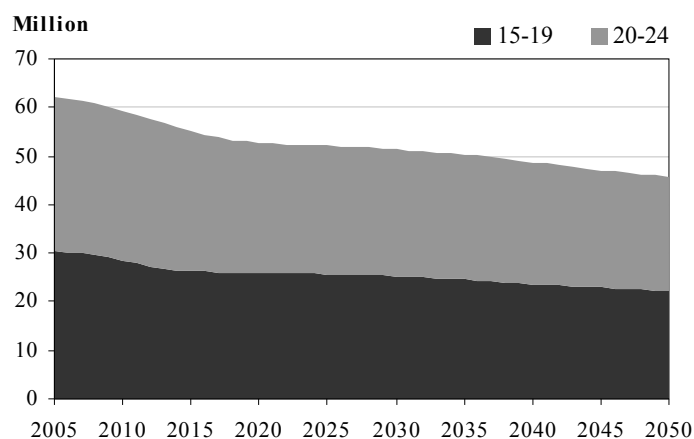
The projection results of the ‘low population’ variant show a larger decrease of the 15-24 age group than the ‘baseline’ variant: a decline to 42 million in 2030 (33 % lower than in 2005) and even further to 36 million in 2050 (42 % lower than in 2005). The ‘high population’ variant shows a lesser decrease to 54 million in 2020 and a recovery to 59 million at the end of the projection period in 2050 (Tables 3 and 4). Due to similar assumptions on fertility the ‘old population’ and ‘young population’ variants produce more or less the same outcomes for the 15-24 age group as the ‘low population’ and ‘high population’ variants respectively. The ‘high fertility’ and ‘zero migration’ variants end up in between: the outcomes of the ‘high fertility’ variant seek the direction of the ‘high population’ variant, whereas the outcomes of the ‘zero migration’ variant move in the direction of the ‘low population’ variant.

Table 3: Projected population in the 15-24 age group by Eurostat population projection variant, EU-27, 2005-50 (000s)

Scenario	2005	2010	2015	2020	2030	2050
Baseline	62 268	59 364	55 229	52 694	51 446	45 761
Low population		58 878	54 496	51 578	41 858	35 946
High population		59 856	56 042	53 961	60 360	59 270
Young population		59 849	56 028	53 939	60 265	59 123
Old population		58 885	54 509	51 599	41 924	36 036
High fertility		59 364	55 229	52 851	57 379	54 596
Zero migration		58 045	53 325	50 316	45 655	39 334

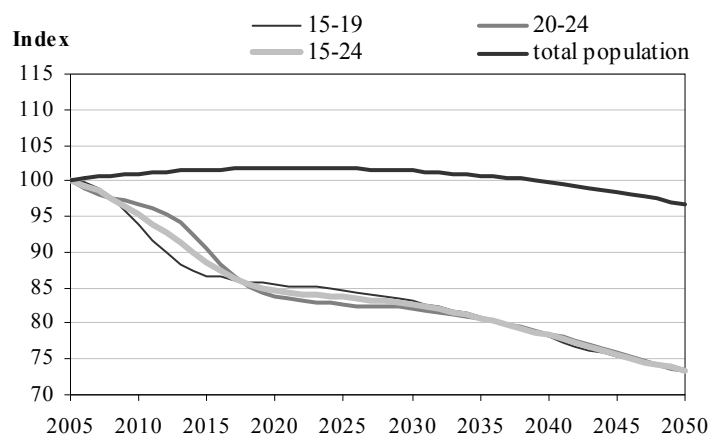
Source: Eurostat (2006).

Figure 2: Projected population in the 15-24 age group, baseline variant, EU-27, 2005-50



Source: Eurostat (2006).

Figure 3: Index of the projected population in the 15-24 age group, baseline variant, EU-27, 2005-50 (2005=100)



Source: NIDI calculations based on Eurostat (2006).

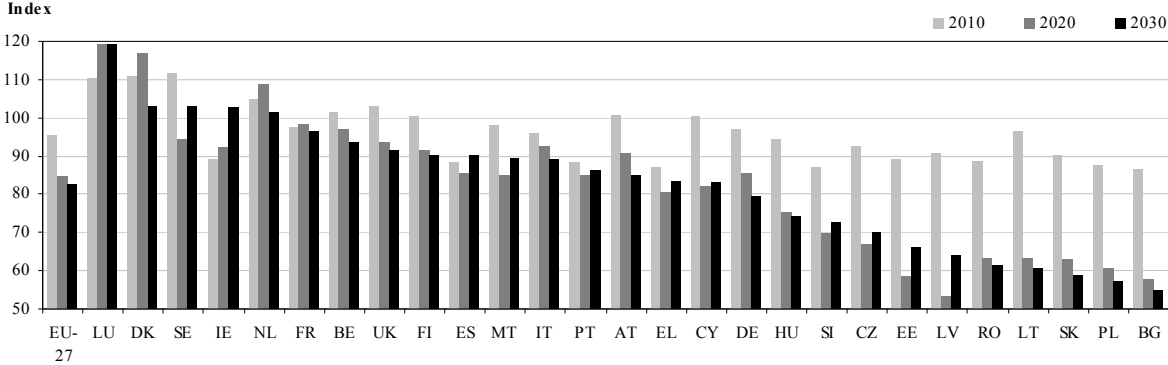
Table 4: Index of the projected population in the 15-24 age group, by Eurostat population projection variant, EU-27, 2005-50 (2005=100)

Scenario	2005	2010	2015	2020	2030	2050
Baseline	100	95	89	85	83	73
Low population		95	88	83	67	58
High population		96	90	87	97	95
Young population		96	90	87	97	95
Old population		95	88	83	67	58
High fertility		95	89	85	92	88
Zero migration		93	86	81	73	63

Source: NIDI calculations based on Eurostat (2006).

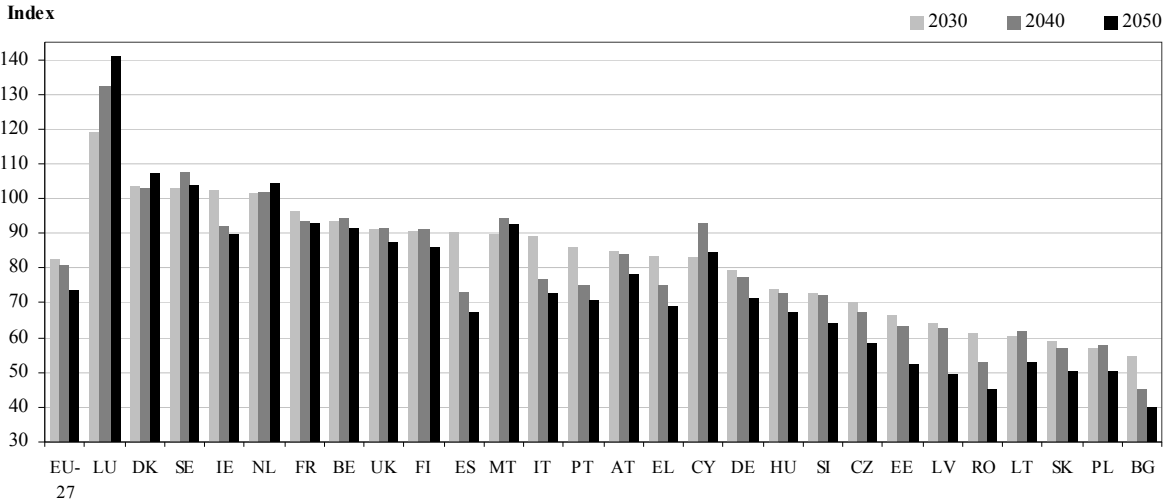
Taking the ‘baseline’ variant as a reference in the long-term, 11 ⁽⁶⁾ of EU-27 Member States are expected to have growth of the total population at the end of the projection period (2050). Newer Member States are expected instead to show a considerable decrease in their populations. Mediterranean countries are expected to face the major challenges of an ageing population, especially in the second half of the projection period, while other countries, such as Luxembourg and the Netherlands, will observe a much less significant change. Similar patterns can be observed from the country-specific population projection results for the 15-24 age group (Tables 5 and 6 and Figures 4 and 5). For instance, only five of EU-27 Member States are expected to have a (slight) growth of the population aged 15-24 in 2030: Denmark, Ireland, Luxembourg, the Netherlands and Sweden. Newer Member States in particular are expected to show a considerable decrease in their populations aged 15-24. In Bulgaria, Poland and Slovakia the population in the 15-24 age group is expected to decrease by over 40 % in 2030.

Figure 4: Index of the projected population in the 15-24 age group, by Member State (EU-27) in 2010, 2020 and 2030, baseline variant (2005=100)



Source: NIDI calculations based on Eurostat (2006).

Figure 5: Index of the projected population in the 15-24 age group, by Member State (EU-27) in 2030, 2040 and 2050, baseline variant (2005=100)



Source: NIDI calculations based on Eurostat (2006).

⁽⁶⁾ Belgium, Denmark, Ireland, France, Cyprus, Luxembourg, Malta, the Netherlands, Austria, Sweden and the UK.

Table 5: Projected population in the 15-24 age group, by Member State (EU-27), 2005-50, baseline variant (000s)

	2005	2010	2015	2020	2030	2050
EU-27	62 268	59 364	55 229	52 694	51 446	45 761
Belgium	1 259	1 279	1 265	1 222	1 178	1 153
Bulgaria	1 055	913	709	609	577	420
Czech Republic	1 363	1 265	1 058	913	955	798
Denmark	596	660	707	695	615	638
Germany	9 680	9 382	8 757	8 262	7 688	6 879
Estonia	210	187	140	122	139	109
Ireland	626	558	544	578	642	559
Greece	1 377	1 199	1 132	1 107	1 149	949
Spain	5 236	4 616	4 359	4 462	4 715	3 517
France	7 804	7 612	7 468	7 676	7 521	7 251
Italy	6 110	5 846	5 703	5 663	5 444	4 440
Cyprus	116	116	109	95	96	98
Latvia	360	326	235	191	230	177
Lithuania	529	510	420	334	320	280
Luxembourg	53	58	62	63	63	74
Hungary	1 321	1 246	1 119	994	980	893
Malta	59	57	54	50	53	54
Netherlands	1 951	2 045	2 092	2 123	1 979	2 034
Austria	997	1 005	978	903	846	781
Poland	6 285	5 489	4 542	3 809	3 595	3 172
Portugal	1 327	1 171	1 119	1 127	1 142	935
Romania	3 360	2 981	2 345	2 126	2 062	1 523
Slovenia	269	234	201	188	195	173
Slovakia	868	783	655	547	511	438
Finland	651	652	638	595	589	558
Sweden	1 097	1 222	1 148	1 036	1 130	1 138
UK	7 709	7 953	7 670	7 205	7 033	6 720
EU-27 total population	487 881	492 838	495 353	49 6408	494 784	472 050

Source: Eurostat (2006).

Table 6: Index of the projected population in the 15-24 age group, by Member State (EU-27), 2010-50, baseline variant (2005=100)

	2005	2010	2015	2020	2030	2050
EU-27	100	95	89	85	83	73
Belgium	100	102	100	97	94	92
Bulgaria	100	87	67	58	55	40
Czech Republic	100	93	78	67	70	59
Denmark	100	111	119	117	103	107
Germany	100	97	90	85	79	71
Estonia	100	89	67	58	66	52
Ireland	100	89	87	92	103	89
Greece	100	87	82	80	83	69
Spain	100	88	83	85	90	67
France	100	98	96	98	96	93
Italy	100	96	93	93	89	73
Cyprus	100	100	94	82	83	84
Latvia	100	91	66	53	64	49
Lithuania	100	96	79	63	60	53
Luxembourg	100	110	118	119	119	141
Hungary	100	94	85	75	74	68
Malta	100	98	93	85	90	92
Netherlands	100	105	107	109	101	104
Austria	100	101	98	90	85	78
Poland	100	87	72	61	57	50
Portugal	100	88	84	85	86	70
Romania	100	89	70	63	61	45
Slovenia	100	87	75	70	72	64
Slovakia	100	90	76	63	59	50
Finland	100	100	98	91	90	86
Sweden	100	111	105	94	103	104
UK	100	103	99	93	91	87
EU-27 total population	100	101	102	102	101	97

Source: NIDI calculations based on Eurostat (2006).

2.3. The EU compared to non-EU countries

From a worldwide perspective demographic trends in Europe are rather unique, since Europe will be the first continent to face a population decline and severe population ageing in the near future compared to other continents (Beets, 2006). The previous section showed the consequences of demographic trends for the age group of interest to IVET. This will probably affect the position of the EU in a global context, for instance with respect to labour-market

developments and global competition. Tables 7 and 8 present population projection outcomes for some other countries compared to the EU, for the 15-24 age group as presented in the previous sections. Population projections for the other countries originate from the latest available medium population variant of the 2006 revision of the United Nations world population projections⁽⁷⁾. In the medium population variant of the United Nations total fertility in all countries is assumed to converge eventually towards a level of 1.85 children per woman. However, not all countries reach this level during the projection period, that is, by 2045-50 (in particular very low fertility countries such as Japan, the Russian Federation and South Korea). Mortality in these United Nations projections is projected by selection of models of change of life expectancy for each country based on recent trends in life expectancy by gender. These models produce smaller gains the higher the life expectancy already reached. The future path of international migration is set based on past international migration estimates and assessment of the policy stance of countries on future international migration flows.

Tables 7 and 8 show large differences between countries. The demographic trends for the 15-24 age group in China and Japan are more or less in line with trends in the EU. In both countries the size of the 15-24 age group is expected to decline by around 20 % in 2020 compared to 2005. After 2020 the decline in Japan is stronger than in the EU. Both the Russian Federation and South Korea are expected to have a stronger decline of the 15-24 age group in 2030 than the EU as a whole, due to very low fertility rates, much more in line with trends in newer Member States. At the other end, Australia, India and the US are expected to see an increase in the population of the 15-24 age group in 2030. In the long term, up to 2050, only Australia, Canada and the US, the traditional immigration countries, are expected to see an increase in size of this group.

The differences between countries are mainly explained by the differences in fertility and net migration trends both in the past and assumed in the future (for summary assumptions of the medium population variant of the United Nations see Table B4 in Annex B). Though fertility rates in countries such as India and Turkey are, in the long term, expected to converge to the same level as in other countries (below replacement level), their current fertility rates are much higher than in other countries, therefore still resulting in larger younger cohorts. Fertility rates in Australia and Canada are more comparable to the EU, but immigration (relative to their population size) is much higher in these countries: 4.0 net immigrants per 1 000 inhabitants in Australia, 5.1 per 1 000 in Canada and 1.7 per 1 000 in the EU around the year 2030. In the US both fertility (converging from around replacement level to 1.85) and net migration (from 4.3 to 3.0 per 1 000 inhabitants) are higher than in the EU.

⁽⁷⁾ Available from Internet: <http://esa.un.org/unpp/index.asp> [cited 21.8.2008].

Table 7: Projected population in the 15-24 age group in EU-27 and selected non-EU countries, 2005-50, Eurostat baseline variant and United Nations medium population variant (million)

	2005	2010	2015	2020	2030	2050
EU-27	62.3	59.4	55.2	52.7	51.4	45.8
Australia	2.8	2.9	2.9	2.9	3.0	3.2
Brazil	35.3	33.7	33.6	34.9	35.0	31.4
Canada	4.3	4.5	4.4	4.1	4.2	4.6
China	217.4	219.0	197.0	178.8	170.8	153.2
India	218.7	235.1	244.1	245.6	245.4	210.6
Japan	14.1	12.6	12.2	11.9	10.2	8.4
Russian Federation	24.5	20.2	14.7	13.6	14.6	10.9
South Korea	7.0	6.6	6.5	5.5	4.3	3.4
Turkey	13.6	13.7	13.9	13.6	13.3	12.0
USA	42.8	45.1	45.1	45.0	47.8	48.3

Source: Eurostat (2006), United Nations (2007).

Table 8: Index of the projected population in the 15-24 age group, in EU-27 and selected non-EU countries, 2005-50, Eurostat baseline variant and United Nations medium population variant (2005=100)

	2005	2010	2015	2020	2030	2050
EU-27	100	95	89	85	83	73
Australia	100	104	104	102	105	114
Brazil	100	95	95	99	99	89
Canada	100	104	101	95	96	106
China	100	101	91	82	79	70
India	100	107	112	112	112	96
Japan	100	90	86	84	72	60
Russian Federation	100	82	60	55	60	44
South Korea	100	95	93	79	62	49
Turkey	100	100	102	100	98	88
USA	100	106	106	105	112	113

Source: NIDI calculations based on Eurostat (2006) and United Nations (2007).

3. Key figures on initial vocational education and training

This chapter presents some key figures on IVET, that is prevocational and vocational programmes at ISCED 2-5, in the EU (see Annex A and Unesco, 2006 for a detailed description of educational levels and programme orientation). The following aspects are dealt with: distribution of students between general, prevocational and vocational streams, gender differences, education participation rates, fields of education and teaching staff.

3.1. General and vocational education and training

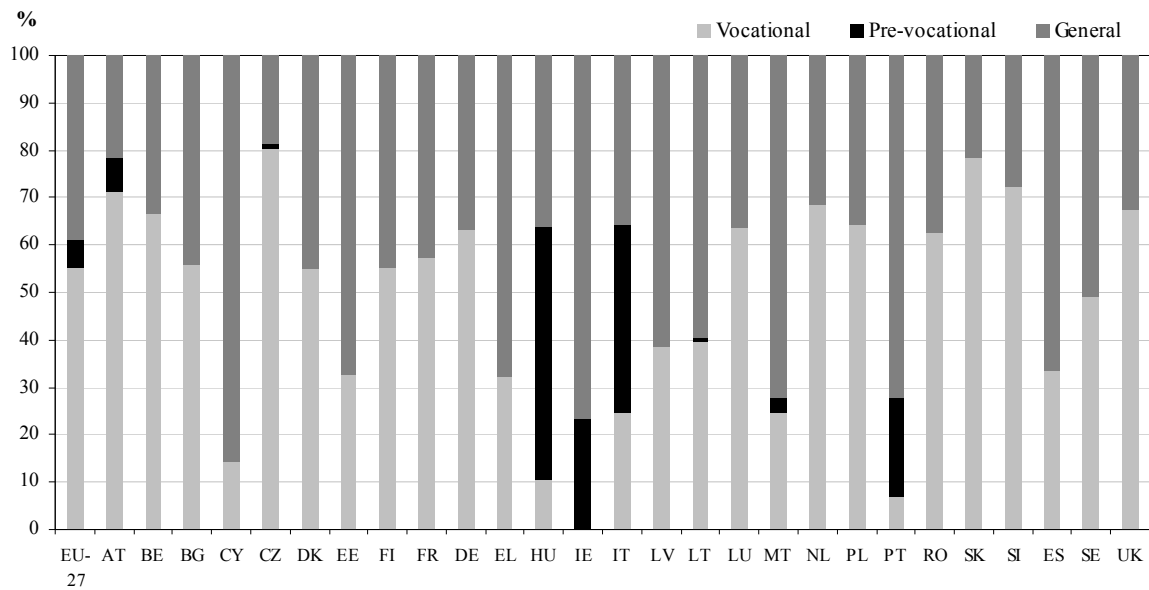
In EU-27 the total number of students at ISCED 2-5 was around 68 million in 2004. This is an increase of around 4.1 million students, 6.3 %, since 2000. The majority of the students in 2004 were in general educational streams: around 71 % in general, 2 % in prevocational and 27 % in vocational streams. Since 2000 the percentage in vocational streams slightly decreased by 0.3 percentage points. Of all the students in vocational streams 78 %, 14.3 million persons, are in upper secondary education (ISCED 3).

Overall, at upper secondary level a larger proportion of students enrol in prevocational and vocational streams than in general education. In the EU as a whole in 2004 around 61 % of students enrolled in prevocational and vocational streams against 39 % in general streams. These proportions have remained stable since 2000 (Figures 6 and 7).

The distribution over general, prevocational and vocational streams (ISCED 2-5) is rather diversified between countries. More than two thirds of students, in both 2000 and 2004, were in prevocational and vocational streams in Belgium, the Czech Republic, the Netherlands, Austria, Slovenia, Slovakia and the UK. On the other hand, more than two thirds of students, in both 2000 and 2004, were in general streams in Estonia, Ireland, Cyprus and Hungary. Particularly, Denmark, Lithuania and Poland showed relatively large decreases in the proportion of students in prevocational and vocational streams in that period.

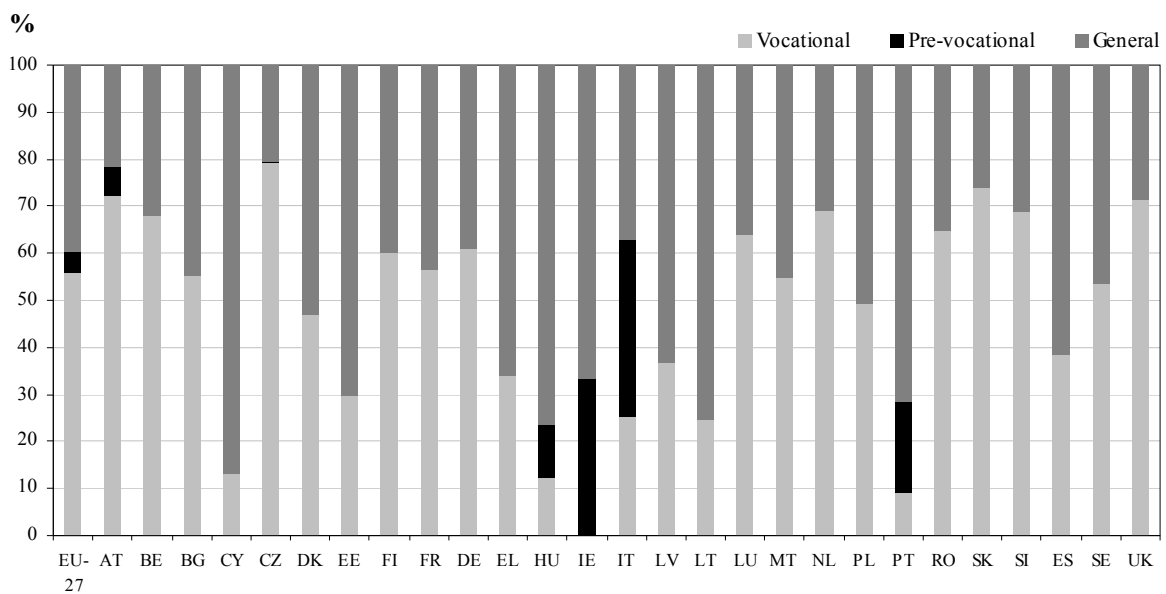
In the period 1999-2004 the percentage of students in prevocational and vocational streams of all students at various ISCED levels appears to range from rather stable to just slightly decreasing in EU-27 (and thus rather stable and slightly increasing in general streams) (Figure 8).

Figure 6: Distribution of students at ISCED 3 in general, prevocational and vocational streams, EU-27, 2000 (%)



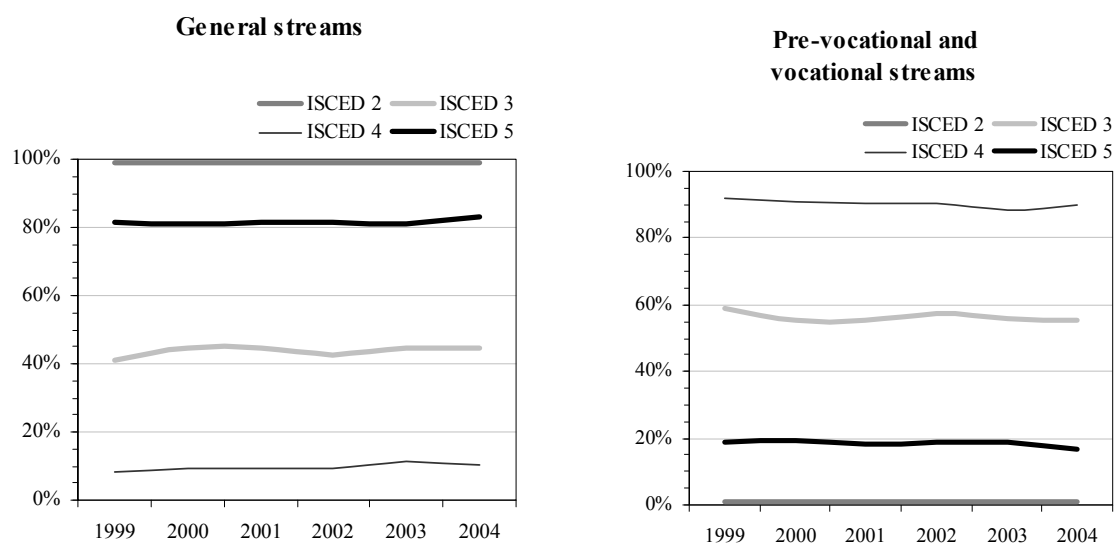
Source: NIDI calculations based on Eurostat.

Figure 7: Distribution of ISCED 3 students in general, prevocational and vocational streams, EU-27, 2004 (%)



Source: NIDI calculations based on Eurostat.

Figure 8: Percentage of students by educational stream and ISCED level, EU-27, 1999-2004



Source: NIDI calculations based on Eurostat.

3.2. Gender

In the EU as a whole the proportions of males and females in VET are exactly the same: females caught up from 48 % in 2000 to 50 % in 2004. However, in most countries still slightly more males than females are in prevocational and vocational streams. The only exceptions are Belgium, Estonia, Lithuania, Sweden and the UK. Actually, differences between 2000 and 2004 are rather small (Tables 9 and 10 and Figures 9 and 10).

At tertiary level (ISCED 5), females in general outweigh males, except for Denmark, Greece, Cyprus, Finland and Sweden.

Table 9: Distribution of students in prevocational and vocational streams by ISCED level and gender, EU-27, 2000 (%; all students at a particular ISCED level=100 %)

	ISCED 2		ISCED 3		ISCED 4		ISCED 5	
	Male	Female	Male	Female	Male	Female	Male	Female
EU-27	59	41	53	47	47	53	43	57
Belgium	44	56	50	50	45	55	44	56
Bulgaria	72	28	63	37	44	56	35	65
Czech Republic	44	56	53	47	57	43	31	69
Denmark	–	–	54	46	78	22	36	64
Germany	62	38	57	43	52	48	36	64
Estonia	–	–	65	35	36	64	28	72
Ireland	–	–	45	55	43	57	47	53
Greece	–	–	57	43	51	49	51	49
Spain	–	–	48	52	51	49	50	50
France	70	30	56	44	32	68	47	53
Italy	–	–	60	40	51	49	42	58
Cyprus			84	16			50	50
Latvia	82	18	60	40	35	65	50	50
Lithuania	83	17	60	40	32	68	35	65
Luxembourg	–	–	51	49	80	20	–	–
Hungary	–	–	55	45	45	55	38	62
Malta	96	4	56	44	79	21	43	57
Netherlands	61	39	54	46	59	41	46	54
Austria	–	–	56	44	44	56	35	65
Poland	–	–	59	41	37	63	19	81
Portugal	67	33	59	41	–	–	37	63
Romania	–	–	57	43	36	64	42	58
Slovenia	–	–	53	47	47	53	47	53
Slovakia	–	–	51	49	35	65	22	78
Finland	–	–	52	48	52	48	42	58
Sweden	–	–	43	57	50	50	52	48
UK	–	–	44	56	–	–	42	58

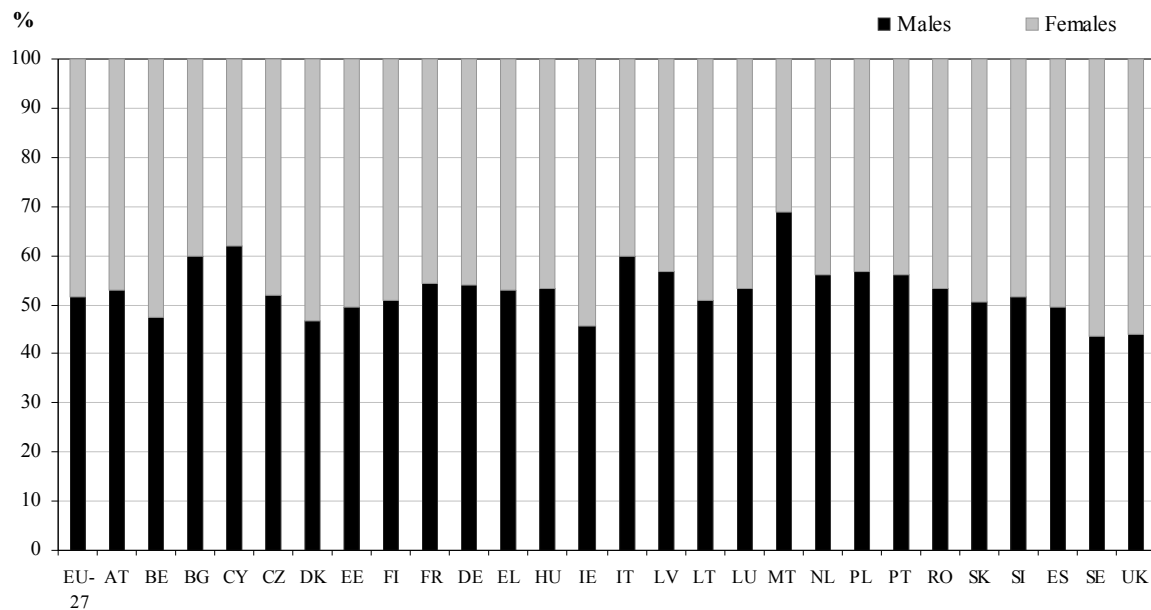
Source: NIDI calculations based on Eurostat.

Table 10: *Distribution of students in prevocational and vocational streams, by ISCED level and gender, EU-27, 2004 (%; all students at particular ISCED level=100 %)*

	ISCED 2		ISCED 3		ISCED 4		ISCED 5	
	Male	Female	Male	Female	Male	Female	Male	Female
EU-27	55	45	51	49	48	52	42	58
Belgium	43	57	51	49	49	51	43	57
Bulgaria	64	36	62	38	62	38	43	57
Czech Republic	47	53	53	47	58	42	34	66
Denmark	–	–	55	45	–	–	52	48
Germany	61	39	58	42	51	49	39	61
Estonia	–	–	67	33	38	62	37	63
Ireland	–	–	45	55	62	38	48	52
Greece	–	–	61	39	46	54	51	49
Spain	60	40	52	48	–	–	49	51
France	69	31	55	45	33	67	44	56
Italy	–	–	60	40	45	55	34	66
Cyprus	–	–	82	18	–	–	59	41
Latvia	78	22	61	39	29	71	45	55
Lithuania	77	23	61	39	42	58	38	62
Luxembourg	–	–	52	48	78	22	–	–
Hungary	57	43	62	38	49	51	38	62
Malta	–	–	73	27	56	44	40	60
Netherlands	56	44	52	48	77	23	–	–
Austria	–	–	57	43	39	61	34	66
Poland	–	–	61	39	43	57	19	81
Portugal	69	31	55	45	68	32	46	54
Romania	–	–	56	44	38	62	43	57
Slovenia	–	–	56	44	36	64	47	53
Slovakia	70	30	53	47	45	55	22	78
Finland	–	–	50	50	52	48	55	45
Sweden	–	–	42	58	48	52	52	48
UK	–	–	42	58	–	–	33	67

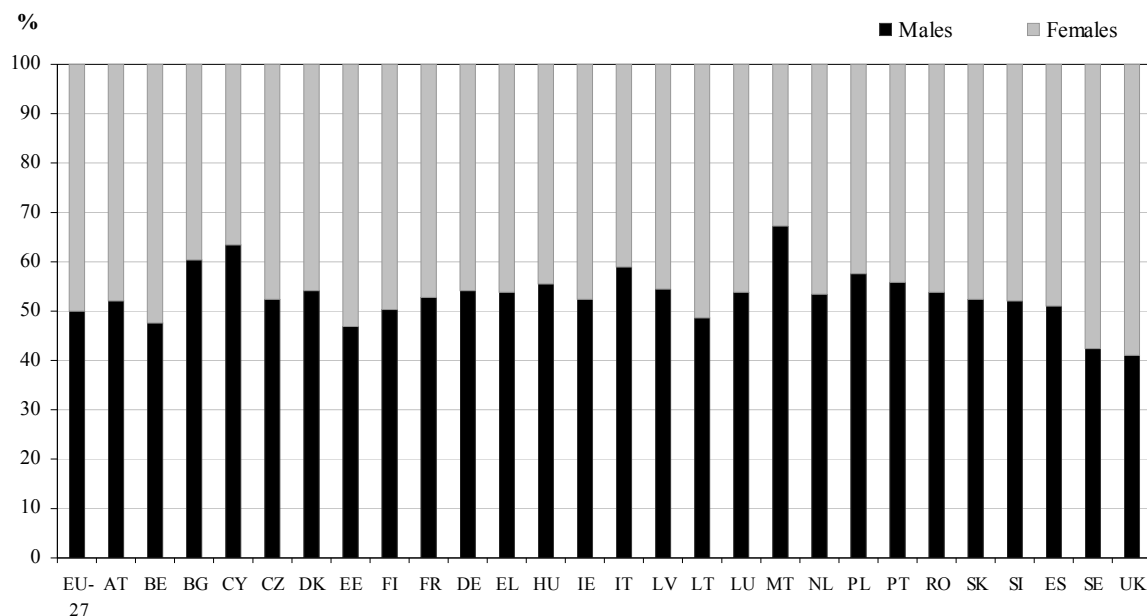
Source: NIDI calculations based on Eurostat.

Figure 9: Distribution of students at ISCED 2-5 in prevocational and vocational streams by gender, EU-27, 2000 (%)



Source: NIDI calculations based on Eurostat.

Figure 10: Distribution of students at ISCED 2-5 in prevocational and vocational streams by gender, EU-27, 2004 (%)



Source: NIDI calculations based on Eurostat.

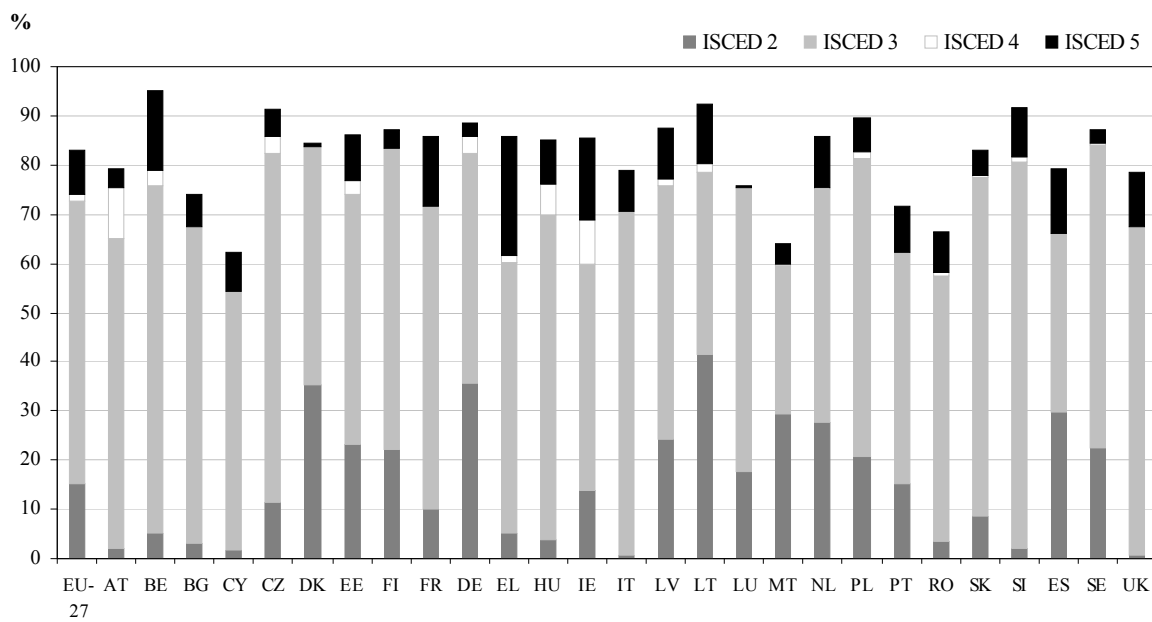
3.3. Education participation

In 2004, of all persons in the 15-19 age group in the EU, around 83 % participated in initial education at ISCED 2-5. Participation was highest in Belgium, the Czech Republic, Lithuania and Slovenia (all above 90 %) and lowest in Cyprus, Malta and Romania (all below 70 %). In the 20-24 age group around 37 % participated in initial education at these levels. The highest levels can be observed in Denmark, Poland, Slovenia and Finland (all above 45 %); the lowest in Bulgaria, Cyprus, Luxembourg, Malta and Slovakia (all below 25 %) (Figures 11 and 12).

As could be observed from Figure 7, the distribution of students in general, prevocational and vocational streams shows large differences between Member States. Therefore, participation of students in the 15-19 and 20-24 age groups in prevocational and vocational streams show similar differences. In 2004, of all persons in the 15-19 age group in the EU, around 37 % participated in prevocational and vocational streams at ISCED 2-5. Participation was highest in Belgium, the Czech Republic and Austria (all above 60 %) and lowest in Spain, Cyprus, Lithuania, Malta and Portugal (all below 20 %). In the 20-24 age group around 10 % participated in prevocational and vocational streams at these levels. The highest levels in 2004 can be observed in Belgium and Slovenia (both above 20 %); the lowest in Bulgaria, Italy, Portugal and Slovakia (all below 5 %) (Figures 13 and 14).

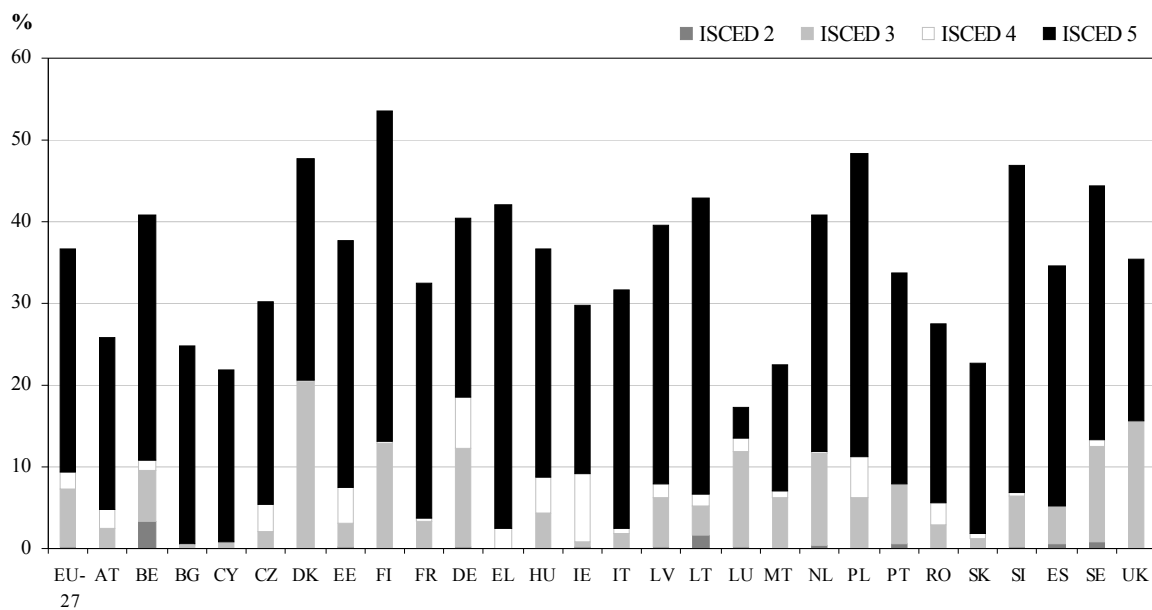
To give some idea of education participation at single ages, Figure 15 shows an illustrative selection of current education participation rates in the EU by ISCED level and stream, for some selected single ages, ISCED level over the period 1998-2004 (the most recent data available). Looking at single ages, current participation rates in initial (vocational) education and training in the EU are the highest at ages 16-19 for ISCED 3, at ages 19-22 for ISCED 4, and at ages 18-21 for ISCED 5B. Particularly for VET the relative short time series do not show clear patterns. At ISCED 3 single age participation rates of students in general education show a slightly upward trend since the second half of the observation period, whereas participation rates in prevocational and vocational streams show a more or less stable pattern in the same period. Overall, at ISCED 4 single age participation rates declined since 1998, but slightly recovered from around the year 2002. At ISCED 5B single age participation rates increased since 1998, but declined in the last year of observation.

Figure 11: Education participation in the 15-19 age group by ISCED level, EU-27, 2004 (%)



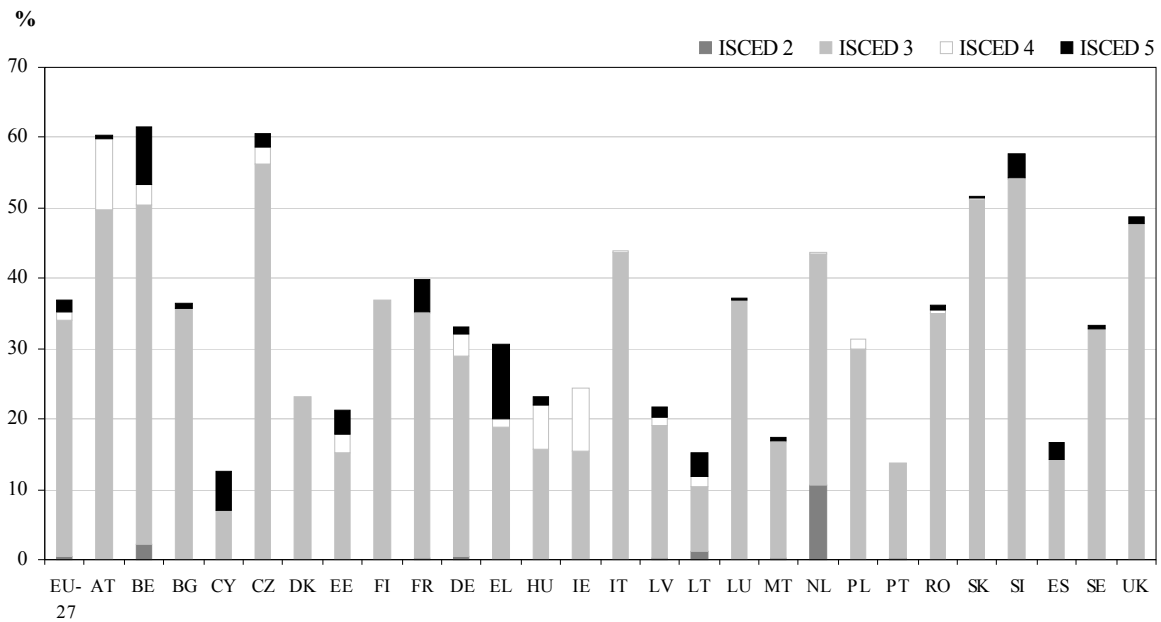
Source: NIDI calculations based on Eurostat.

Figure 12: Education participation in the 20-24 age group by ISCED level, EU-27, 2004 (%)



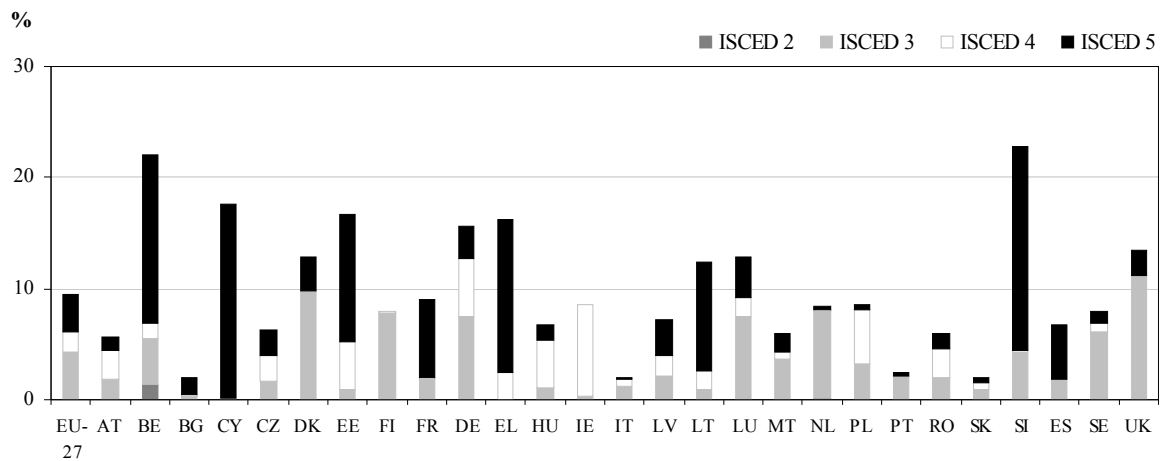
Source: NIDI calculations based on Eurostat.

Figure 13: Participation in prevocational and vocational streams, in the 15-19 age group, by ISCED level, EU-27, 2004 (%)



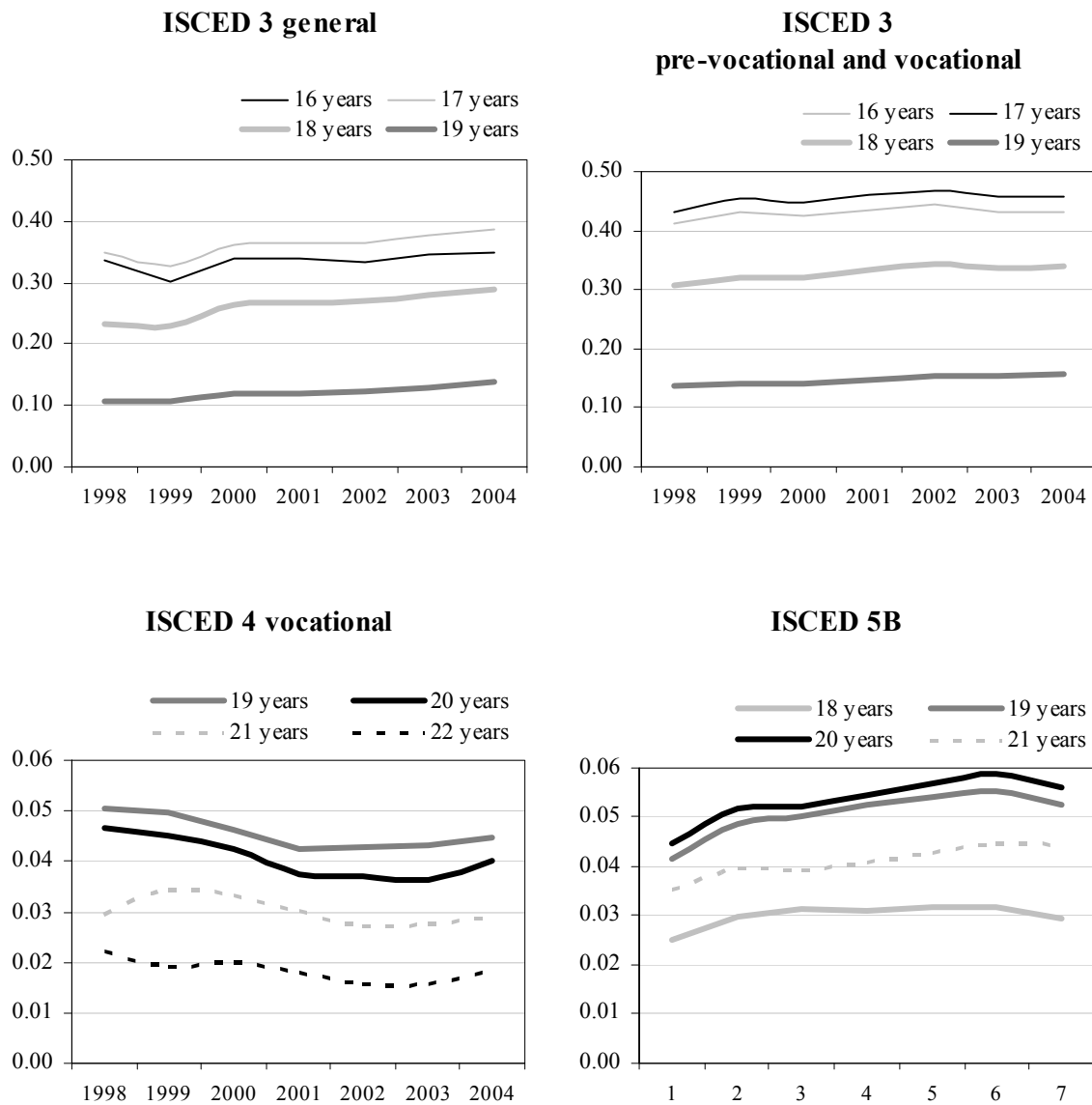
Source: NIDI calculations based on Eurostat.

Figure 14: Participation in prevocational and vocational streams, in the 20-24 age group by ISCED level, EU-27, 2004 (%)



Source: NIDI calculations based on Eurostat.

Figure 15: Education participation rates by selected age, ISCED level and educational stream ⁽⁸⁾, EU-27 ⁽⁹⁾, 1998-2004



Source: NIDI calculations based on Eurostat.

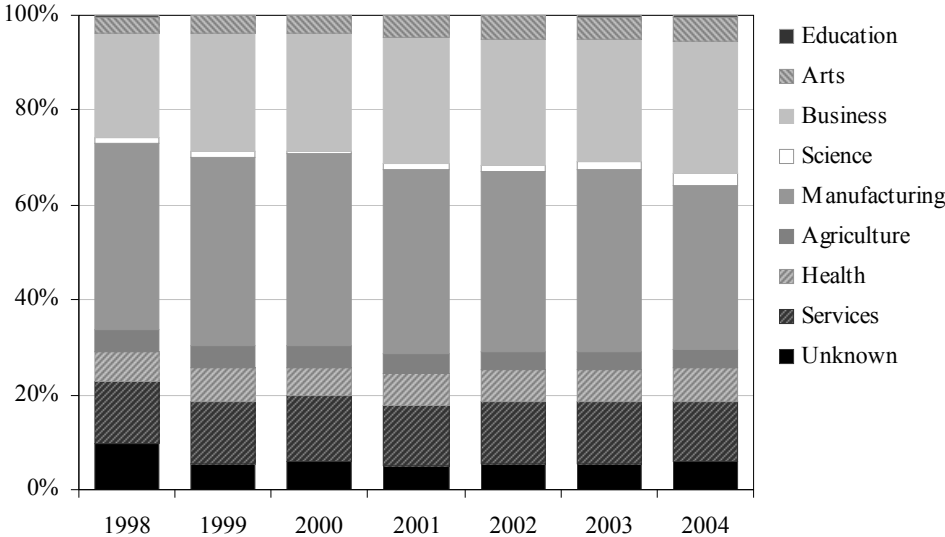
⁽⁸⁾ ISCED level 4 is in fact almost entirely VET and level 5B VET only.

⁽⁹⁾ 1998 EU-27 except Belgium, Cyprus, Malta and Slovakia, 1999 except Slovakia, 2004 except Malta.

3.4. Fields of education

The distribution of graduates by fields of education ⁽¹⁰⁾ in IVET showed only slight changes in the recent past. Figure 16 presents the distribution of graduates at ISCED 3. Most graduates can be found in ‘social sciences, business and law’ and ‘engineering, manufacturing and construction’. These two fields are dominated by business and manufacturing programmes respectively. Since 2001, the share of graduates in ‘science, mathematics and computing’ (increasingly dominated by computing programmes) is growing, whereas the share of ‘engineering, manufacturing and construction’ is declining. Though this applies to both male and female graduates, distribution is rather different between the genders (Figures 17 and 18). Male students are dominantly graduating in ‘engineering, manufacturing and construction’. Female students are more likely to graduate in ‘social sciences, business and law’ programmes.

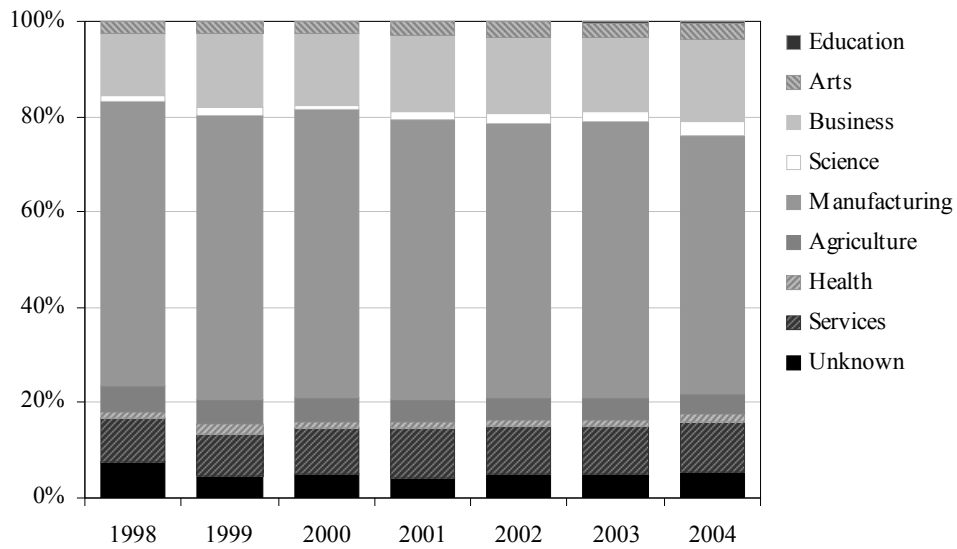
Figure 16: Distribution of VET graduates at ISCED 3, by field of education, EU-27, 1998-2004



Source: NIDI calculations based on Eurostat.

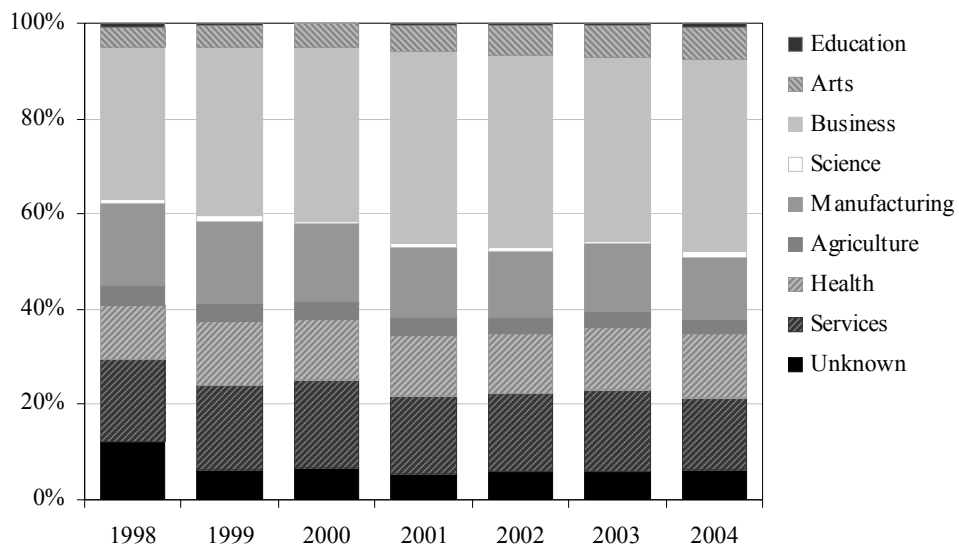
⁽¹⁰⁾ For explanation see Annex A.

Figure 17: Distribution of male VET graduates at ISCED 3 by field of education, EU-27, 1998-2004



Source: NIDI calculations based on Eurostat.

Figure 18: Distribution of female VET graduates at ISCED 3, by field of education, EU-27 ⁽¹⁾, 1998-2004



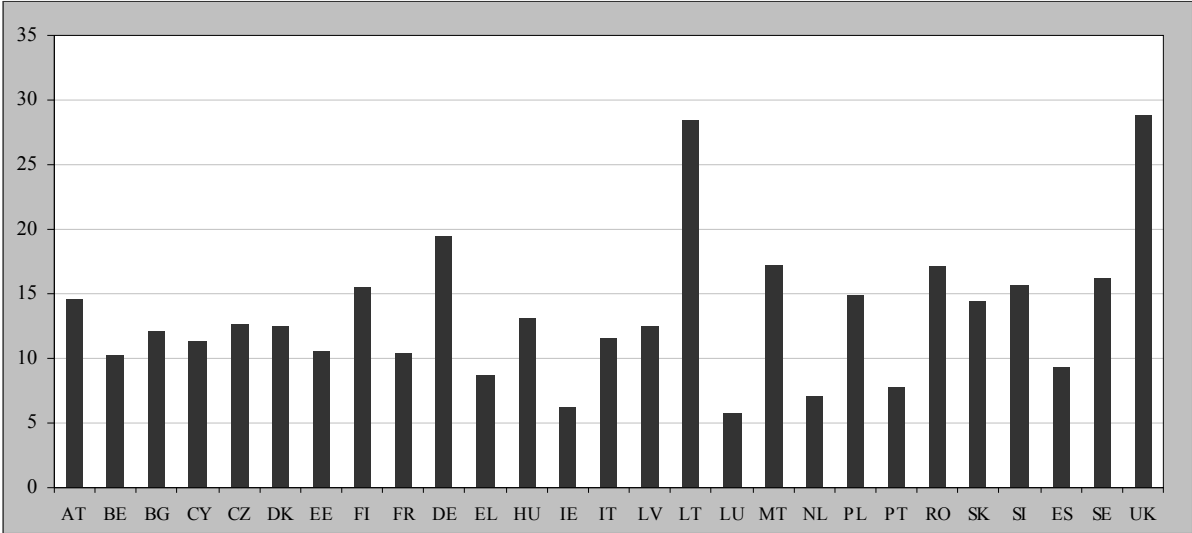
Source: NIDI calculations based on Eurostat.

⁽¹⁾ EU-27 except Ireland, Greece, France, Malta, Austria, Portugal and the UK (no or incomplete time series).

3.5. Teaching staff

Unfortunately, no consistent data are available from the Eurostat database or the Unesco/OECD/Eurostat database on the number of teaching staff by educational stream, that is general, prevocational and vocational streams. Therefore, it is not possible to calculate student/teacher ratios by ISCED level for prevocational and vocational streams separately. Table 11 presents student/teacher ratios by ISCED level for all streams together (average number of students per teacher) which is as far as breakdowns allow. Assuming no large differences exist between general and vocational streams for student/teacher ratios, one might consider these data applicable to prevocational and vocational streams as well. The table shows substantial differences between countries, which are difficult to interpret, probably due to incomparable differences in educational systems between countries.

Figure 19: Average number of students per teacher, at ISCED 3, EU-27, 2004 ⁽¹²⁾



Source: NIDI calculations based on Eurostat.

⁽¹²⁾ Estonian and Lithuanian data from 2001; Danish and Polish data from 2003.

Table 11: Average number of students per teacher, by ISCED level, EU-27, 2004

	ISCED 2	ISCED 3	ISCED 4	ISCED 5/6
Belgium	12.6	10.2	:	21.5
Bulgaria	12.9	12.1	35.1	15.0
Czech Republic	13.6	12.7	35.3	20.0
Denmark	4.2	12.6 xx	8.1 **	66.5 *
Germany	15.6	19.5	28.8	13.0
Estonia	11.2 x	10.6 x	10.4 x	14.6
Ireland	7.0 xx	6.1	:	15.2
Greece	8.2	8.6	7.0	29.0
Spain	13.6	9.4	–	15.2
France	14.1	10.4	4.5 ***	16.9
Italy	10.4	11.6	:	21.6
Cyprus	12.1	11.3	–	16.6
Latvia	12.9	12.6	13.2	29.5
Lithuania	7.0	28.5 x	12.2	17.9
Luxembourg	5.3 xx	5.8	–	–
Hungary	10.2	13.2	15.7	20.3
Malta	10.2	17.2	:	17.3
Netherlands	15.5 *	7.2	:	15.3
Austria	10.4	14.6	12.8	15.6
Poland	12.6 xx	14.9 xx	26.5 xx	22.0 xx
Portugal	10.6	7.7	:	13.8
Romania	13.4	17.1	52.8	22.8
Slovenia	12.0	15.6	29.5	32.2
Slovakia	13.9	14.5	14.5	14.9
Finland	10.0	15.5	:	16.8
Sweden	12.1	16.2	21.9	12.9
UK	17.2	28.8	–	23.9

Student/teacher ratio = number of students/number of teachers (or academic staff at ISCED 5-6)

* 1998, ** 1999, *** 2000, xx 2001, xx 2003, : unknown

Source: NIDI calculations based on Eurostat.

4. Projection methodology

IVET projections carried out in this report will be in line with Eurostat population projections (Eurostat, 2006; Lanzieri, 2006). To project future numbers of students and graduates in IVET the outcomes of Eurostat population projections have to be combined with future education level specific participation and graduation rates of students in IVET. A well established way to do so is using the participation ratio method (George et al., 2004; Siegel, 2002). The results of such an exercise can be extended relatively easily, again using the participation ratio method, with graduation rates and teacher/student ratios.

4.1. Participation ratio method

The idea of the participation ratio method is to develop assumptions on future participation rates (such as education participation and graduation rates) in population categories defined by a certain combination of age, gender and potential other characteristics. An independent projection of the population by age and gender (such as Eurostat population projections) simplifies projection of the future number of participants, broken down by demographic characteristics.

The participation ratio method for projecting future numbers of students and graduates in IVET has several attractive characteristics: it is a relatively simple and practical method, necessary data are usually available and projections can be updated easily.

4.1.1. Student participation ratios

The participation ratio method is also known as the participation rate method, the prevalence ratio method and the incidence rate method. In this approach socioeconomic characteristics are related to demographic characteristics by using ratios (Siegel, 2002). Current and historical data are used to construct participation ratios, that is proportions of the population (stratified by age, gender and possibly other demographic characteristics) for the geographic area(s) under consideration to obtain a set of socioeconomic projections (George et al., 2004).

The steps used in this approach can be summarised as follows:

- (a) starting year participation ratio $p_{dt}^c = P_{dt}^c / P_{dt}$
- (b) projected participation ratio p_{dt+i}^c
- (c) independently projected population P_{dt+i}
- (d) projected population with the characteristic $P_{dt+i}^c = p_{dt+i}^c * P_{dt+i}$

where

P = population

p = participation rate

c = characteristic (e.g. educational level and/or educational field)

d = demographic data (e.g. age-gender)

t = starting data

$t+i$ = target date.

The way to project education participation is to multiply age (and gender) specific participation rates (proportions of the population at school at each age) by the age (and gender) specific projected population (the Eurostat projections). The assumptions relating to future age-specific participation rates p_{dt+i}^c may be quite straightforward. Past trends in the rates may be assumed to remain stable, continue as observed or to continue in a modified fashion. One may assume, for example, that current age-specific participation rates p_{dt}^c will remain unchanged in the future. One could also use more complex extrapolation methods to project age-specific participation rates, such as (non-) linear estimation techniques. However, in the latter case long historical time series of educational and other explanatory variables are needed as well as clear observed trends in the data.

4.1.2. Graduation ratios

To extend the model to graduation rates, the result of the previous exercise has to be multiplied similarly by graduation rates. Graduation rates are calculated as the number of graduates by age, gender, ISCED level and programme divided by the number of students by age, gender, ISCED level and programme.

The steps used in this follow-up approach can be summarised as follows:

(a) starting year graduation ratio $g_{dt}^c = G_{dt} / P_{dt}^c$

(b) projected graduation ratio g_{dt+i}^c

(c) projected number of graduates with the characteristic

$$G_{dt+i}^c = g_{dt+i}^c * p_{dt+i}^c * P_{dt+i} = g_{dt+i}^c * P_{dt+i}^c$$

where

G = number of graduates

g = graduation rate

Again, past trends in the rates by age, gender and ISCED level may be assumed to remain stable, to continue as observed or to continue in a modified fashion.

4.1.3. Staff-student ratios

To extend the model to staff/student ratios, similarly the result of the previous exercise has to be multiplied by the student/teacher ratio.

The steps used in this follow-up approach can be summarised as follows:

- (a) starting year staff/student ratio $s_{dt}^c = S_{dt}^c / P_{dt}^c$
- (b) projected staff/student ratio s_{dt+i}^c
- (c) projected number of staff $S_{dt+i}^c = s_{dt+i}^c * P_{dt+i}^c * P_{dt+i} = s_{dt+i}^c * P_{dt+i}^c$

where

S = number of teachers (staff)

s = staff/student ratio

Similarly, past trends in the ratios may be assumed to remain stable, to continue as observed or to continue in a modified fashion.

4.2. Data

This analysis uses the most recent data available at the time of the research. The data on VET are primarily based on harmonised data from the Eurostat database (*Population and social conditions – education and training section*), since this data source proved to be the most complete covering all EU-27 Member States (¹³). Data needed for the projections by country are historical time series of:

- (a) both number of students in VET and total number of students by gender, age, educational level and Member State;
- (b) both number of students in VET and total number of students by gender, age, educational level, educational field and Member State;
- (c) population by gender, age and Member State.

The Eurostat database (*Population and social conditions – education and training section*) contains the following harmonised data on (vocational) education and training for the period 1998-2004:

- (a) number of students by gender, age, educational level (ISCED; see Annex A) and Member State;

(¹³) At the time of the research the Unesco/OECD/Eurostat database on education statistics, for instance, did not include eight of the 27 Member States (Bulgaria, Estonia, Cyprus, Latvia, Lithuania, Malta, Romania and Slovenia).

- (b) number of students in VET and total number of students by educational level (ISCED), educational stream (general, prevocational and vocational), educational field and Member State (Annex A);
- (c) population by gender, age and Member State.

Eurostat population projections are also directly available from the Eurostat database (*Population and social conditions – population section*) for all EU-27 Member States: future population by gender, age (single year age groups), Member State and population variant for the period 2005-50 (base year 2004).

The data mentioned are available for all EU-27 Member States only. Though some Eurostat (educational) datasets contain data for European candidate countries and other non-EU countries, the necessary full dataset was available for none of these countries, neither were any of these countries included in any of the variants of Eurostat population projections. All educational projections are, therefore, restricted to EU-27 Member States. The historical time series on education participation are limited to the period 1998-2004. For some EU-15 Member States older time series do exist, however these time series are neither publicly available nor harmonised with 1998-2004 data, because of the fundamental ISCED revision in 1997.

4.3. Assumptions and scenarios

From the purely demographic projection point of view, projection assumptions will be fully consistent with Eurostat population projections. Future population numbers in the age groups of interest are exactly the same as in the Eurostat population projections. For future participation and graduation of students in IVET the projections start from a straightforward baseline variant, keeping participation and graduation rates by age, sex and education level at their current levels. The reasoning behind this is both conceptual and pragmatic. This baseline assumption with constant participation and graduation rates will gain a clear insight into implications of pure demographic trends for future numbers of students and graduates in IVET without being disturbed by deviating assumptions on participation and graduation. Consistent historical time series available on education data are relatively short, only covering the period 1998-2004 and often miss several years in this period. The time series does not show clear trends, either upwards or downwards and, therefore, does not allow extrapolating historical trends other than keeping rates constant.

Observed education participation rates (averaged over the period 1998-2004) by (single) age, gender, ISCED level and programme orientation (prevocational and vocational) were kept constant over the whole projection period from 2005 up to 2050. For instance, the education participation rate of boys aged 16 at ISCED 3 is the same in 2050 as it is in 2005. Similarly, graduation rates were kept constant. However, as could be observed in the previous chapter, there are some slight shifts in the distribution of graduates by fields of education: the most important shift being from ‘engineering, manufacturing and construction’ (especially

engineering and manufacturing) to ‘science, mathematics and computing’ (especially computing). This trend in the period 1998-2004 has been incorporated for several countries as a linear trend up to the year 2025 in the scenarios (Tables B5 to B7 in Annex B); after 2025 the distribution remains constant⁽¹⁴⁾. Distribution in the remaining fields of education is assumed to remain constant throughout the whole projection period. In some countries there were no data available on distribution of graduates by field of education at ISCED 3. In these countries⁽¹⁵⁾ all graduates were classified as ‘unknown’.

In a second stage other assumptions are included in three alternative scenarios. The first two are meant to improve insight into the implications of demographic trends. In these scenarios the ‘high population’ and ‘low population’ variants of the Eurostat population projections are combined with the constant IVET future participation and graduation rates. Demographic assumptions are different from the baseline scenario and assumptions on participation and graduation are the same as in the baseline. The third alternative scenario is in line with the Eurostat ‘baseline’ variant again, but assumptions on IVET future participation are different. The latter are of a more normative nature: in this scenario it is assumed that the total number of students in IVET will remain unchanged in future. This scenario will give an indication to what extent IVET participation needs to be increased to prevent contraction of the IVET system. By keeping graduation rates constant in this scenario, the number of graduates will then, due to increased participation rates, remain at the same level as well. The majority of students in VET participate in upper secondary level (ISCED 3). Most are in the 15-19 age group where total participation rates (of all ISCED levels aggregated) are very high. Increasing participation in VET, then, is hardly possible by increasing participation rates, since there is not much to gain. Another way of increasing participation in VET is to shift participation from general to vocational streams. This alternative scenario explores to what extent education participation needs to be shifted in favour of VET and thus assessing the sense of reality of such a scenario.

Summarising, the following scenarios will be explored:

- (a) baseline scenario: ‘baseline’ variant combined with constant IVET participation and graduation rates;
- (b) high population scenario: ‘high population’ variant combined with constant IVET participation and graduation rates;
- (c) low population scenario: ‘low population’ variant combined with constant IVET participation and graduation rates;

⁽¹⁴⁾ The target year 2025 is an arbitrary choice based on both the time horizon and pragmatic considerations. From the perspective of making projections a projection interval of 20 years is a very long one; usually historical based trends are assumed to converge after a certain point in time and then to remain stable. More pragmatic is the fact that continuation of the observed trends after 2025 results in unrealistic values (below zero) in some cases.

⁽¹⁵⁾ Ireland, France, Malta, Portugal and the UK. In the case of Malta and the UK the numbers of graduates were not available either; therefore, EU-average graduation rates were used instead.

- (d) constant number of VET participants scenario: ‘baseline’ variant combined with increased IVET participation rates, and constant IVET graduation rates; this scenario will be referred to as the ‘increased participation (rates)’ variant ⁽¹⁶⁾.

The first scenario is applied to EU-27 as a whole and to all Member States separately. The three alternative scenarios are applied to EU-27 as a whole only. In the following chapter the main results of the projections are presented.

⁽¹⁶⁾ To assess the sensitivity of this scenario, two extra variants of this scenario are calculated: increased IVET participation rates combined with the ‘high population’ and the ‘low population’ variant respectively (instead of the ‘baseline population’ variant).

5. Projection results

This chapter presents the results of the projections of future numbers of students and graduates in IVET according to the assumptions outlined in the previous chapter. First, the respective projection results according to the ‘baseline scenario’ are presented. Next, implications of these results for teaching staff and future labour-market consequences are explored. Finally, the outcomes of the alternative scenarios for the future number of students in IVET are illustrated. Results of the alternative scenarios for future number of graduates are presented in Annex C ⁽¹⁷⁾.

All projection results refer to EU-27. The starting (base) year of projections is 2005.

Detailed outcomes of the projections in tables and figures for EU-27 as a whole are available in Annex C. The detailed country-specific projections are available at: http://www.trainingvillage.gr/etv/Information_resources/Bookshop/publication_details.asp?pub_id=506.

5.1. The baseline scenario

5.1.1. The number of students in IVET

According to the Eurostat ‘baseline’ variant the population aged 15-24 decreases by around 17 % from 62 million in 2005 to 51 million in 2030 (Chapter 2). In the long term the population aged 15-24 might even further decline to 46 million in 2050, more than a quarter lower than in 2005. Keeping education participation rates unchanged in future will cause the number of students to decrease in line with the decline of the population aged 15-24 (Tables 12 and 13).

The total number of students in prevocational and vocational streams from lower secondary education up to the first stage of tertiary education at ISCED 2-5 is expected to decrease from 14.2 million students in 2005 to 11.9 million in 2030 according to the ‘baseline’ variant. Particularly at ISCED 3 the decrease in the number of students in prevocational and vocational streams is large in absolute numbers: ISCED from 11.5 million in 2005 to 9.6 million in 2030; a decline of almost 2 million students. As can be observed from Figures 20 and 21, particularly in the period 2009-15 the decline is relatively steep.

Up to 2020 the number of students in prevocational and vocational streams at ISCED 2 remains rather stable. This category is dominated by the Netherlands: two thirds of the pupils in this category are from the Netherlands, one of the few Member States where the population in the 15-24 age group is not expected to decline in the future. On the other hand, the number

⁽¹⁷⁾ Assuming constant graduation rates, the impact of alternative scenarios on the future number of graduates will be similar to the effects of the respective scenarios on future number of students.

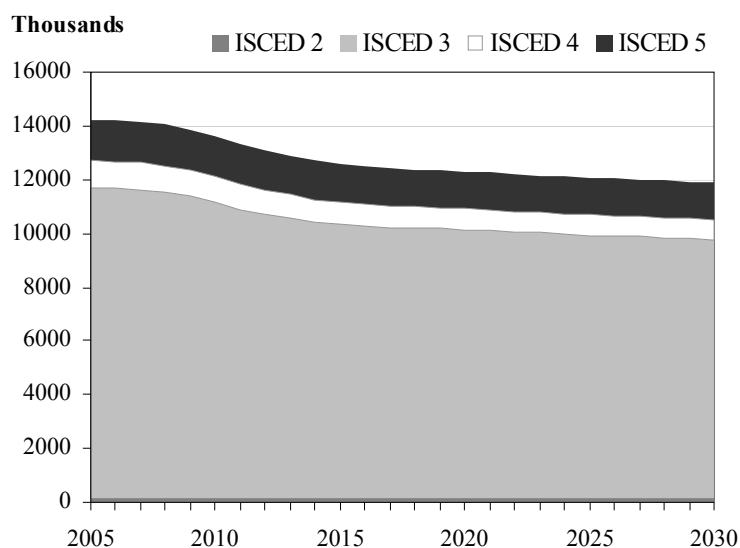
of students in prevocational and vocational streams at ISCED 4 is expected to decline above average. This category is dominated by Germany, Poland and Romania. These countries all show above average future decline of the population in the 15-24 age group.

Table 12: Projected population and number of students in prevocational and vocational streams by ISCED level and age group, EU-27, 2005-50, baseline variant/constant education participation (000s)

	Age group	2005	2010	2015	2020	2025	2030	2050
Population	15-19	30 333	28 498	26 298	25 955	25 695	25 232	22 368
	20-24	31 935	30 866	28 931	26 739	26 429	26 214	23 393
	total	62 268	59 364	55 229	52 694	52 124	51 446	45 761
ISCED 2-5	15-19	11 229	10 628	9 807	9 668	9 508	9 356	8 403
	20-24	3 018	2 995	2 769	2 628	2 555	2 534	2 318
	total	14 247	13 623	12 576	12 295	12 063	11 890	10 721
ISCED 2	15-19	161	160	161	159	151	149	148
	20-24	11	11	12	11	11	11	11
	total	173	171	173	171	162	159	159
ISCED 3	15-19	10 182	9 593	8 863	8 728	8 593	8 450	7 576
	20-24	1 343	1 370	1 291	1 227	1 177	1 164	1 088
	total	11 526	10 963	10 154	9 955	9 771	9 614	8 664
ISCED 4	15-19	370	369	316	307	296	296	262
	20-24	623	606	524	486	459	458	407
	total	992	975	841	793	755	753	669
ISCED 5	15-19	516	505	466	473	468	462	417
	20-24	1 041	1 008	943	903	908	902	812
	total	1 556	1 514	1 409	1 376	1 375	1 364	1 229

Source: NIDI calculations based on Eurostat.

Figure 20: Projected number of students aged 15-24 in prevocational and vocational streams, by ISCED level, EU-27, 2005-30, baseline variant/constant education participation (000s)



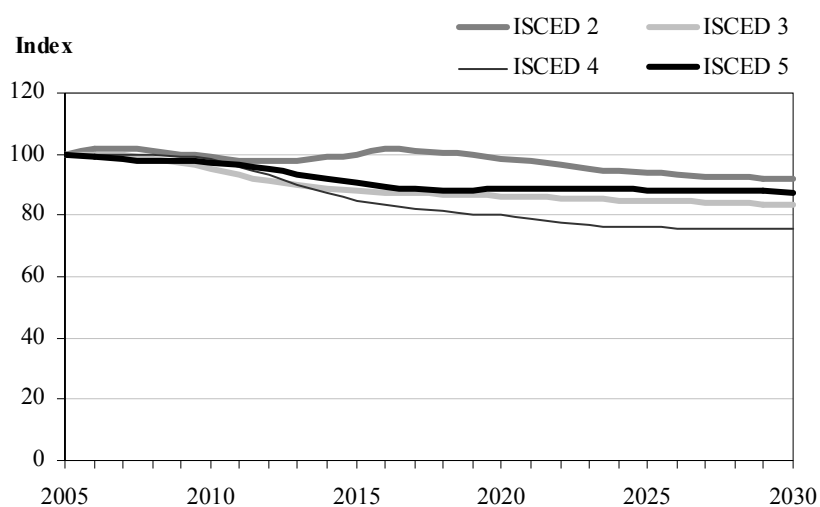
Source: NIDI calculations based on Eurostat.

Table 13: Index of the projected population and number of students in prevocational and vocational streams, by ISCED level and age group, EU-27, 2005-50, baseline variant/constant education participation (2005=100)

	Age group	2005	2010	2015	2020	2025	2030	2050
Population	15-19	100	94	87	86	85	83	74
	20-24	100	97	91	84	83	82	73
	total	100	95	89	85	84	83	73
ISCED 2-5	15-19	100	95	87	86	85	83	75
	20-24	100	99	92	87	85	84	77
	total	100	96	88	86	85	83	75
ISCED 2	15-19	100	99	100	99	94	92	92
	20-24	100	100	103	99	98	94	93
	total	100	99	100	99	94	92	92
ISCED 3	15-19	100	94	87	86	84	83	74
	20-24	100	102	96	91	88	87	81
	total	100	95	88	86	85	83	75
ISCED 4	15-19	100	100	86	83	80	80	71
	20-24	100	97	84	78	74	74	65
	total	100	98	85	80	76	76	67
ISCED 5	15-19	100	98	90	92	91	90	81
	20-24	100	97	91	87	87	87	78
	total	100	97	91	88	88	88	79

Source: NIDI calculations based on Eurostat.

Figure 21: Index of the projected number of students aged 15-24 in prevocational and vocational streams, by ISCED level, EU-27, 2005-30, baseline variant/constant education participation (2005=100)



Source: NIDI calculations based on Eurostat.

Differences in the numbers of students in prevocational and vocational streams between countries are similar to the differences of the population in the 15-24 age group as presented in Chapter 2. Tables 14 and 15 show the projected numbers of students in prevocational and vocational streams at all ISCED levels and at ISCED 3 separately. Germany and newer Member States are expected to have a relatively substantial decline of the number of students in prevocational and vocational streams. These countries together account for a decrease of 1.7 million students at ISCED 2-5 in 2030; around 73 % of the total decline in EU-27 in 2030. In absolute numbers Germany and Poland are expected to have the largest decrease: 478 000 and 500 000 respectively.

Table 14: Projected number of students aged 15-24 in prevocational and vocational streams, ISCED 2-5, EU-27, 2005-50, baseline variant/constant education participation (000s)

	2005	2010	2015	2020	2025	2030	2050
EU-27	14 247	13 623	12 576	12 295	12 063	11 890	10 721
Belgium	522	535	516	504	491	489	475
Bulgaria	199	157	122	120	115	108	81
Czech Republic	441	411	310	307	312	318	259
Denmark	108	123	130	126	120	111	117
Germany	2 344	2 287	2 086	2 000	1 882	1 866	1 657
Estonia	40	35	25	23	25	26	20
Ireland	100	91	91	99	106	107	94
Greece	312	278	264	259	269	270	222
Spain	585	534	506	533	568	552	414
France	1 907	1 846	1 831	1 921	1 880	1 836	1 787
Italy	1 331	1 319	1 274	1 309	1 284	1 186	1 002
Cyprus	18	17	16	14	13	14	14
Latvia	53	45	29	27	30	33	25
Lithuania	74	70	55	45	42	43	38
Luxembourg	13	15	15	15	15	16	18
Hungary	194	185	160	146	147	146	132
Malta	7	7	6	5	6	6	6
Netherlands	510	535	538	552	521	501	522
Austria	320	330	302	283	275	273	247
Poland	1 220	1 042	846	723	694	720	612
Portugal	100	93	90	93	95	91	76
Romania	725	550	472	446	445	430	321
Slovenia	105	90	79	75	75	79	68
Slovakia	224	198	157	138	137	137	114
Finland	144	149	139	132	131	133	124
Sweden	233	261	218	214	228	233	232
UK	2 420	2 420	2 297	2 184	2 155	2 165	2 042

Source: NIDI calculations based on Eurostat.

Table 15: Projected number of students aged 15-24 in prevocational and vocational streams, ISCED 3, EU-27, 2005-50, baseline variant/constant education participation (000s)

	2005	2010	2015	2020	2025	2030	2050
EU-27	11 526	10 963	10 154	9 955	9 771	9 614	8 664
Belgium	325	330	317	310	302	303	292
Bulgaria	186	145	113	113	108	101	75
Czech Republic	381	354	263	268	271	275	224
Denmark	99	113	119	115	109	101	106
Germany	1 734	1 656	1 535	1 456	1 379	1 372	1 212
Estonia	17	13	10	10	11	11	9
Ireland	46	43	45	50	52	51	46
Greece	114	108	102	105	109	107	88
Spain	378	355	338	364	385	366	279
France	1 429	1 369	1 375	1 445	1 400	1 371	1 339
Italy	1 304	1 294	1 249	1 285	1 258	1 161	983
Cyprus	4	4	3	3	3	4	3
Latvia	39	31	20	20	23	25	18
Lithuania	27	25	19	15	15	16	13
Luxembourg	12	13	14	14	13	14	16
Hungary	107	102	85	82	83	81	74
Malta	6	6	5	5	5	5	5
Netherlands	397	418	418	432	409	392	408
Austria	249	256	232	219	213	212	191
Poland	998	853	689	594	577	602	505
Portugal	95	88	85	89	90	87	72
Romania	637	458	408	385	388	372	278
Slovenia	74	62	56	54	54	58	49
Slovakia	218	192	152	134	133	133	111
Finland	143	149	139	131	131	133	124
Sweden	221	247	204	202	216	220	219
UK	2 286	2 280	2 160	2 057	2 031	2 042	1 923

Source: NIDI calculations based on Eurostat.

5.1.2. The number of graduates in IVET

In line with the decline of the projected number of students in IVET, the number of graduates is expected to decline as well. Under the fairly moderate assumption of unchanged graduation rates the general pattern is similar. The number of annual VET graduates at ISCED 3-5 is expected to decrease from 3.7 million in 2005 to 3.1 million in 2030 (Tables 16; 17 and Figure 22). The majority of graduates are at ISCED 3, showing a similar decline of 2.9 million in 2005 to 2.4 million in 2030. The distribution of graduates by field of education at this educational level will only change slightly (Figure 23). The most important one is a shift from graduates in ‘engineering, manufacturing and construction’ (mainly manufacturing) to

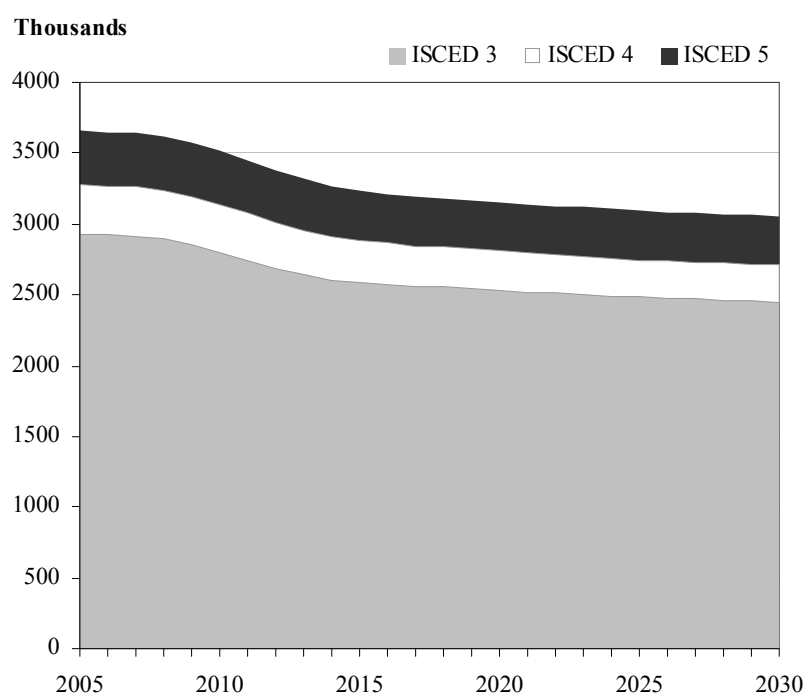
‘science, mathematics and computing’ (mainly computing), however still hardly visible from the graph.

Table 16: Projected number of VET graduates, by ISCED level and age group, EU-27, 2005-50, Eurostat baseline variant/constant education participation/constant graduation rates (000s)

	Age group	2005	2010	2015	2020	2025	2030	2050
ISCED 3-5	15-19	2 726	2 598	2 394	2 364	2 326	2 292	2 069
	20-24	936	920	840	794	770	762	693
	total	3 661	3 518	3 234	3 157	3 096	3 054	2 762
ISCED 3	15-19	2 486	2 359	2 179	2 148	2 114	2 083	1 880
	20-24	444	441	407	386	370	364	336
	total	2 929	2 800	2 586	2 535	2 484	2 447	2 216
ISCED 4	15-19	123	125	108	105	102	102	91
	20-24	225	218	188	172	161	161	143
	total	349	344	297	277	263	262	234
ISCED 5	15-19	117	114	107	110	109	108	98
	20-24	267	260	244	236	239	237	214
	total	383	374	351	346	348	345	312

Source: NIDI calculations based on Eurostat.

Figure 22: Projected number of VET graduates aged 15-24, by ISCED level, EU-27, 2005-30, baseline variant/constant education participation/constant graduation rates (000s)



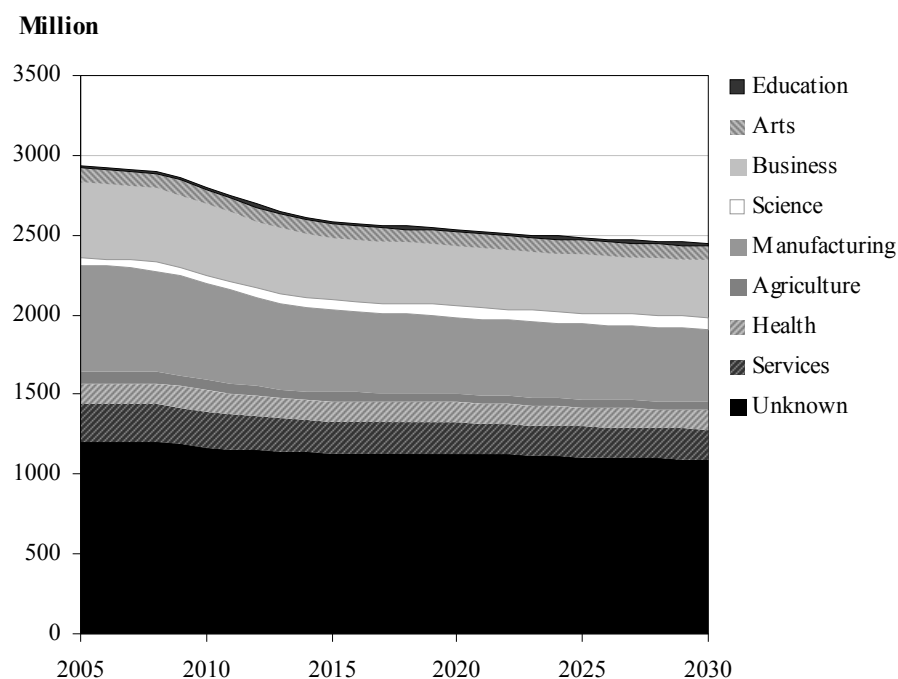
Source: NIDI calculations based on Eurostat.

Table 17: Projected number of VET graduates aged 15-24, ISCED 3-5, EU-27, 2005-50, baseline variant/constant education participation/constant graduation rates (000s)

	2005	2010	2015	2020	2025	2030	2050
EU-27	3 661	3 518	3 234	3 157	3 096	3 054	2 762
Belgium	100	105	100	98	95	94	92
Bulgaria	37	31	23	22	21	20	15
Czech Republic	113	105	80	78	80	81	66
Denmark	23	25	28	28	26	25	25
Germany	639	630	571	549	515	511	454
Estonia	9	8	5	5	5	6	4
Ireland	32	29	30	33	35	34	31
Greece	48	44	41	41	42	42	35
Spain	177	162	153	161	171	167	125
France	687	664	659	692	677	661	643
Italy	246	248	234	237	240	225	185
Cyprus	4	4	4	3	3	3	3
Latvia	12	10	7	6	7	8	6
Lithuania	18	18	14	11	10	11	9
Luxembourg	2	3	3	3	3	3	4
Hungary	64	62	54	48	48	48	43
Malta	2	2	2	1	2	2	2
Netherlands	114	120	120	124	118	113	117
Austria	91	94	86	80	78	78	70
Poland	344	292	239	200	185	190	167
Portugal	15	14	14	14	14	14	12
Romania	202	162	132	124	124	121	90
Slovenia	18	15	14	13	13	14	12
Slovakia	59	53	42	36	35	35	30
Finland	30	31	30	28	27	28	26
Sweden	45	53	43	41	45	46	46
UK	532	537	509	481	476	477	451

Source: NIDI calculations based on Eurostat.

Figure 23: Projected number of VET graduates aged 15-24, ISCED 3, by field of education ⁽¹⁸⁾, EU-27, 2005-30, baseline variant/constant education participation/constant graduation rates (000s)



Source: NIDI calculations based on Eurostat.

5.1.3. Teaching staff in IVET

The expected future decline in the number of students in IVET will affect the number of teaching staff needed in future. Though data do not allow allocating teaching staff to IVET specifically, some assumptions are possible. Assuming the average student/teacher ratios presented earlier in Table 11 are similar for both general and vocational education and training within ISCED 3 and keeping the student/teacher ratios constant, the number of teachers (in full-time units) can be estimated and projected for the whole projection interval. Of course, since student/teacher ratios are kept constant future trends are similar to trends in the future numbers of students. According to the projection almost 150 000 less teaching staff (in full-time units) will be needed around the year 2030 (Table 18).

⁽¹⁸⁾ Distribution unknown in France, Ireland, Malta, Portugal and the UK.

Table 18: Projected number of teachers in prevocational and vocational streams, ISCED 3, EU-27, 2005-50 (full-time units x 000s)

	2005	2010	2015	2020	2030	2050
EU-27	1 003	972	918	882	858	779
Belgium	48	49	48	47	45	44
Bulgaria	17	15	11	10	9	7
Czech Republic	31	29	24	21	22	18
Denmark	8	9	10	10	9	9
Germany	88	85	79	75	70	62
Estonia	2	1	1	1	1	1
Ireland	8	7	7	8	8	7
Greece	14	13	12	12	12	10
Spain	44	39	37	38	40	30
France	141	137	135	138	136	131
Italy	146	140	137	136	131	106
Cyprus	0.4	0.4	0.4	0.3	0.3	0.3
Latvia	3	3	2	2	2	2
Lithuania	0.9	0.8	0.7	0.6	0.5	0.5
Luxembourg	2	2	2	2	2	3
Hungary	10	9	8	7	7	7
Malta	0.4	0.4	0.4	0.3	0.3	0.4
Netherlands	62	65	67	68	63	65
Austria	20	20	20	18	17	16
Poland	72	63	52	44	41	36
Portugal	14	12	12	12	12	10
Romania	39	35	27	25	24	18
Slovenia	5	5	4	4	4	3
Slovakia	16	14	12	10	9	8
Finland	12	12	12	11	11	10
Sweden	17	19	18	16	18	18
UK	181	186	180	169	165	158

Source: NIDI calculations based on Eurostat.

5.1.4. Labour market consequences

Smaller future numbers of students and consequently smaller future numbers of graduates will mean fewer entrants into the labour market. Although it appears difficult to make reliable projections of the demand side of the labour market in the long term, this section will cautiously explore consequences of the previous educational projections for the future labour market.

Whether and to what extent labour-market shortages or mismatches will come about in future is not easy to foresee. Long-term labour demand projections by, for instance, occupational and

educational level are not available at European level at the time of this research ⁽¹⁹⁾, which makes it difficult to answer to what extent the supply of numbers of VET graduates will match labour-market demands in future and whether the qualifications of those students will match future demands. However, a usable set of long-term labour-force projections, produced by the European Commission Directorate-General for Economic and Financial Affairs (DG ECFIN), might provide some insight.

In 2005, DG ECFIN carried out long-term labour-force projections for each of the EU-25 Member States for the period up to 2050 in line with the Eurostat baseline variant. These labour-force projections are broken down by age (group), gender and Member State. The projections were undertaken to provide background technical input for assessing the potential economic and fiscal impact of an ageing population. The Carone study (2005) presents methodology and results of these labour-force projections. The report of the Economic Policy Committee and DG ECFIN (2006) presents additional projections on age-related expenditure covering pensions, health care, long-term care, education and unemployment transfers for EU-25 for the period up to 2050. The baseline projections assume ‘no policy change’ and are neither forecasts nor predictions in that they are not based on any assessment of more or less likely future changes in working patterns or economic conditions (Carone, 2005). The baseline projections consider both the trend in lifetime profiles of employment in different generations (cohorts) and the impact of recent pension reforms ⁽²⁰⁾.

The labour-force projections baseline scenario indicates that, notwithstanding a projected increase in employment rates and a reduction in unemployment rates, the pace of labour force and employment growth in EU-25 will be slightly positive until around 2017 and will turn negative after that up to 2050 (Carone, 2005). This is mainly the result of the combination of the decline of the working-age population and a shift in the age structure of the population towards older, less participating groups due to the baby-boom generation approaching retirement and succeeding smaller cohorts reaching working-age (Carone, 2005). Table 19 presents future employment in the 15-24 age group specifically, based on age-specific employment rates from the Carone study (2005) (Table B8 in Annex B). At EU level, employment in the 15-24 age group is (also) expected to decline. Exceptions to this general trend are Denmark, France, Luxembourg, the Netherlands and Sweden.

To explore labour-market consequences, the projected employment trends from Table 19 are compared to the projected future supply of VET graduates from Table 17. In Figure 24 trends in employment and numbers of graduates are compared by using indexed numbers (relative to the year 2005) for both trends in 2020 and 2030. Values above 100 denote increasing trends and values below 100 denote decreasing trends.

⁽¹⁹⁾ See footnote ⁽²⁴⁾.

⁽²⁰⁾ See Carone (2005) for a comprehensive discussion of the labour-force projections assumptions.

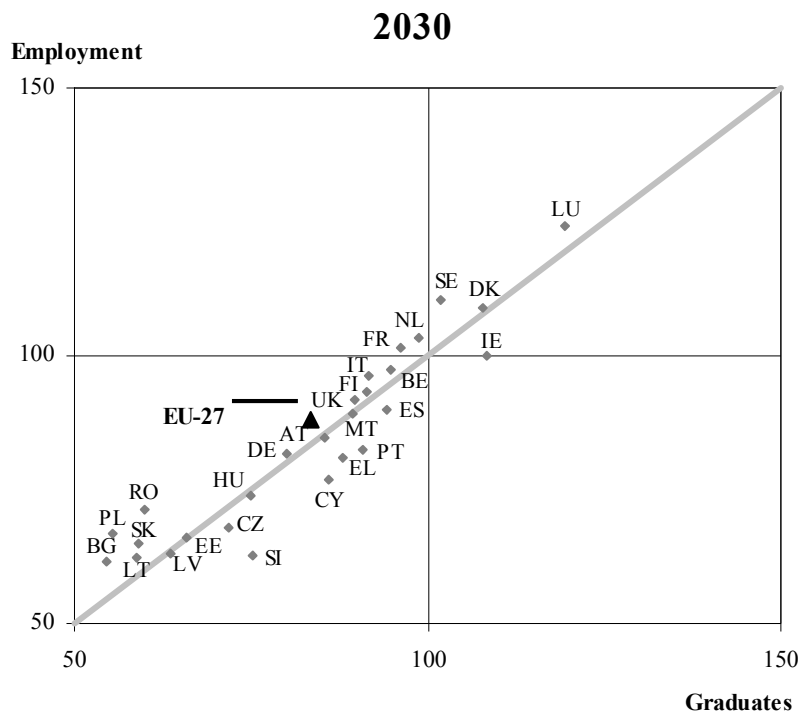
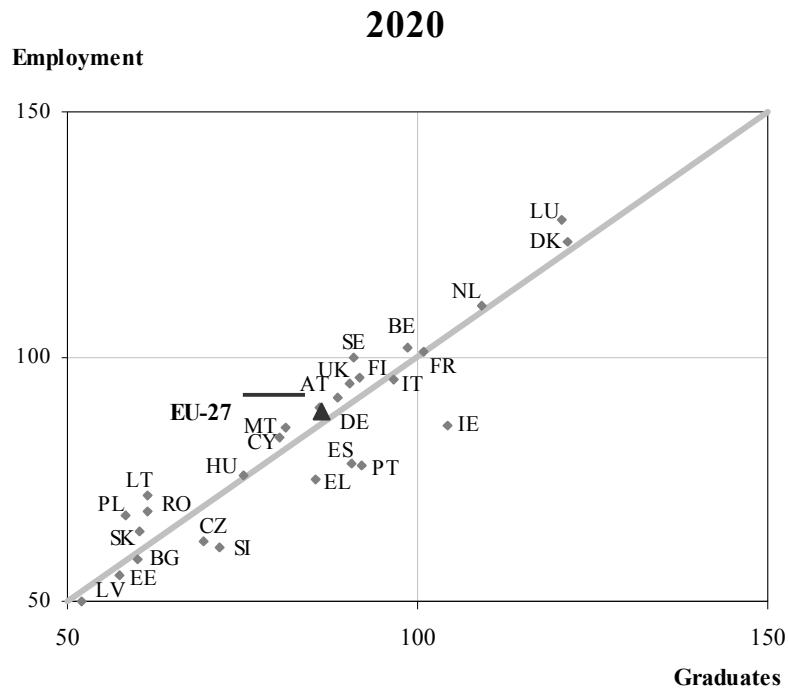
Table 19: Projected employment in the 15-24 age group, EU-27, 2005-50, labour force baseline scenario (000s)

	2005	2010	2015	2020	2025	2030	2050
EU-27*	23 318	23 243	22 126	20 731	20 679	20 512	18 625
Belgium	360	373	389	366	361	350	349
Bulgaria*	270	256	203	158	168	167	124
Czech Republic	395	377	339	246	258	269	234
Denmark	361	413	452	446	423	394	409
Germany	4 379	4 454	4 146	3 918	3 674	3 582	3 257
Estonia	65	67	49	36	39	43	34
Ireland	311	276	256	267	294	310	263
Greece	368	294	293	275	281	298	245
Spain	1 833	1 522	1 457	1 429	1 584	1 648	1 172
France	2 473	2 474	2 468	2 496	2 613	2 512	2 388
Italy	1 653	1 611	1 634	1 575	1 631	1 592	1 261
Cyprus	48	48	47	40	35	37	40
Latvia	124	131	96	62	68	78	63
Lithuania	125	140	124	90	75	78	74
Luxembourg	13	14	16	16	16	16	19
Hungary	356	346	325	269	259	263	245
Malta	28	27	27	24	23	25	26
Netherlands	1 338	1 420	1 457	1 479	1 466	1 383	1 420
Austria	529	535	531	484	458	449	419
Poland	1 494	1 389	1 185	1 007	1 004	999	968
Portugal	526	447	415	410	429	434	349
Romania*	831	868	648	568	583	593	452
Slovenia	73	62	50	45	44	46	43
Slovakia	249	223	194	161	161	162	147
Finland	274	281	287	261	252	256	245
Sweden	475	566	567	473	495	523	532
UK	4 369	4 628	4 470	4 129	3 986	4 007	3 848

* Bulgaria and Romania: estimations using Carone's (2005) average NMS-10 employment rates.

Source: NIDI calculations based on Carone (2005).

Figure 24: Indices of the projected number of VET graduates, ISCED 3-5, and projected employment in the 15-24 age group, by Member State, 2020 and 2030 (2005=100)



Source: NIDI calculations based on Eurostat and Carone (2005).

The majority of countries (and the EU-27 average) are positioned in the third (lower left) quadrant, characterised by both decreasing numbers of graduates and employment. In countries positioned on the diagonal the relative decline (or growth) of both the numbers of graduates and employment compared to the year 2005 are similar (for example France and Hungary in 2020 and Estonia and Latvia in 2030). In countries positioned above the diagonal the numbers of graduates are declining relative to employment (such as in Poland and Sweden as well as in the EU as a whole in both 2020 and 2030)⁽²¹⁾. This might indicate potential labour-market shortages for graduates in VET. However, a positive effect of future labour demand shortages from the perspective of young graduates in VET entering the labour market, might be a favourable competitive position for those relatively scarce young graduates. On the other hand, in countries positioned below the diagonal the numbers of graduates are increasing relative to employment (such as Ireland, Greece, Portugal and Slovenia in both 2020 and 2030)⁽²²⁾. This might indicate a relative increase in labour force supply of graduates in VET.

5.2. Alternative scenarios

The three alternative scenarios comprise the ‘high population’ variant, the ‘low population’ variant and the ‘increased participation’ variant, as described in Chapter 4. The ‘high population’ and the ‘low population’ variant assess the impact of different demographic assumptions, high population growth and low population growth, under the same education participation assumptions as the baseline scenario. The ‘increased participation’ variant assesses the extent to which participation rates in prevocational and vocational streams have to be increased to maintain the current level of number of IVET students and graduates.

Table 20 shows the differences in the numbers of students according to the alternative scenarios compared to the baseline scenario. The number of students in IVET turns out to be around 16 % higher in the ‘high population’ scenario, around 15 % lower in the ‘low population scenario’, and around 20 % higher in the ‘increased participation’ scenario.

Even in the ‘high population’ scenario, with high fertility rates, high life expectancy and high net immigration, the number of students in IVET is expected to decline in the near future (Tables 21 and 22). Until around 2020 the numbers decline, but thereafter the number of students is expected to recover. However, the level in 2030 is still 4 % lower than in 2005.

⁽²¹⁾ In the third quadrant decrease of the number of graduates is stronger than the decrease of employment and in the first quadrant increase of the number of graduates is smaller than the increase of employment.

⁽²²⁾ In the third quadrant decrease of employment is stronger than the decrease of the number of graduates and in the first quadrant increase of employment is smaller than the increase of the number of graduates.

Table 20: Differences of the projected number of students in prevocational and vocational streams to the baseline scenario, by ISCED level, age group and alternative scenario, EU-27, 2005-50 (000s)

Scenario	ISCED	Age group	2010	2015	2020	2025	2030	2050
High population	ISCED 2	15-24	-12	-21	-18	1	10	9
	ISCED 3	15-24	-45	23	125	927	1 560	2 452
	ISCED 4	15-24	1	51	67	124	182	274
	ISCED 5	15-24	13	-4	-31	-3	94	246
	ISCED 2-5	15-19	-17	59	168	978	1 575	2 440
	ISCED 2-5	20-24	-26	-11	-23	70	270	541
	ISCED 2-5	15-24	-43	49	145	1 049	1 846	2 981
Low population	ISCED 2	15-24	-14	-25	-27	-31	-38	-60
	ISCED 3	15-24	-192	-217	-302	-904	-1 428	-2 027
	ISCED 4	15-24	-16	26	34	35	-33	-92
	ISCED 5	15-24	-13	-45	-84	-137	-234	-325
	ISCED 2-5	15-19	-153	-166	-248	-912	-1 410	-1 946
	ISCED 2-5	20-24	-81	-95	-132	-125	-322	-558
	ISCED 2-5	15-24	-234	-261	-380	-1 037	-1 733	-2 504
Increased participation	ISCED 2	15-24	7	3	9	14	15	19
	ISCED 3	15-24	597	1 370	1 549	1 740	1 900	2 840
	ISCED 4	15-24	17	152	199	237	239	323
	ISCED 5	15-24	43	147	180	181	192	327
	ISCED 2-5	15-19	546	1 297	1 494	1 688	1 839	2 738
	ISCED 2-5	20-24	117	375	443	485	509	772
	ISCED 2-5	15-24	663	1 672	1 937	2 173	2 347	3510

Source: NIDI calculations based on Eurostat.

In the ‘low population’ scenario, fertility rates, life expectancy and net immigration are assumed to lag behind the baseline scenario. Consequently the numbers of students in prevocational and vocational streams are expected to be much lower than in the ‘baseline’ scenario (Tables 23 and 24). In 2030 the number of students is around 30 % lower than in 2005.

The third scenario, the ‘increased participation’ scenario, is a normative scenario, which assumes participation in prevocational and vocational streams can be increased in such a way that the total numbers of students in prevocational and vocational streams will remain more or less at their current levels. As can be observed in Table 25 the numbers of students remain stable⁽²³⁾. However, to what extent do participation rates have to be increased to keep the

⁽²³⁾ The initial projections include the 10-14 age group as well. The number of students was kept stable for the whole 10-24 age group. This affects ISCED levels 2 and 3, since part of the students at these levels are below the age of 15. Due to changes of the age distribution in the 10-24 age group, the total number of students at ISCED levels 2 and 3 in the 15-24 age group are not exactly stable.

numbers constant? Table 26 presents the projected participation rates in prevocational and vocational streams by ISCED level and age group. Participation rates in prevocational and vocational streams will have to be increased by around 20 % in 2030 to maintain the current number of students. At ISCED 3 this particularly means a substantial shift from general streams to prevocational and vocational streams, since participation is already very high at this educational level (especially in the 15-19 age group). As a reference to this specific scenario two extra variants were calculated, a combination of the ‘increased participation’ target combined with the high and low population variants respectively. To keep the future number of students at their current levels in these variants, the required participation increase is more or less in line with the ‘baseline’ variant (Table 26) up to 2020: slightly lower in the high population variant and slightly higher in the low population variant (Tables 27 and 28). However, in 2030 participation rates will have to be increased on average by around 5 % in the high population variant and by around 40 % in the low population variant compared to current participation rates.

Table 21: Projected population and number of students in prevocational and vocational streams, by ISCED level and age group, EU-27, 2005-50, high population variant/constant education participation (000s)

	Age group	2005	2010	2015	2020	2025	2030	2050
Population	15-19	30 372	28 692	26 628	26 585	28 254	29 466	29 241
	20-24	31 990	31 164	29 414	27 376	27 414	29 180	30 029
	Total	62 362	59 856	56 042	53 961	55 668	58 647	59 270
ISCED 2-5	15-19	11 244	10 611	9 866	9 835	10 487	10 931	10 843
	20-24	3 023	2 969	2 759	2 605	2 625	2 804	2 859
	Total	14 267	13 580	12 625	12 440	13 112	13 736	13 702
ISCED 2	15-19	162	148	141	143	153	158	157
	20-24	11	11	10	10	10	10	11
	Total	173	159	152	153	163	169	168
ISCED 3	15-19	10 195	9 593	8 944	8 918	9 526	9 923	9 839
	20-24	1 346	1 324	1 232	1 162	1 171	1 251	1 276
	Total	11 541	10 918	10 177	10 080	10 697	11 174	11 116
ISCED 4	15-19	370	364	326	324	337	355	354
	20-24	624	613	566	537	542	580	590
	Total	994	976	892	861	879	935	943
ISCED 5	15-19	516	506	454	450	470	495	493
	20-24	1 042	1 021	950	896	902	963	983
	Total	1 559	1 527	1 404	1 346	1 372	1 458	1 475

Source: NIDI calculations based on Eurostat.

Table 22: Index of the projected population and number of students in prevocational and vocational streams, by ISCED level and age group, EU-27, 2005-50, high population variant/constant education participation (2005=100)

	Age group	2005	2010	2015	2020	2025	2030	2050
Population	15-19	100	94	88	88	93	97	96
	20-24	100	97	92	86	86	91	94
	Total	100	96	90	87	89	94	95
ISCED 2-5	15-19	100	94	88	87	93	97	96
	20-24	100	98	91	86	87	93	95
	Total	100	95	88	87	92	96	96
ISCED 2	15-19	100	92	87	89	95	98	97
	20-24	100	97	92	86	86	91	94
	Total	100	92	88	88	94	98	97
ISCED 3	15-19	100	94	88	87	93	97	97
	20-24	100	98	92	86	87	93	95
	Total	100	95	88	87	93	97	96
ISCED 4	15-19	100	98	88	87	91	96	95
	20-24	100	98	91	86	87	93	95
	Total	100	98	90	87	88	94	95
ISCED 5	15-19	100	98	88	87	91	96	95
	20-24	100	98	91	86	87	92	94
	Total	100	98	90	86	88	94	95

Source: NIDI calculations based on Eurostat.

Table 23: Projected population and number of students in prevocational and vocational streams, by ISCED level and age group, EU-27, 2005-50, low population variant/constant education participation (000s)

	Age group	2005	2010	2015	2020	2025	2030	2050
Population	15-19	30 295	28 321	26 017	25 402	23 220	21 454	17 426
	20-24	31 875	30 557	28 479	26 176	25 567	23 398	18 519
	Total	62 170	58 878	54 496	51 578	48 787	44 852	35 946
ISCED 2-5	15-19	11 216	10 474	9 641	9 420	8 596	7 946	6 457
	20-24	3 012	2 914	2 675	2 496	2 430	2 212	1 760
	Total	14 228	13 389	12 316	11 916	11 026	10 158	8 218
ISCED 2	15-19	161	146	138	134	122	113	92
	20-24	11	11	10	9	9	8	7
	Total	173	157	148	143	131	121	99
ISCED 3	15-19	10 170	9 471	8 742	8 539	7 782	7 198	5 852
	20-24	1 341	1 300	1 195	1 114	1 084	988	786
	Total	11 511	10 771	9 937	9 653	8 866	8 186	6 638
ISCED 4	15-19	369	358	318	312	289	265	215
	20-24	621	601	549	515	501	455	363
	Total	991	960	867	827	790	720	577
ISCED 5	15-19	515	499	443	434	403	369	299
	20-24	1 039	1 002	921	858	836	761	605
	Total	1 554	1 501	1 364	1 292	1 238	1 130	904

Source: NIDI calculations based on Eurostat.

Table 24: Index of the projected population and number of students in prevocational and vocational stream, by ISCED level and age group, EU-27, 2005-50, low population variant/constant education participation (2005=100)

	Age group	2005	2010	2015	2020	2025	2030	2050
Population	15-19	100	93	86	84	77	71	58
	20-24	100	96	89	82	80	73	58
	Total	100	95	88	83	78	72	58
ISCED 2-5	15-19	100	93	86	84	77	71	58
	20-24	100	97	89	83	81	73	58
	Total	100	94	87	84	77	71	58
ISCED 2	15-19	100	91	86	83	75	70	57
	20-24	100	96	89	82	80	73	58
	Total	100	91	86	83	76	70	57
ISCED 3	15-19	100	93	86	84	77	71	58
	20-24	100	97	89	83	81	74	59
	Total	100	94	86	84	77	71	58
ISCED 4	15-19	100	97	86	84	78	72	58
	20-24	100	97	88	83	81	73	58
	Total	100	97	87	83	80	73	58
ISCED 5	15-19	100	97	86	84	78	72	58
	20-24	100	96	89	83	80	73	58
	Total	100	97	88	83	80	73	58

Source: NIDI calculations based on Eurostat.

Table 25: Projected population and number of students in prevocational and vocational streams, by ISCED level and age group, EU-27, 2005-50, baseline variant/increased education participation (000s)

	Age group	2005	2010	2015	2020	2025	2030	2050
Population	15-19	30 333	28 498	26 298	25 955	25 695	25 232	22 368
	20-24	31 935	30 866	28 931	26 739	26 429	26 214	23 393
	Total	62 268	59 364	55 229	52 694	52 124	51 446	45 761
ISCED 2-5	15-19	11 229	11 174	11 104	11 161	11 196	11 195	11 141
	20-24	3 018	3 112	3 144	3 071	3 039	3 042	3 090
	Total	14 247	14 286	14 248	14 232	14 236	14 237	14 231
ISCED 2	15-19	161	166	163	168	164	163	166
	20-24	11	12	12	12	12	12	12
	Total	173	178	175	180	176	175	178
ISCED 3	15-19	10 182	10 113	10 052	10 075	10 113	10 115	10 059
	20-24	1 343	1 447	1 472	1 429	1 397	1 399	1 446
	Total	11 526	11 559	11 524	11 504	11 511	11 514	11 505
ISCED 4	15-19	370	376	373	384	390	389	389
	20-24	623	617	619	608	603	603	604
	Total	992	992	992	992	992	992	992
ISCED 5	15-19	516	520	515	535	529	528	528
	20-24	1 041	1 037	1 041	1 022	1 027	1 029	1 029
	Total	1 556	1 556	1 556	1 556	1 556	1 556	1 556

Source: NIDI calculations based on Eurostat.

Table 26: Projected student participation rates in prevocational and vocational streams, by ISCED level and age group, EU-27, 2005-50, baseline variant/increased education participation (%)

	Age group	2005	2010	2015	2020	2025	2030	2050
ISCED 2-5	15-19	37.0	39.2	42.2	43.0	43.6	44.4	49.8
	20-24	9.5	10.1	10.9	11.5	11.5	11.6	13.2
	Total	22.9	24.1	25.8	27.0	27.3	27.7	31.1
ISCED 2	15-19	0.5	0.6	0.6	0.6	0.6	0.6	0.7
	20-24	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	Total	0.3	0.3	0.3	0.3	0.3	0.3	0.4
ISCED 3	15-19	33.6	35.5	38.2	38.8	39.4	40.1	45.0
	20-24	4.2	4.7	5.1	5.3	5.3	5.3	6.2
	Total	18.5	19.5	20.9	21.8	22.1	22.4	25.1
ISCED 4	15-19	1.2	1.3	1.4	1.5	1.5	1.5	1.7
	20-24	1.9	2.0	2.1	2.3	2.3	2.3	2.6
	Total	1.6	1.7	1.8	1.9	1.9	1.9	2.2
ISCED 5	15-19	1.7	1.8	2.0	2.1	2.1	2.1	2.4
	20-24	3.3	3.4	3.6	3.8	3.9	3.9	4.4
	Total	2.5	2.6	2.8	3.0	3.0	3.0	3.4

Source: NIDI calculations based on Eurostat.

Table 27: Projected student participation rates in prevocational and vocational streams, by ISCED level and age group, EU-27, 2005-50, high population variant/increased education participation (%)

	Age group	2005	2010	2015	2020	2025	2030	2050
ISCED 2-5	15-19	37.0	39.2	41.9	42.2	40.0	38.3	38.4
	20-24	9.4	9.9	10.5	10.9	10.6	10.1	10.0
	Total	22.9	23.9	25.4	26.3	25.5	24.3	24.0
ISCED 2	15-19	0.5	0.6	0.6	0.6	0.6	0.5	0.5
	20-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.3	0.3	0.3	0.3	0.3	0.3	0.3
ISCED 3	15-19	33.6	35.5	38.0	38.2	36.2	34.7	34.8
	20-24	4.2	4.5	4.7	4.8	4.6	4.4	4.4
	Total	18.5	19.4	20.6	21.3	20.6	19.6	19.4
ISCED 4	15-19	1.2	1.3	1.4	1.4	1.3	1.3	1.3
	20-24	1.9	2.0	2.1	2.3	2.2	2.1	2.1
	Total	1.6	1.7	1.8	1.8	1.8	1.7	1.7
ISCED 5	15-19	1.7	1.8	1.9	2.0	1.9	1.8	1.8
	20-24	3.3	3.3	3.6	3.8	3.7	3.5	3.5
	Total	2.5	2.6	2.8	2.9	2.8	2.7	2.6

Source: NIDI calculations based on Eurostat.

Table 28: Projected student participation rates in prevocational and vocational streams, by ISCED level and age group, EU-27, 2005-50, low population variant/increased education participation (%)

	Age group	2005	2010	2015	2020	2025	2030	2050
ISCED 2-5	15-19	37.0	39.6	42.8	44.4	48.1	52.1	61.4
	20-24	9.5	10.0	10.8	11.4	12.1	13.1	16.0
	Total	22.9	24.2	26.1	27.6	29.2	31.8	38.0
ISCED 2	15-19	0.5	0.6	0.6	0.6	0.7	0.7	0.9
	20-24	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	Total	0.3	0.3	0.3	0.3	0.4	0.4	0.5
ISCED 3	15-19	33.6	35.9	38.9	40.2	43.6	47.3	55.4
	20-24	4.2	4.6	4.9	5.1	5.5	5.9	6.9
	Total	18.5	19.6	21.1	22.4	23.7	25.7	30.4
ISCED 4	15-19	1.2	1.3	1.4	1.5	1.6	1.7	2.1
	20-24	1.9	2.0	2.2	2.4	2.5	2.7	3.4
	Total	1.6	1.7	1.8	1.9	2.0	2.2	2.8
ISCED 5	15-19	1.7	1.8	1.9	2.1	2.2	2.4	2.9
	20-24	3.3	3.4	3.7	3.9	4.1	4.5	5.6
	Total	2.5	2.6	2.9	3.0	3.2	3.5	4.3

Source: NIDI calculations based on Eurostat.

6. Conclusions: key findings and policy implications

During the next decades Europe will be inevitably confronted with an ageing population. It is due to increased longevity and ageing of the large post-war birth cohorts, resulting in growing numbers of older people. At the same time, the number of younger people is expected to decrease as birth rates are declining. The large size differences between older and younger cohorts will change the age structure of the European future labour force to a large extent. Demographic developments will also affect students in (vocational) education and training.

In EU-27, the number of people aged 15-24 is expected to decline in the period 2005 to 2020 according to all Eurostat population variants. In the period 2005 to 2030, the young population will decrease from 62 million to 51 million (a decline of 17 %) and in the long term, around 2050, to 46 million (a decline of more than 25 %) according to the baseline variant. In the high population variant the 15-24 age group will decrease to 60 million in 2030 and in the low population variant to 42 million.

Assuming education and training participation rates remain unchanged in future, the number of VET students aged 15-24 will decrease in line with the decline of the total population in this age group. The number of students in prevocational and vocational streams at ISCED 2-5, is expected to decrease from 14.2 million in 2005 to 11.9 million in 2030 according to the baseline variant. The decrease is particularly significant at upper secondary level (ISCED 3) in absolute numbers: from 11.5 million in 2005 to 9.6 million in 2030, a decline of almost 2 million. Especially in the period 2009-15 the decline is steep.

There are variations between Member States, though. Germany and newer Member States are expected to experience substantial decrease: together they account for 73 % of the total decline of students in prevocational and vocational streams at ISCED 2-5 by 2030 in the EU as a whole. In absolute numbers Germany and Poland are expected to have the largest decrease, 478 000 and 500 000 respectively. Only a few Member States – such as Denmark, Ireland and Luxembourg – are likely to experience growth of VET students.

Even the high population scenario foresees a decline in student numbers at ISCED 2-5 by more than 10 % until 2020. Although afterwards the number of students is expected to recover, in 2030 it is still 4 % lower compared to 2005. A low population scenario makes the situation even worse: in 2030 there will be 4 million less students than in 2005, a decline of around 30 %.

Assuming unchanged graduation rates, the number of graduates in IVET will decline in proportion to the number of students. According to the baseline scenario in 2030 there will be 600 000 fewer graduates (ISCED 3-5) compared to 2005. Regarding distribution of graduates by field of education, it remains fairly stable. Though, a slight shift from ‘engineering,

manufacturing and construction' towards 'science, mathematics and computing' can be observed (ISCED 3).

The decreasing number of students in IVET will have far-reaching implications for teacher and trainer recruitment, infrastructure requirements as well as the labour market.

If student/teacher ratios – and other factors, such as quality of training, time teachers work with students – remain the same, the required number of teaching staff in IVET might be much less than nowadays. Assuming student/teacher ratios are similar for both, general and vocational streams, it is estimated that 150 000 fewer teaching staff (in full-time units) will be needed in 2030 at ISCED 3, compared to 2005. It is important to note, however, that although the level of VET teachers' employment is projected to decline, some Member States are likely to experience demand for this profession due to replacement demand (to replace teachers leaving for retirement or other reasons).

Similarly, the decreasing number of IVET students will – *ceteris paribus* – most likely need less capacity in terms of type, size and number of VET facilities (school buildings, workshops, labs, classrooms, etc.). This might affect the organisation of institutions but could also help accommodate expanding continuing training offers (see below).

Trying to keep the absolute number of students at current levels, thus preventing potential contraction of VET system capacity, would require a 20 % increase in participation rates in IVET around 2030, according to the baseline scenario. Since education participation rates are already rather high, particularly in the 15-19 age group, this would mean a substantial shift of enrolment from general to prevocational and vocational streams. This raises a question: what balance is needed between general and vocational education and training?

Fewer future students and graduates will mean fewer entrants into the labour market. Whether and to what extent labour-market shortages or mismatches will come about in future is difficult to foresee. At the time of this research, reliable, long-term labour demand forecasts by occupational and educational characteristics were not available which makes it difficult to answer to what extent future supply of VET graduates, in terms of their number and qualifications, will match future labour-market demands ⁽²⁴⁾.

Some insight is provided by comparing projected supply of VET graduates with projected employment trends (the latter based on the long-term labour force projections by Carone, 2005). Some countries, for example Lithuania, Luxembourg, Poland, Romania, Slovakia, Sweden, as well as the EU as a whole, are expected to experience a higher decline of VET

⁽²⁴⁾ After completion of this study, in 2008, Cedefop delivered medium-term forecasts (until 2015 and 2020) of occupational skill needs in Europe. The forecasts provide detailed data on future developments by economic sector, occupation and skill at EU-25 level and for each Member State separately. Available from Internet: http://www.trainingvillage.gr/etv/Projects_Networks/Skillsnet/forecasting.asp [cited 13.8.2008]. Currently, Cedefop is working on a complementary forecast of skill supply in EU-27 to be able to identify potential future labour-market imbalances. The results are expected at the beginning of 2009.

graduates than projected employment growth in both 2020 and 2030, which might indicate potential labour-market shortages for people with these qualifications. On labour-market shortages, it could be argued that young VET graduates will enjoy a favourable competitive position in the labour market, due to their scarcity compared to other (older) workers. It should not, however, be assumed that the fewer young VET graduates alone will ease their access to the labour market. Adequate education and skill levels will remain an important factor determining employment security and future older-age cohorts are likely to benefit from higher levels of training (European Commission, 2006). In countries such as the Czech Republic, Ireland, Greece, Spain, Portugal and Slovenia the future supply of VET graduates is increasing more than employment growth in both, 2020 and 2030.

According to the Carone study, up to around 2017 the labour force and employment growth in EU-25 is expected to increase slightly, but after that to decline due to demographic ageing. The strong demographic changes cannot easily, if at all, be overcome. In fact, there are only a few options, such as increasing birth rates, increasing immigration and increasing labour-force participation.

Increasing birth-rates does not seem very likely considering current demographic trends and its causes. As for the other possible solutions, are they realistic, and what are the implications for VET?

Increasing migration certainly cannot be considered as the sole remedy for ageing: migration flows would need to be very large if the current age structure is to be maintained. Nevertheless, migration could serve as a policy option aiming at balancing short-term shortages on European labour markets through selective migration (Bijak et al., 2005). Future immigrants would need to come, however, from outside Europe to avoid that migration only shifts labour-market problems geographically within Member States or European regions. While it is uncertain to what extent attracting new migrants will help to solve labour-market shortages, it is clear that VET will have a key role to play in their labour market and social integration. Migrants are generally found to have lower employment and higher unemployment rates (Berkhout et al., 2007). Children and youth with migrant backgrounds often perform less well in education and training than the native population and have poorer employment opportunities.

What is important for VET is that there is no uniform policy response to address immigrants' needs. Migrants are not a single group with similar characteristics, training needs or attitudes towards learning. Most European countries have low as well as highly skilled immigrants. In the Czech Republic, France and Sweden, for instance, immigrants are overrepresented among both the low-skilled and the high-skilled; Ireland, Portugal and the UK show substantive overrepresentation of high-skilled immigrants, whereas in countries such as Belgium, Germany, the Netherlands and Austria, the low-skilled are overrepresented. While low-skilled migrants might need to acquire basic and adequate work-related skills, high-skilled migrants might need no or relatively less training for their immediate employability. However, both

groups are likely to require vocationally-oriented language skills and specifically tailored guidance and counselling.

Increasing labour-force participation would need to focus on those groups which are currently underrepresented, namely young people, women, older workers and also migrants (see also above). However, increasing labour-force participation rates of young people might decrease education and training participation rates and thus affect enrolment in IVET negatively. This would conflict with the EU's education and training policy aim to improve educational levels of European citizens for the knowledge-based society.

Thus, policies aiming at increasing labour-force participation of women, older workers and migrants may be most effective in curbing the consequences of demographic change. As a result, there will be a greater need for continuing VET and lifelong learning programmes. The challenge for European VET will be to target the diversified groups adequately as they have different needs. More flexible arrangements might be necessary for shorter courses, refreshing courses, more on-the-job training and better arrangements to combine (part-time) jobs, education and childcare.

The nature of future demographic and labour-force changes in the EU is quite clear. How to deal with their consequences, however, is another matter. Europe will be in the rather unique position of being the first large world region to face population decline and severe population ageing; two processes without precedent in this magnitude and thus no simple solutions are available that could be learned or copied from others.

However, it is important to underline that demographic change should not be seen only as a threat or risk but also as an opportunity. Potential (public) budgetary savings resulting from falling numbers of students could be used to improve the quality and effectiveness of VET. This might include increased and targeted learner support, smaller student-teacher ratios, more and better teacher and trainer training throughout their careers, investment in adequate buildings and up-to-date technological equipment. More and better training measures could be provided to specific groups, underrepresented in training and/or employment participation. Demographic change offers unprecedented opportunities to deepen rather than widen investment in human capital.

This study aimed to provide insight into the implications of future demographic trends for IVET in the EU. The scope of this study was limited to outline a more general picture without particular attention to country-specific circumstances. Further research is necessary to address country-specific problems, particularly with respect to countries with above average ageing populations such as newer Member States.

7. List of abbreviations

EU-15	European Union (up to 2003; 15 Member States)
EU-25	European Union (up to 2006; 25 Member States)
EU-27	European Union (up to now; 27 Member States)
IVET	Initial vocational education and training
NMS-10	(Former) new Member States (the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia)
VET	Vocational education and training

Country codes

BE	Belgium
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
DE	Germany
EE	Estonia
IE	Ireland
EL	Greece
ES	Spain
FR	France
IT	Italy
CY	Cyprus
LV	Latvia
LT	Lithuania

LU	Luxembourg
HU	Hungary
MT	Malta
NL	Netherlands
AT	Austria
PL	Poland
PT	Portugal
RO	Romania
SI	Slovenia
SK	Slovakia
FI	Finland
SE	Sweden
UK	United Kingdom

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Annex A International standard classification of education

Educational data are classified according to the International standard classification of education (ISCED), revised in 1997 (Unesco, 2006). The classification distinguishes seven levels of education: pre-primary education (ISCED 0), primary education or first stage of basic education (ISCED 1), lower secondary or second stage of basic education (ISCED 2), (upper) secondary education (ISCED 3), post secondary non-tertiary education (ISCED 4), first stage of tertiary education (not leading directly to an advanced research qualification) (ISCED 5) and second stage of tertiary education (leading to an advanced research qualification) (ISCED 6). In this report analyses are restricted to ISCED levels 2 to 5.

ISCED 2 – Lower secondary education or second stage of basic education

The contents of education at this stage are typically designed to complete the provision of basic education which began at ISCED level 1. In many, if not most countries, the educational aim is to lay the foundation for lifelong learning and human development on which countries may expand, systematically, further educational opportunities. Programmes at this level are usually on a more subject-oriented pattern using more specialised teachers and more often several teachers conducting classes in their field of specialisation. Full implementation of basic skills occurs at this level. The end of this level often coincides with the end of compulsory education.

ISCED 2A: programmes designed for direct access to level 3 in a sequence which would ultimately lead to tertiary education, entrance to ISCED 3A or 3B;

ISCED 2B: programmes designed for direct access to programmes at level 3C;

ISCED 2C: programmes primarily designed for direct access to the labour market at the end of this level (sometimes referred to as ‘terminal’ programmes).

The second complementary dimension subdivides the programmes into three categories (or streams):

- (a) general education: education which is mainly designed to lead participants to a deeper understanding of a subject or group of subjects, especially, but not necessarily, with a view to preparing participants for further (additional) education at the same or a higher level. Successful completion of these programmes may or may not provide participants with a labour-market relevant qualification at this level. These programmes are typically school-based. Programmes with a general orientation and not focusing on a particular specialisation should be classified in this category;
- (b) prevocational or pretechnical education: education which is mainly designed to introduce participants to the world of work and to prepare them for entry into vocational or technical education programmes. Successful completion of such programmes does not

lead to a labour-market relevant vocational or technical qualification. For a programme to be considered as prevocational or pretechnical education, at least 25 % of its content has to be vocational or technical;

- (c) vocational or technical education: education which is mainly designed to lead participants to acquire practical skills, know-how and understanding necessary for employment in a particular occupation or trade or class of occupations or trades. Successful completion of such programmes leads to a labour-market relevant vocational qualification recognised by the competent authorities in the country in which it is obtained.

ISCED 3 – upper secondary education

This level of education typically begins at the end of full-time compulsory education. More specialisation may be observed at this level than at ISCED level 2 and often teachers need to be more qualified or specialised than for ISCED level 2. The entrance age is typically 15 or 16. The educational programmes included at this level typically require completion of some nine years of full-time education (since the beginning of level 1) for admission or a combination of education and vocational or technical experience.

ISCED 3A: programmes designed to provide direct access to ISCED 5A;

ISCED 3B: programmes designed to provide direct access to ISCED 5B;

ISCED 3C: programmes not designed to lead directly to ISCED 5A or 5B. Therefore, these programmes lead directly to the labour market, ISCED 4 programmes or other ISCED 3 programmes.

The second complementary dimension has the same categories (or streams) as for level 2: general, prevocational or pretechnical and vocational or technical education.

ISCED 4 – Post-secondary non-tertiary education

ISCED 4 captures programmes that straddle the boundary between upper-secondary and post-secondary education from an international point of view, even though they might clearly be considered as upper-secondary or post-secondary programmes in a national context. These programmes can, considering their content, not be regarded as tertiary programmes. They are often not significantly more advanced than programmes at ISCED 3 but they serve to broaden the knowledge of participants who have already completed a programme at level 3. Typical examples are programmes designed to prepare students for studies at level 5 who, although having completed ISCED level 3, did not follow a curriculum which would allow entry to level 5, pre-degree foundation courses or short vocational programmes. Second cycle programmes can be included as well.

ISCED 4A: programmes that prepare for entry to ISCED 5

ISCED 4B: programmes not giving access to level 5 (primarily designed for direct labour market entry).

The second complementary dimension has the same categories (or streams) as for levels 2 and 3: general, prevocational or pretechnical and vocational or technical education.

ISCED 5 – First stage of tertiary education

This level consist of tertiary programmes having an educational content more advanced than those offered at levels 3 and 4. Entry to these programmes normally requires successful completion of ISCED level 3A or 3B or a similar qualification at ISCED level 4A. These programmes do not lead directly to the award of an advanced research qualification (ISCED 6). They must have a cumulative theoretical duration of at least two years.

ISCED 5A: programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements.

ISCED 5B: programmes that are practically oriented/occupationally specific and are mainly designed for participants to acquire practical skills, and know-how needed for employment in a particular occupation or trade or class of occupations or trades – successful completion of which usually provides participants with a labour-market relevant qualification.

Data classified by ISCED level and category (or stream) are available from the Eurostat harmonised dataset on education and training. Theoretically, prevocational education and training does exist at ISCED 4 as well, however in practice it is not available in the statistics of any EU-27 Member States. VET at ISCED 5 is considered to be similar to ISCED 5B.

Summarising, the ISCED classification comprises the following three streams of education relevant to the study at hand.

General	general education and training at ISCED levels 2, 3, 4 and 5
Prevocational	prevocational education and training at ISCED levels 2 and 3
Vocational	vocational education and training at ISCED levels 2, 3, 4 and 5

Additionally, the ISCED classification comprises 25 fields of education (at two-digit level) which can be further refined into three-digit levels. The following broad groups (at one-digit level) can be distinguished.

0	General	General programmes
1	Education	Teacher training and education science
2	Arts	Humanities and arts
3	Business	Social sciences, business and law
4	Science	Science, mathematics and computing
5	Manufacturing	Engineering, manufacturing and construction
6	Agriculture	Agriculture and veterinary
7	Health	Health and welfare
8	Services	Services
9	Unknown	Unknown or not specified

Annex B Methodological details

Table B1: Total fertility rate assumptions in 2030 of Eurostat long-term population projections for the baseline, high population and low population variants

	2004	2030		
		Base	High	Low
Belgium	1.62	1.70	1.95	1.50
Bulgaria	1.20	1.44	1.81	1.23
Czech Republic	1.15	1.50	1.90	1.30
Denmark	1.76	1.79	2.00	1.50
Germany	1.35	1.45	1.75	1.25
Estonia	1.39	1.60	1.99	1.40
Ireland	1.97	1.80	2.00	1.60
Greece	1.29	1.50	1.75	1.20
Spain	1.30	1.40	1.70	1.20
France	1.89	1.85	2.10	1.60
Italy	1.31	1.40	1.70	1.20
Cyprus	1.47	1.50	1.90	1.30
Latvia	1.30	1.59	1.99	1.39
Lithuania	1.29	1.55	1.94	1.35
Luxembourg	1.65	1.79	2.00	1.49
Hungary	1.30	1.59	1.99	1.39
Malta	1.66	1.60	2.00	1.40
Netherlands	1.75	1.75	2.00	1.50
Austria	1.40	1.45	1.75	1.25
Poland	1.21	1.58	1.98	1.38
Portugal	1.45	1.60	1.80	1.30
Romania	1.29	1.47	1.86	1.25
Slovenia	1.18	1.50	1.90	1.30
Slovakia	1.19	1.52	1.91	1.30
Finland	1.76	1.80	2.00	1.50
Sweden	1.74	1.85	2.09	1.60
UK	1.72	1.75	2.00	1.50
EU-27	1.47	1.59	1.88	1.36

Source: Eurostat (2006).

Table B2: Life expectancy assumptions in 2030 of Eurostat long-term population projections for the baseline, low population and high population variants

	Males				Females			
	2004	2030			2004	2030		
		Base	High	Low		Base	High	Low
Belgium	75.5	80.4	81.6	79.4	81.6	86.5	87.5	85.6
Bulgaria	69.1	75.5	77.1	73.9	75.8	80.7	82.1	79.2
Czech Republic	72.4	77.8	79.3	76.3	78.8	82.7	83.9	81.4
Denmark	75.2	79.3	80.4	78.2	79.6	82.5	83.7	81.5
Germany	76.1	80.2	81.5	79.1	81.7	85.4	86.5	84.5
Estonia	65.5	71.6	72.9	70.2	76.9	81.2	82.5	79.8
Ireland	75.5	80.2	81.6	79.0	80.7	84.9	86.2	83.8
Greece	76.4	78.9	80.2	77.9	81.4	84.0	85.0	83.2
Spain	76.6	80.2	81.5	79.0	83.4	86.9	87.9	86.0
France	76.2	80.8	82.1	79.8	83.4	87.5	88.5	86.6
Italy	77.3	81.5	82.9	80.8	83.2	86.8	88.1	86.3
Cyprus	76.3	80.2	82.5	77.9	80.8	83.7	85.5	81.8
Latvia	64.9	70.9	72.2	69.5	76.2	80.4	81.6	79.1
Lithuania	66.5	72.3	73.5	71.1	77.6	81.8	83.0	80.5
Luxembourg	75.0	79.9	81.1	78.8	81.4	85.1	86.3	84.1
Hungary	68.5	75.2	77.0	73.3	76.8	81.5	83.0	79.9
Malta	76.3	80.1	82.6	77.7	80.7	83.7	85.9	81.7
Netherlands	76.2	79.0	80.1	78.1	80.9	82.8	83.9	81.8
Austria	76.2	81.0	82.1	80.1	82.1	86.1	87.1	85.3
Poland	70.5	76.8	78.4	75.2	78.5	82.8	84.3	81.4
Portugal	74.2	78.5	80.0	77.3	81.0	85.1	86.4	84.1
Romania	68.2	74.8	76.3	73.2	75.3	80.0	81.4	78.5
Slovenia	72.6	77.9	79.6	76.2	80.2	83.8	85.6	82.1
Slovakia	69.7	75.3	76.9	73.7	77.8	81.8	83.0	80.5
Finland	75.3	80.2	81.4	79.1	81.9	85.3	86.3	84.4
Sweden	78.1	81.9	82.9	81.0	82.4	85.4	86.4	84.6
UK	76.4	81.0	82.9	80.0	80.9	85.0	86.8	84.0
EU-27	74.9	79.6	81.0	78.5	81.2	85.1	86.3	84.2

Source: Eurostat (2006).

Table B3: Net migration assumptions in 2030 of Eurostat long-term population projections for the baseline, low population and high population variants (000s)

	2004	2030		
		Baseline	High	Low
Belgium	23.7	18.5	25.8	9.0
Bulgaria	-15.9	1.7	13.4	-8.0
Czech Republic	4.3	21.6	42.4	4.4
Denmark	7.8	6.6	10.9	3.5
Germany	210.6	181.0	309.6	88.4
Estonia	0.8	1.8	4.4	-0.3
Ireland	16.4	12.9	19.4	5.5
Spain	507.5	105.3	142.1	57.5
Greece	42.9	34.8	45.3	18.3
France	63.9	58.9	104.7	48.6
Italy	330.0	113.8	154.3	82.8
Cyprus	6.1	4.6	8.0	2.0
Latvia	-2.1	3.0	7.2	-0.5
Lithuania	-5.6	4.6	11.0	-0.8
Luxembourg	2.9	2.8	3.4	1.8
Hungary	14.8	21.2	41.3	4.3
Malta	2.6	2.4	4.1	1.1
Netherlands	21.0	31.6	51.1	18.2
Austria	25.0	19.1	27.9	8.0
Poland	-27.9	35.9	109.6	-25.6
Portugal	41.8	15.0	31.6	0.6
Romania	0.0	0.0	0.0	0.0
Slovenia	6.1	7.0	12.5	2.7
Slovakia	-2.3	5.1	15.4	-3.6
Finland	6.3	6.0	9.1	4.4
Sweden	28.2	21.8	26.0	11.0
UK	139.5	99.2	164.9	40.2
EU-27	1 448.1	836.4	1 395.2	373.6

Source: Eurostat (2006).

*Table B4: Assumptions of the medium population variant of the United Nations 2006 revision of world population prospects in 2030**

	Total fertility rate		Life expectancy				Net migration (000s)		Total population (million)	
			Males		Females					
	2005	2030	2005	2030	2005	2030	2005	2030	2005	2030
Australia	1.76	1.85	77.9	82.0	82.9	85.9	119	100	20.3	25.3
Brazil	2.35	1.92	67.3	73.1	74.9	80.1	-46	-38	186.8	236.5
Canada	1.52	1.65	77.3	81.0	82.3	85.3	208	200	32.3	39.1
China	1.70	1.85	70.5	74.8	73.7	78.6	-380	-320	1 313.0	1 458.4
India	3.11	1.97	61.7	69.3	64.2	73.6	-270	-240	1 134.4	1 505.7
Japan	1.29	1.40	78.3	81.5	85.2	88.9	54	54	127.9	118.3
Russian Federation	1.30	1.51	58.5	64.0	71.8	75.3	183	50	144.0	123.9
South Korea	1.24	1.34	73.5	77.8	80.6	85.0	-16	-6	47.9	48.4
Turkey	2.23	1.86	68.5	73.2	73.3	78.0	-6	-10	73.0	92.5
USA	2.04	1.85	74.7	77.9	80.0	83.3	1 299	1 100	299.8	366.2
EU*	1.48	1.59	75.1	79.6	81.3	85.1	1 237	836	487.9	494.8

* EU: assumption of the Eurostat baseline variant in 2005 and 2030
Source: United Nations (2007); Eurostat (2006).

Table B5: Assumptions on the distribution of VET graduates by field of education (science, mathematics and computing/engineering, manufacturing and construction*), ISCED 3, starting value in 2005** and target value in 2025*** (share)

	Males				Females			
	Science		Manufacturing		Science		Manufacturing	
	2005	2025	2005	2025	2005	2025	2005	2025
Belgium	0.0483	0.1183	0.4073	0.3236	0.0082	0.0085	0.0311	0.0266
Bulgaria	0.0082	0.0208	0.7056	0.6332	0.0110	0.0177	0.4610	0.4435
Czech Republic	0.0000	–	0.7046	0.6978	0.0000	–	0.1539	0.1388
Denmark	0.2180	–	0.3833	–	0.2292	–	0.0423	–
Germany	0.0595	0.1287	0.4776	0.4050	0.0135	0.0298	0.0717	0.0506
Estonia	0.0596	0.1272	0.8476	0.7643	0.0473	0.1158	0.4921	0.4567
Ireland	:		:		:		:	
Greece	0.1752	–	0.7009	–	0.1709	–	0.0564	–
Spain	0.0005	–	0.6052	–	0.0000	–	0.0665	–
France	:		:		:		:	
Italy	0.0000	–	0.4561		0.0000	–	0.1316	–
Cyprus	0.0000	–	0.7580	0.6241	0.0000	–	0.1792	0.1103
Latvia	0.0592	0.1155	0.6479	0.5999	0.0152	0.0323	0.1878	0.1628
Lithuania	0.0000	–	0.7255	0.6338	0.0000	–	0.3163	0.2849
Luxembourg	0.0537	–	0.5255	–	0.0039	–	0.0563	–
Hungary	0.0134	–	0.6948	–	0.0115	–	0.2234	–
Malta	:		:		:		:	
Netherlands	0.1291	0.2993	0.4105	0.2498	0.0100	0.0139	0.0218	0.0183
Austria	0.0045	–	0.0317	–	0.0010	–	0.0140	–
Poland	0.0051	0.0137	0.6831	0.6236	0.0075	0.0256	0.1622	0.1550
Portugal	:		:		:		:	
Romania	0.0000	–	0.5553	–	0.0000	–	0.4693	–
Slovenia	0.0286	0.0440	0.5438	0.4856	0.0014	0.0015	0.0909	0.0814
Slovakia	0.0343	0.0202	0.6168	0.6256	0.0484	0.0472	0.1265	0.1233
Finland	0.0651	0.1668	0.6022	0.5579	0.0437	0.0991	0.0890	0.0817
Sweden	0.0003	–	0.6368	0.6368	0.0011	–	0.0697	–
UK	:		:		:		:	

* Distribution within all other fields of education remains unchanged

** Starting value in 2005 is average of observed values in 2002-04 (Source: Eurostat)

*** Target value is based on extrapolation of linear trend in the observed data in the period 1998-2004

– No trend (target value = starting value)

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Table B6: Assumptions on the distribution of VET graduates by field of education (science, mathematics and computing/engineering, manufacturing and construction*), ISCED 4, starting value in 2005** and target value in 2025*** (share)

	Males				Females			
	Science		Manufacturing		Science		Manufacturing	
	2005	2025	2005	2025	2005	2025	2005	2025
Belgium	0.0258	0.0222	0.4793	0.4611	0.0037	0.0038	0.0442	0.0457
Bulgaria	0.0000	–	0.0314	–	0.0000	–	0.0269	0.0265
Czech Republic	0.0000	–	0.2371	–	0.0000	–	0.0241	–
Denmark	0.0243	–	0.9757	–	0.3389	–	0.6611	–
Germany	0.0547	0.1299	0.5544	0.4853	0.0142	0.0355	0.0555	0.0241
Estonia	0.1240	0.1070	0.4238	0.4577	0.0545	0.0475	0.1015	0.0885
Ireland	0.0219	–	0.5606	–	0.0214	–	0.0062	–
Greece	0.3183	–	0.2685	–	0.2005	–	0.0359	–
Spain	0.0511	–	0.5818	–	0.0390	–	0.2073	–
France	0.1100	–	0.0000	–	0.0292	–	0.0000	–
Italy	:		:		:		:	
Cyprus	:		:		:		:	
Latvia	0.0278	0.0757	0.3933	0.3739	0.0093	0.0173	0.0836	0.0829
Lithuania	0.0000	–	0.3626	0.3893	0.0000	–	0.1588	0.0794
Luxembourg	0.0000	–	0.7538	–	0.0000	–	0.0172	–
Hungary	0.1889	–	0.3765	–	0.0893	–	0.0568	–
Malta	0.0000	–	0.1699	–	0.0000	–	0.0000	–
Netherlands	0.0236	–	0.6278	–	0.0027	–	0.0194	–
Austria	0.0473	–	0.5287	–	0.0028	–	0.0539	–
Poland	0.3429	0.2635	0.0548	0.0421	0.0871	–	0.0251	–
Portugal	:		:		:		:	
Romania	0.0789	0.1153	0.3403	0.2907	0.0238	0.0162	0.0499	0.0339
Slovenia	0.0000	–	0.8676	–	0.0000	–	0.1545	–
Slovakia	0.0220	–	0.0670	–	0.0177	–	0.0269	0.0169
Finland	0.0197	0.0193	0.2505	0.2446	0.0077	–	0.0328	–
Sweden	0.0318	–	0.4538	–	0.0163	–	0.0569	–
UK	:		:		:		:	

* Distribution within all other fields of education remains unchanged

** Starting value in 2005 is average of observed values in 2002-04 (Source: Eurostat)

*** Target value is based on extrapolation of linear trend in the observed data in the period 1998-2004

– No trend (target value = starting value)

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Table B7: Assumptions on the distribution of VET graduates by field of education (science, mathematics and computing/engineering, manufacturing and construction*), ISCED 5B, starting value in 2005** and target value in 2025*** (share)

	Males				Females			
	Science		Manufacturing		Science		Manufacturing	
	2005	2025	2005	2025	2005	2025	2005	2025
Belgium	0.1463	0.2248	0.1809	0.1119	0.0200	0.0307	0.0239	0.0217
Bulgaria	0.0000	-	0.4302	-	0.0000	-	0.1199	-
Czech Republic	0.1527	0.2276	0.1295	0.0709	0.0304	0.0302	0.0203	0.0177
Denmark	0.1885	-	0.1113	-	0.0505	-	0.1386	-
Germany	0.0181	0.0499	0.4235	0.4162	0.0017	0.0044	0.0182	0.0233
Estonia	0.1404	-	0.1789	-	0.0230	-	0.0272	-
Ireland	0.1735	0.1572	0.3890	0.4410	0.1366	0.1337	0.0412	0.0404
Greece	0.0337	-	0.3999	-	0.0178	-	0.1386	-
Spain	0.2179	0.2156	0.3829	0.3788	0.0606	0.0606	0.0703	0.0703
France	0.0961	-	0.4875	-	0.0230	-	0.0780	-
Italy	:		:		:		:	
Cyprus	0.1244	0.2291	0.0846	0.0744	0.0320	0.0481	0.0182	0.0179
Latvia	0.0618	0.1175	0.1904	0.1700	0.0120	-	0.0146	-
Lithuania	0.0487	0.0975	0.3991	0.3787	0.0065	0.0046	0.0707	0.0500
Luxembourg	0.1484	-	0.3419	-	0.0046	-	0.0046	-
Hungary	0.1007	0.1705	0.3529	0.3029	0.0466	0.0730	0.0452	0.0439
Malta	0.0455	-	0.0341	-	0.0165	-	0.0000	-
Netherlands	0.1523	-	0.0700	-	0.0136	-	0.0000	-
Austria	0.0000	-	0.6359	-	0.0000	-	0.1040	-
Poland	:		:		:		:	
Portugal	0.0954	-	0.2485	-	0.0351	-	0.0947	-
Romania	0.0728	0.1054	0.4949	0.4374	0.0221	0.0200	0.1174	0.1063
Slovenia	0.0263	0.0590	0.3645	0.3330	0.0037	0.0072	0.0534	0.0474
Slovakia	0.0283	0.0780	0.0273	0.0265	0.0000	-	0.0112	0.0099
Finland	0.0022	-	0.1435	-	0.0301	-	0.0663	-
Sweden	0.2230	0.2136	0.3059	0.2930	0.0644	0.0619	0.0886	0.0851
UK	0.2049	0.1982	0.1467	0.1125	0.0514	0.0387	0.0142	0.0139

* Distribution within all other fields of education remains unchanged

** Starting value in 2005 is average of observed values in 2002-04 (Source: Eurostat)

*** Target value is based on extrapolation of linear trend in the observed data in the period 1998-2004

- No trend (target value = starting value)

: No data available

Table B8: Employment rates in age group 15-24, EU-27, 2005-50, labour force baseline scenario (rates)

	2005	2010	2015	2020	2025	2030	2050
EU-27*	0.374	0.392	0.401	0.393	0.397	0.399	0.407
Belgium	0.286	0.292	0.308	0.300	0.302	0.297	0.303
Bulgaria*	0.256	0.281	0.286	0.260	0.282	0.289	0.296
Czech Republic	0.290	0.298	0.321	0.270	0.275	0.282	0.293
Denmark	0.606	0.625	0.640	0.642	0.643	0.640	0.640
Germany	0.452	0.475	0.473	0.474	0.468	0.466	0.474
Ireland	0.497	0.495	0.471	0.462	0.470	0.484	0.470
Estonia	0.308	0.358	0.350	0.291	0.297	0.308	0.313
Greece	0.267	0.246	0.259	0.248	0.248	0.259	0.258
Spain	0.350	0.330	0.334	0.320	0.333	0.350	0.333
France	0.317	0.325	0.330	0.325	0.338	0.334	0.329
Italy	0.270	0.276	0.287	0.278	0.286	0.292	0.284
Cyprus	0.413	0.413	0.431	0.420	0.390	0.383	0.413
Latvia	0.344	0.400	0.408	0.324	0.325	0.340	0.354
Lithuania	0.236	0.274	0.296	0.269	0.244	0.244	0.264
Luxembourg	0.239	0.242	0.251	0.257	0.255	0.249	0.253
Hungary	0.270	0.278	0.290	0.271	0.264	0.268	0.275
Malta	0.470	0.476	0.493	0.472	0.455	0.467	0.474
Netherlands	0.686	0.694	0.697	0.697	0.702	0.699	0.698
Austria	0.531	0.533	0.543	0.537	0.532	0.531	0.536
Poland	0.238	0.253	0.261	0.264	0.283	0.278	0.305
Portugal	0.397	0.382	0.371	0.364	0.371	0.380	0.373
Romania*	0.247	0.291	0.276	0.267	0.280	0.288	0.297
Slovenia	0.271	0.267	0.250	0.237	0.236	0.235	0.249
Slovakia	0.287	0.284	0.297	0.294	0.315	0.317	0.335
Finland	0.420	0.432	0.450	0.439	0.433	0.434	0.439
Sweden	0.433	0.463	0.494	0.456	0.456	0.463	0.468
UK	0.567	0.582	0.583	0.573	0.568	0.570	0.573

* Bulgaria and Romania: calculated using weighted average of Carone's (2005) NMS-10 five-year age group employment rates
Source: NIDI calculations based on Carone (2005).

Students, ISCED 3 Vocational	Males	15-19	5011.8	4688.5	4305.0	4217.7	4158.4	4115.0	3702.8	100	94	86	84	83	82	74
		20-24	713.1	728.0	677.5	645.0	616.9	609.8	569.8	100	102	95	90	87	86	80
		Total	5724.9	5416.5	4982.5	4862.7	4775.3	4724.8	4272.6	100	95	87	85	83	83	75
	Females	15-19	4251.4	3998.8	3686.9	3613.2	3550.7	3511.7	3170.0	100	94	87	85	84	83	75
		20-24	591.0	605.5	578.2	547.8	525.4	519.8	490.8	100	102	98	93	89	88	83
		Total	4842.4	4604.3	4265.0	4161.1	4076.0	4031.5	3660.8	100	95	88	86	84	83	76
	Total	15-19	9263.2	8687.4	7991.9	7831.0	7709.1	7626.7	6872.8	100	94	86	85	83	82	74
		20-24	1304.1	1333.5	1255.7	1192.8	1142.3	1129.6	1060.6	100	102	96	91	88	87	81
		Total	10567.4	10020.9	9247.6	9023.8	8851.4	8756.3	7933.4	100	95	88	85	84	83	75
Students, ISCED 4 Total	Males	15-19	194.3	195.8	166.4	162.8	157.4	157.1	139.5	100	101	86	84	81	81	72
		20-24	345.4	337.6	294.5	275.8	261.4	261.2	233.4	100	98	85	80	76	76	68
		Total	539.7	533.4	460.9	438.6	418.7	418.2	372.9	100	99	85	81	78	77	69
	Females	15-19	213.9	213.2	182.7	177.2	170.2	169.8	150.3	100	100	85	83	80	79	70
		20-24	344.5	337.7	291.1	269.9	253.4	251.9	223.9	100	98	85	78	74	73	65
		Total	558.4	551.0	473.8	447.0	423.6	421.7	374.2	100	99	85	80	76	76	67
	Total	15-19	408.2	409.1	349.2	340.0	327.6	326.8	289.8	100	100	86	83	80	80	71
		20-24	689.9	675.3	585.6	545.6	514.7	513.1	457.3	100	98	85	79	75	74	66
		Total	1098.1	1084.4	934.7	885.6	842.3	839.9	747.0	100	99	85	81	77	76	68
Students, ISCED 4 Vocational	Males	15-19	175.7	176.3	150.3	146.6	142.1	141.8	125.9	100	100	86	83	81	81	72
		20-24	311.9	303.0	263.8	245.9	233.2	233.4	208.0	100	97	85	79	75	75	67
		Total	487.6	479.3	414.1	392.5	375.3	375.2	334.0	100	98	85	81	77	77	68
	Females	15-19	194.1	192.9	166.0	160.3	154.3	153.8	136.2	100	99	85	83	79	79	70
		20-24	310.7	303.2	260.6	240.4	225.4	224.3	198.8	100	98	84	77	73	72	64
		Total	504.8	496.1	426.5	400.7	379.7	378.2	335.1	100	98	84	79	75	75	66
	Total	15-19	369.8	369.2	316.3	306.9	296.4	295.7	262.2	100	100	86	83	80	80	71
		20-24	622.6	606.2	524.3	486.3	458.5	457.7	406.9	100	97	84	78	74	74	65
		Total	992.4	975.4	840.6	793.2	755.0	753.4	669.0	100	98	85	80	76	76	67
Students, ISCED 5 Total	Males	15-19	1133.6	1101.2	1003.0	1002.1	1003.6	987.2	878.6	100	97	88	88	89	87	78
		20-24	3954.3	3800.7	3551.4	3287.1	3264.0	3242.3	2892.6	100	96	90	83	83	82	73
		Total	5087.8	4901.9	4554.4	4289.2	4267.6	4229.6	3771.3	100	96	90	84	84	83	74
	Females	15-19	1603.5	1554.1	1411.8	1410.4	1399.8	1376.0	1218.0	100	97	88	88	87	86	76
		20-24	4738.9	4522.9	4210.6	3900.6	3870.0	3831.7	3396.2	100	95	89	82	82	81	72
		Total	6342.4	6077.0	5622.4	5310.9	5269.8	5207.7	4614.3	100	96	89	84	83	82	73
	Total	15-19	2737.1	2655.3	2414.8	2412.4	2403.4	2363.2	2096.7	100	97	88	88	88	86	77
		20-24	8693.2	8323.6	7762.1	7187.7	7134.1	7074.1	6288.9	100	96	89	83	82	81	72
		Total	11430.3	10978.9	10176.8	9600.2	9537.4	9437.3	8385.5	100	96	89	84	83	83	73
Students, ISCED 5 Vocational	Males	15-19	213.1	208.5	193.8	198.4	197.7	195.4	176.9	100	98	91	93	93	92	83
		20-24	457.6	440.9	414.4	396.9	401.4	400.2	359.7	100	96	91	87	88	87	79
		Total	670.7	649.4	608.2	595.3	599.1	595.6	536.6	100	97	91	89	89	89	80
	Females	15-19	302.6	296.9	272.4	274.6	269.8	266.9	239.9	100	98	90	91	89	88	79
		20-24	583.1	567.2	528.3	506.6	506.4	501.5	452.7	100	97	91	87	87	86	78
		Total	885.7	864.1	800.7	781.2	776.2	768.4	692.7	100	98	90	88	88	87	78
	Total	15-19	515.7	505.4	466.2	473.0	467.5	462.3	416.8	100	98	90	92	91	90	81
		20-24	1040.7	1008.1	942.7	903.4	907.8	901.6	812.4	100	97	91	87	87	87	78
		Total	1556.4	1513.5	1408.9	1376.4	1375.4	1364.0	1229.2	100	97	91	88	88	88	79

Table C2: Projected number of VET graduates, ISCED 3-5, by gender and age group, EU-27, 2005-50, baseline variant/constant education participation/constant graduation rates

			(000s)							2005=100						
		Age group	2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050
Students, ISCED 3 Pre-vocational	Males	15-19	114.5	115.6	108.7	110.4	111.7	105.4	89.0	100	101	95	96	98	92	78
		20-24	13.6	13.0	12.5	12.3	12.7	12.2	9.9	100	96	92	91	93	90	73
		Total	128.1	128.5	121.2	122.7	124.4	117.7	99.0	100	100	95	96	97	92	77
	Females	15-19	86.3	86.5	81.8	84.0	84.5	79.7	67.4	100	100	95	97	98	92	78
		20-24	6.0	5.6	5.4	5.3	5.4	5.3	4.3	100	93	90	88	90	88	71
		Total	92.3	92.1	87.2	89.3	89.9	84.9	71.7	100	100	94	97	97	92	78
	Total	15-19	200.8	202.1	190.5	194.4	196.2	185.1	156.4	100	101	95	97	98	92	78
		20-24	19.6	18.6	17.9	17.6	18.1	17.5	14.2	100	95	91	90	92	89	72
		Total	220.4	220.7	208.4	212.0	214.3	202.6	170.7	100	100	95	96	97	92	77
Students, ISCED 3 Vocational	Males	15-19	1234.1	1163.4	1069.9	1051.1	1034.4	1024.3	931.3	100	94	87	85	84	83	75
		20-24	252.2	251.4	229.9	216.9	206.7	204.3	189.4	100	100	91	86	82	81	75
		Total	1486.3	1414.8	1299.8	1268.1	1241.1	1228.6	1120.8	100	95	87	85	83	83	75
	Females	15-19	1050.7	993.7	918.6	902.9	883.4	873.1	792.4	100	95	87	86	84	83	75
		20-24	171.8	171.2	159.2	151.7	145.2	142.6	132.3	100	100	93	88	84	83	77
		Total	1222.5	1164.9	1077.8	1054.6	1028.6	1015.7	924.8	100	95	88	86	84	83	76
	Total	15-19	2284.8	2157.1	1988.5	1954.0	1917.9	1897.4	1723.8	100	94	87	86	84	83	75
		20-24	424.0	422.6	389.1	368.6	351.8	346.9	321.7	100	100	92	87	83	82	76
		Total	2708.8	2579.8	2377.6	2322.6	2269.7	2244.3	2045.5	100	95	88	86	84	83	76
Students, ISCED 4 Vocational	Males	15-19	59.9	60.9	52.6	51.4	50.0	49.9	44.7	100	102	88	86	84	83	75
		20-24	105.8	103.3	89.8	82.5	77.8	77.5	69.2	100	98	85	78	74	73	65
		Total	165.7	164.3	142.4	134.0	127.8	127.4	113.8	100	99	86	81	77	77	69
	Females	15-19	63.5	64.2	55.8	53.8	52.0	51.8	46.2	100	101	88	85	82	82	73
		20-24	119.6	115.1	98.5	89.2	83.6	83.3	73.4	100	96	82	75	70	70	61
		Total	183.1	179.3	154.3	142.9	135.6	135.1	119.7	100	98	84	78	74	74	65
	Total	15-19	123.4	125.1	108.4	105.2	102.1	101.7	90.9	100	101	88	85	83	82	74
		20-24	225.4	218.4	188.3	171.7	161.4	160.8	142.6	100	97	84	76	72	71	63
		Total	348.8	343.5	296.7	276.9	263.5	262.5	233.5	100	98	85	79	76	75	67
Students, ISCED 5B Vocational	Males	15-19	51.5	50.6	47.6	49.3	49.1	48.3	44.2	100	98	93	96	95	94	86
		20-24	110.6	107.9	102.0	98.8	100.7	100.1	90.4	100	98	92	89	91	90	82
		Total	162.1	158.5	149.6	148.1	149.8	148.4	134.6	100	98	92	91	92	92	83
	Females	15-19	65.2	63.6	59.5	61.0	60.3	59.4	53.8	100	98	91	94	93	91	83
		20-24	156.1	152.2	142.4	136.9	138.3	136.8	123.7	100	98	91	88	89	88	79
		Total	221.2	215.8	201.9	197.8	198.6	196.2	177.6	100	98	91	89	90	89	80
	Total	15-19	116.6	114.2	107.1	110.3	109.4	107.6	98.1	100	98	92	95	94	90	84
		20-24	266.7	260.1	244.3	235.7	239.0	236.9	214.1	100	98	92	88	90	89	80
		Total	383.3	374.3	351.5	346.0	348.4	344.5	312.2	100	98	92	90	91	90	81

Table C3: Projected number of VET graduates, ISCED 3-5, by gender and field of education, EU-27, 2005-20, baseline variant/constant education participation/constant graduation rates

		(000s)							2005=100							
		2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050	
Students , ISCED 3 Prevocational	Males	Education	4.1	4.5	4.5	4.6	4.6	4.6	4.5	100	111	109	112	113	113	109
		Humanities	26.8	27.4	25.6	26.1	27.0	26.5	23.1	100	103	96	97	101	99	87
		Business	134.7	125.3	110.5	104.1	98.9	97.7	86.3	100	93	82	77	73	72	64
		Science	34.2	42.3	47.9	54.6	59.6	58.5	55.1	100	124	140	160	174	171	161
		Engineering	507.5	456.9	387.3	359.8	344.5	341.8	294.3	100	90	76	71	68	67	58
		Agriculture	41.6	36.0	30.1	27.7	26.2	25.8	21.9	100	86	72	67	63	62	53
		Health	15.8	17.1	16.8	17.5	18.1	17.9	16.2	100	108	107	111	114	113	103
		Services	98.6	94.3	86.0	85.3	86.3	85.5	75.0	100	96	87	87	88	87	76
		Unknown	623.0	611.1	591.1	588.4	575.8	570.3	544.4	100	98	95	94	92	92	87
		Total	1486.3	1414.8	1299.8	1268.1	1241.1	1228.6	1120.8	100	95	87	85	83	83	75
Students , ISCED 3 Prevocational	Females	Education	6.8	9.0	10.5	12.5	13.9	13.6	12.8	100	133	155	185	205	202	190
		Humanities	50.4	51.4	47.6	48.1	49.5	48.6	42.3	100	102	94	96	98	96	84
		Business	277.2	255.4	224.6	212.4	203.9	201.5	174.3	100	92	81	77	74	73	63
		Science	11.2	12.6	13.3	14.1	14.9	14.6	13.3	100	112	119	125	132	130	118
		Engineering	101.5	85.6	71.5	66.3	64.0	63.0	51.5	100	84	70	65	63	62	51
		Agriculture	24.4	21.7	18.3	17.0	16.5	16.4	13.9	100	89	75	70	68	67	57
		Health	110.1	111.2	105.0	104.9	102.4	100.4	92.5	100	101	95	95	93	91	84
		Services	120.0	110.8	96.3	91.3	88.0	87.1	76.5	100	92	80	76	73	73	64
		Unknown	521.0	507.4	490.7	488.0	475.5	470.5	447.7	100	97	94	94	91	90	86
		Total	1222.6	1165.0	1077.8	1054.6	1028.6	1015.7	924.8	100	95	88	86	84	83	76
Students , ISCED 3 Prevocational	Total	Education	10.9	13.5	14.9	17.1	18.5	18.3	17.3	100	125	137	157	170	168	159
		Humanities	77.2	78.9	73.1	74.2	76.5	75.1	65.4	100	102	95	96	99	97	85
		Business	411.9	380.7	335.1	316.5	302.8	299.2	260.6	100	92	81	77	74	73	63
		Science	45.4	55.0	61.2	68.7	74.4	73.2	68.4	100	121	135	151	164	161	151
		Engineering	609.0	542.5	458.8	426.1	408.6	404.8	345.7	100	89	75	70	67	66	57
		Agriculture	66.1	57.7	48.4	44.7	42.8	42.2	35.8	100	87	73	68	65	64	54
		Health	125.9	128.3	121.8	122.4	120.5	118.3	108.8	100	102	97	97	96	94	86
		Services	218.6	205.0	182.3	176.7	174.3	172.6	151.4	100	94	83	81	80	79	69
		Unknown	1144.0	1118.4	1081.8	1076.4	1051.3	1040.8	992.1	100	98	95	94	92	91	87
		Total	2709.0	2579.9	2377.6	2322.7	2269.7	2244.3	2045.5	100	95	88	86	84	83	76
Students , ISCED 4 Vocational	Males	Education	0.1	0.2	0.1	0.1	0.1	0.1	0.1	100	102	92	86	84	84	76
		Humanities	6.7	6.7	5.9	5.6	5.6	5.6	5.0	100	100	88	83	83	84	75
		Business	30.7	30.3	25.7	23.9	22.3	22.2	19.9	100	99	84	78	73	72	65
		Science	19.3	18.8	16.8	15.9	15.6	15.6	14.0	100	97	87	82	81	81	73
		Engineering	64.4	64.6	55.3	52.4	49.1	48.8	43.9	100	100	86	81	76	76	68
		Agriculture	6.1	5.9	5.1	4.9	4.8	4.8	4.2	100	96	83	80	78	78	69
		Health	6.7	6.9	6.0	5.6	5.5	5.5	4.9	100	102	90	84	82	82	72
		Services	21.5	21.2	18.8	17.2	16.7	16.7	15.1	100	99	87	80	78	78	70
		Unknown	10.1	9.8	8.7	8.3	8.2	8.1	6.8	100	97	87	82	81	80	67
		Total	165.7	164.3	142.4	134.0	127.8	127.4	113.8	100	99	86	81	77	77	69
Students , ISCED 4 Vocational	Females	Education	2.4	2.6	2.5	2.3	2.3	2.1	100	106	101	95	95	93	84	
		Humanities	10.4	10.2	9.1	8.8	9.0	9.0	7.9	100	98	88	85	86	86	76
		Business	70.6	69.1	59.8	55.7	52.4	52.1	46.8	100	98	85	79	74	74	66
		Science	7.8	7.4	6.6	6.1	6.0	6.0	5.3	100	95	85	78	77	77	68
		Engineering	7.9	7.4	5.8	4.9	4.3	4.3	3.8	100	93	74	63	54	54	48
		Agriculture	2.0	2.0	1.7	1.7	1.6	1.6	1.4	100	100	86	82	78	77	69
		Health	39.4	39.9	33.3	31.2	29.7	29.7	25.9	100	101	85	79	75	75	66
		Services	30.8	29.4	25.0	22.1	20.4	20.3	18.3	100	95	81	72	66	66	59
		Unknown	11.8	11.4	10.5	10.1	10.1	9.9	8.3	100	96	89	86	85	84	70
		Total	183.1	179.3	154.3	142.9	135.6	135.1	119.7	100	98	84	78	74	74	65
Students , ISCED 4 Vocational	Total	Education	2.6	2.8	2.6	2.5	2.4	2.4	2.2	100	106	101	95	94	93	84
		Humanities	17.1	16.9	15.0	14.4	14.6	14.6	12.9	100	98	88	84	85	85	76
		Business	101.3	99.4	85.5	79.6	74.7	74.3	66.6	100	98	84	79	74	73	66
		Science	27.1	26.1	23.4	22.0	21.6	21.5	19.3	100	96	86	81	80	80	71
		Engineering	72.2	72.0	61.1	57.4	53.4	53.1	47.7	100	100	85	79	74	73	66
		Agriculture	8.1	7.9	6.8	6.5	6.4	6.4	5.6	100	97	83	80	78	78	69
		Health	46.1	46.7	39.3	36.9	35.2	35.2	30.8	100	101	85	80	76	76	67
		Services	52.3	50.6	43.8	39.3	37.1	37.0	33.4	100	97	84	75	71	71	64
		Unknown	21.9	21.1	19.3	18.4	18.2	18.0	15.0	100	97	88	84	83	82	69
		Total	348.8	343.5	296.7	276.9	263.5	262.5	233.5	100	98	85	79	76	75	67

Students, ISCED 5B Vocational	Males	Education	5.8	6.0	5.9	5.6	5.6	5.5	5.2	100	103	101	96	96	96	90
		Humanities	7.9	7.8	7.5	7.3	7.5	7.5	6.6	100	99	95	92	95	95	84
		Business	38.0	37.3	35.1	34.7	34.7	34.3	31.8	100	98	92	91	91	90	84
		Science	21.6	21.4	20.6	20.6	21.3	21.2	18.9	100	99	95	95	99	98	87
		Engineering	60.6	58.4	54.4	54.4	54.8	54.1	49.0	100	96	90	90	90	89	81
		Agriculture	2.5	2.4	2.2	2.0	2.0	2.0	1.7	100	96	87	81	78	78	69
		Health	13.9	14.1	13.6	13.5	13.7	13.6	12.6	100	101	97	97	99	98	90
		Services	10.9	10.3	9.6	9.3	9.6	9.5	8.2	100	95	88	86	88	88	76
		Unknown	0.9	0.9	0.8	0.7	0.6	0.6	0.6	100	101	87	77	71	71	65
		Total	162.1	158.6	149.6	148.1	149.8	148.4	134.6	100	98	92	91	92	92	83
	Females	Education	21.9	21.6	20.0	18.8	18.7	18.6	16.7	100	98	91	86	86	85	76
		Humanities	9.9	9.7	9.3	9.2	9.4	9.4	8.2	100	97	94	92	95	95	83
		Business	82.0	80.1	75.0	74.5	75.2	73.9	67.5	100	98	91	91	92	90	82
		Science	6.8	6.6	6.2	6.1	6.2	6.2	5.4	100	96	91	89	91	90	79
		Engineering	13.2	12.7	11.8	11.8	11.9	11.7	10.5	100	96	89	89	90	89	79
		Agriculture	1.6	1.5	1.4	1.3	1.2	1.2	1.1	100	95	86	79	76	77	68
		Health	68.1	66.8	62.6	60.8	60.3	59.5	54.6	100	98	92	89	88	87	80
		Services	16.6	15.7	14.6	14.5	14.9	14.8	12.8	100	95	88	87	90	89	77
		Unknown	1.0	1.1	1.0	0.9	0.9	0.9	0.8	100	104	95	88	84	84	78
		Total	221.3	215.8	201.9	197.9	198.6	196.2	177.6	100	98	91	89	90	89	80
	Total	Education	27.7	27.5	25.9	24.4	24.3	24.2	22.0	100	99	93	88	88	87	79
		Humanities	17.8	17.4	16.8	16.4	16.9	16.9	14.8	100	98	94	92	95	95	83
		Business	120.1	117.5	110.1	109.2	109.9	108.2	99.3	100	98	92	91	92	90	83
		Science	28.4	27.9	26.8	26.7	27.5	27.4	24.3	100	98	94	94	97	96	85
		Engineering	73.8	71.2	66.2	66.2	66.7	65.8	59.4	100	96	90	90	90	89	81
		Agriculture	4.1	4.0	3.6	3.3	3.2	3.2	2.8	100	96	86	80	77	78	69
		Health	82.0	80.9	76.2	74.3	74.0	73.1	67.2	100	99	93	91	90	89	82
		Services	27.5	26.0	24.2	23.8	24.5	24.4	21.0	100	95	88	87	89	89	76
		Unknown	1.9	2.0	1.8	1.6	1.5	1.5	1.4	100	102	91	82	78	78	72
		Total	383.4	374.4	351.5	346.0	348.4	344.5	312.2	100	98	92	90	91	90	81

Figure C1: Projected number of students in prevocational and vocational streams by ISCED level, EU-27, 2005-50, baseline variant/constant education participation

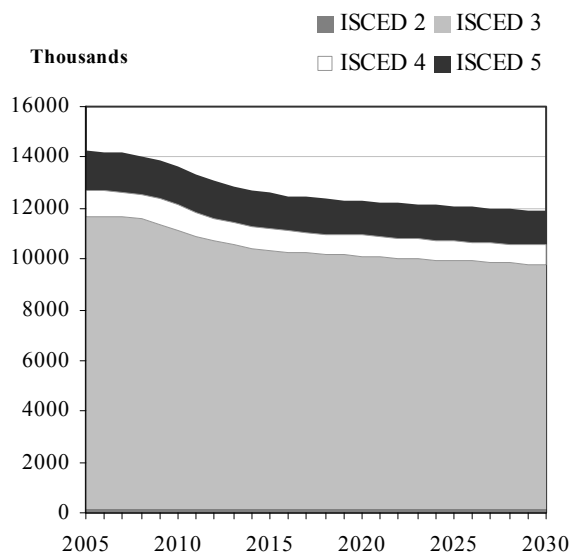


Figure C2: Index of the projected number of students in prevocational and vocational streams, by ISCED level, EU-27, 2005-50, baseline variant/constant education participation

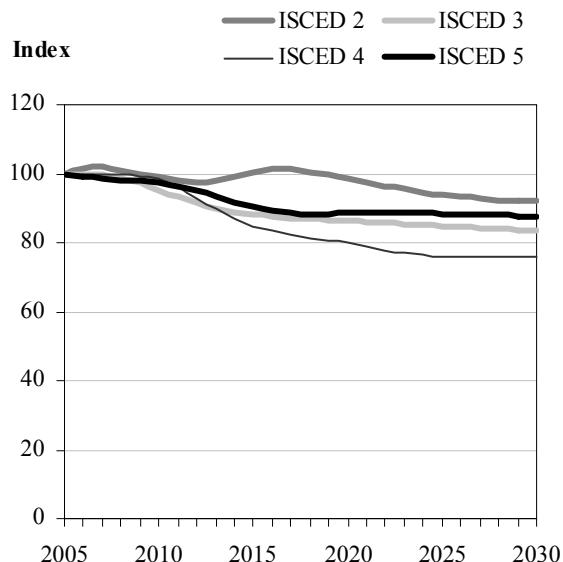


Figure C3: Projected number of VET graduates by ISCED level, EU-27, 2005-50, baseline variant/constant education participation/constant graduation rates

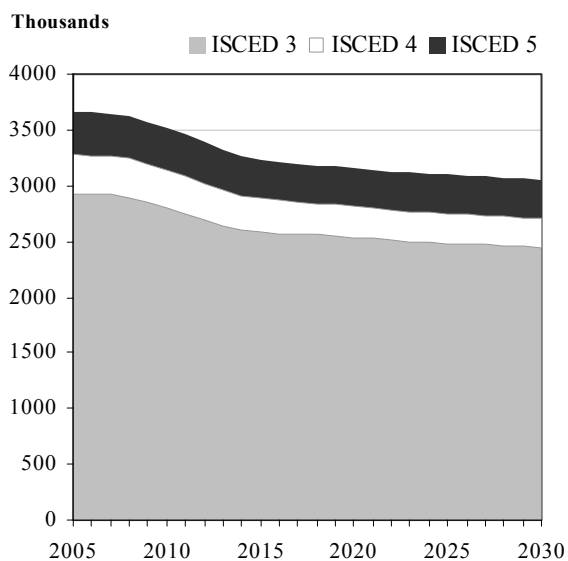


Figure C4: Projected number of VET graduates, ISCED 3, by field of education, EU-27, 2005-50, baseline variant/constant education participation/constant graduation rates

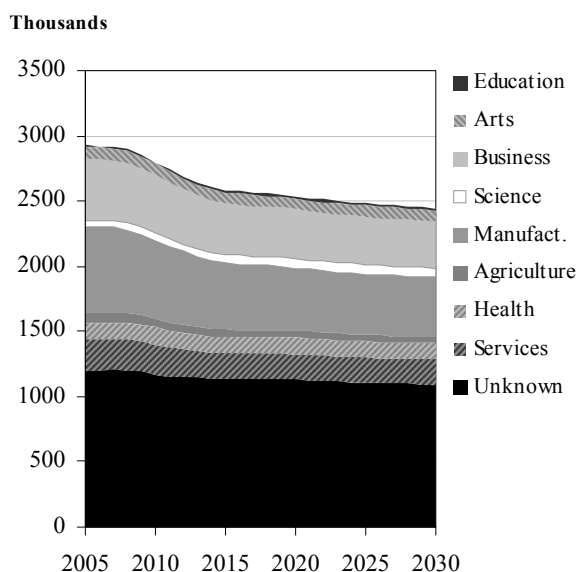


Table C4: Projected population and number of students at ISCED 2-5 by gender, age group and type of education, EU-27, 2005-20, high population variant/constant education participation

			(000s)							2005=100						
		Age group	2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050
Population	Males	15-19	15557.1	14707.4	13656.2	13640.1	14530.8	15159.3	15058.6	100	95	88	88	93	97	97
		20-24	16265.5	15889.0	15008.2	13972.1	13991.2	14922.5	15375.1	100	98	92	86	86	92	95
		Total	31822.7	30596.3	28664.4	27612.3	28522.1	30081.8	30433.7	100	96	90	87	90	95	96
	Females	15-19	14814.8	13984.9	12971.6	12944.8	13723.3	14307.2	14182.2	100	94	88	87	93	97	96
		20-24	15724.9	15274.8	14405.8	13403.5	13422.6	14258.0	14653.8	100	97	92	85	85	91	93
		Total	30539.8	29259.7	27377.4	26348.3	27145.9	28565.1	28836.0	100	96	90	86	89	94	94
	Total	15-19	30372.0	28692.3	26627.8	26585.0	28254.1	29466.5	29240.8	100	94	88	88	93	97	96
		20-24	31990.5	31163.8	29414.0	27375.6	27413.9	29180.5	30028.9	100	97	92	86	86	91	94
		Total	62362.4	59856.0	56041.9	53960.6	55668.0	58647.0	59269.7	100	96	90	87	89	94	95
Students, ISCED 2 Total	Males	15-19	2506.0	2288.7	2194.3	2234.3	2386.0	2468.2	2449.0	100	91	88	89	95	98	98
		20-24	41.3	40.5	37.8	35.6	35.8	38.2	39.2	100	98	92	86	87	93	95
		Total	2547.3	2329.1	2232.1	2269.8	2421.8	2506.4	2488.1	100	91	88	89	95	98	98
	Females	15-19	2142.3	1951.3	1871.7	1901.0	2023.5	2091.1	2071.0	100	91	87	89	94	98	97
		20-24	37.3	36.3	34.0	31.8	32.0	34.0	34.8	100	97	91	85	86	91	93
		Total	2179.6	1987.6	1905.7	1932.8	2055.5	2125.1	2105.8	100	91	87	89	94	98	97
	Total	15-19	4648.3	4239.9	4066.0	4135.2	0.0	4559.3	4520.0	100	91	87	89	0	98	97
		20-24	78.6	76.8	71.8	67.4	67.8	72.3	74.0	100	98	91	86	86	92	94
		Total	4726.9	4316.7	4137.8	4202.6	67.8	4631.5	4594.0	100	91	88	89	1	98	97
Students, ISCED 2 Prevocational	Males	15-19	73.9	67.6	64.7	65.7	70.2	72.7	72.1	100	92	88	89	95	98	98
		20-24	1.6	1.6	1.5	1.4	1.4	1.5	1.6	100	98	91	86	87	93	95
		Total	75.5	69.2	66.2	67.1	71.6	74.2	73.7	100	92	88	89	95	98	98
	Females	15-19	49.4	45.1	43.1	43.7	46.6	48.1	47.7	100	91	87	88	94	98	97
		20-24	1.0	1.0	0.9	0.9	0.9	0.9	0.9	100	97	91	85	86	91	93
		Total	50.4	46.0	44.0	44.6	47.4	49.1	48.6	100	91	87	88	94	97	96
	Total	15-19	123.3	112.7	107.8	109.3	116.8	120.8	119.8	100	91	87	89	95	98	97
		20-24	2.6	2.6	2.4	2.3	2.3	2.4	2.5	100	98	91	86	86	92	94
		Total	125.9	115.3	110.2	111.6	119.0	123.3	122.3	100	92	88	89	95	98	97
Students, ISCED 2 Vocational	Males	15-19	23.8	21.9	20.8	21.1	22.6	23.4	23.2	100	92	88	89	95	98	97
		20-24	3.3	3.3	3.1	2.9	2.9	3.1	3.2	100	98	92	86	86	92	95
		Total	27.1	25.1	23.9	24.0	25.4	26.4	26.4	100	93	88	88	94	97	97
	Females	15-19	14.6	13.5	12.8	12.9	13.7	14.2	14.1	100	92	87	88	94	97	96
		20-24	5.3	5.1	4.9	4.5	4.5	4.8	4.9	100	97	92	85	85	90	93
		Total	19.9	18.6	17.6	17.4	18.2	19.0	19.0	100	93	89	87	92	95	95
	Total	15-19	38.4	35.3	33.6	34.0	36.3	37.6	37.3	100	92	88	89	94	98	97
		20-24	8.6	8.4	7.9	7.4	7.4	7.9	8.1	100	97	92	85	86	91	94
		Total	47.0	43.7	41.5	41.4	43.7	45.4	45.4	100	93	88	88	93	97	96
Students, ISCED 3 Total	Males	15-19	8813.1	8296.4	7730.3	7706.6	8248.2	8596.9	8533.3	100	94	88	87	94	98	97
		20-24	1175.8	1154.4	1072.2	1013.9	1023.2	1095.0	1117.0	100	98	91	86	87	93	95
		Total	9989.0	9450.9	8802.5	8720.5	9271.3	9691.9	9650.3	100	95	88	87	93	97	97
	Females	15-19	8636.8	8106.9	7555.5	7528.5	8023.5	8353.8	8273.5	100	94	87	87	93	97	96
		20-24	1052.2	1027.9	956.9	901.2	906.8	966.6	985.8	100	98	91	86	86	92	94
		Total	9688.9	9134.8	8512.5	8429.7	8930.3	9320.4	9259.3	100	94	88	87	92	96	96
	Total	15-19	17449.9	16403.3	15285.9	15235.1	16271.6	16950.7	16806.8	100	94	88	87	93	97	96
		20-24	2228.0	2182.4	2029.1	1915.1	1930.0	2061.6	2102.8	100	98	91	86	87	93	94
		Total	19677.9	18585.7	17315.0	17150.2	18201.6	19012.3	18909.6	100	94	88	87	92	97	96
Students, ISCED 3 Prevocational	Males	15-19	564.0	527.4	494.5	495.1	529.9	551.4	547.2	100	94	88	88	94	98	97
		20-24	26.8	26.4	24.3	23.1	23.5	25.1	25.5	100	98	91	86	88	94	95
		Total	590.8	553.7	518.8	518.2	553.4	576.5	572.7	100	94	88	88	94	98	97
	Females	15-19	356.1	332.2	311.5	311.3	332.0	345.1	341.7	100	93	87	87	93	97	96
		20-24	12.6	12.4	11.4	10.8	10.9	11.7	11.8	100	98	90	86	87	93	94
		Total	368.7	344.6	322.9	322.1	342.9	356.8	353.6	100	93	88	87	93	97	96
	Total	15-19	920.2	859.6	806.0	806.4	861.9	896.5	888.9	100	93	88	88	94	97	97
		20-24	39.4	38.7	35.7	34.0	34.4	36.8	37.3	100	98	91	86	87	93	95
		Total	959.6	898.3	841.7	840.3	896.3	933.2	926.3	100	94	88	88	93	97	97

Students, ISCED 3 Vocational	Males	15-19	5018.1	4725.7	4401.8	4387.5	4695.5	4894.4	4858.3	100	94	88	87	94	98	97
		20-24	714.1	701.1	651.4	615.8	621.2	664.9	678.4	100	98	91	86	87	93	95
		Total	5732.2	5426.8	5053.1	5003.2	5316.6	5559.3	5536.7	100	95	88	87	93	97	97
	Females	15-19	4256.8	4008.1	3736.6	3724.3	3968.8	4131.9	4092.2	100	94	88	87	93	97	96
		20-24	592.1	584.6	545.1	512.6	515.4	549.2	560.6	100	99	92	87	87	93	95
		Total	4848.9	4592.7	4281.7	4236.8	4484.2	4681.1	4652.8	100	95	88	87	92	97	96
	Total	15-19	9274.9	8733.8	8138.4	8111.7	8664.3	9026.3	8950.5	100	94	88	87	93	97	97
		20-24	1306.3	1285.7	1196.4	1128.3	1136.6	1214.1	1239.0	100	98	92	86	87	93	95
		Total	10581.2	10019.5	9334.8	9240.1	9800.8	10240.4	10189.5	100	95	88	87	93	97	96
Students, ISCED 4 Total	Males	15-19	194.6	191.5	171.5	170.2	177.7	187.3	186.8	100	98	88	87	91	96	96
		20-24	345.8	340.2	314.7	298.5	301.6	323.1	329.0	100	98	91	86	87	93	95
		Total	540.4	531.7	486.1	468.7	479.3	510.4	515.8	100	98	90	87	89	94	95
	Females	15-19	214.3	210.0	188.3	187.0	194.4	204.6	203.5	100	98	88	87	91	95	95
		20-24	345.1	338.5	312.6	296.5	299.2	319.5	324.4	100	98	91	86	87	93	94
		Total	559.4	548.5	500.9	483.4	493.6	524.1	528.0	100	98	90	86	88	94	94
	Total	15-19	408.8	401.5	359.7	357.2	372.1	391.9	390.3	100	98	88	87	91	96	95
		20-24	691.0	678.7	627.3	595.0	600.8	642.7	653.4	100	98	91	86	87	93	95
		Total	1099.8	1080.2	987.0	952.1	972.9	1034.5	1043.7	100	98	90	87	88	94	95
Students, ISCED 4 Vocational	Males	15-19	175.9	173.1	155.0	153.9	160.7	169.3	168.9	100	98	88	87	91	96	96
		20-24	312.4	307.3	284.2	269.6	272.4	291.9	297.2	100	98	91	86	87	93	95
		Total	488.3	480.4	439.2	423.5	433.1	461.2	466.0	100	98	90	87	89	94	95
	Females	15-19	194.5	190.5	170.9	169.7	176.5	185.7	184.7	100	98	88	87	91	96	95
		20-24	311.3	305.3	281.9	267.4	269.9	288.2	292.6	100	98	91	86	87	93	94
		Total	505.7	495.8	452.8	437.0	446.4	473.9	477.3	100	98	90	86	88	94	94
	Total	15-19	370.4	363.6	325.9	323.5	337.2	355.1	353.6	100	98	88	87	91	96	95
		20-24	623.6	612.6	566.1	537.0	542.2	580.0	589.8	100	98	91	86	87	93	95
		Total	994.0	976.2	892.0	860.5	879.4	935.1	943.4	100	98	90	87	88	94	95
Students, ISCED 5 Total	Males	15-19	1135.0	1114.4	1000.4	990.9	1037.7	1093.0	1089.4	100	98	88	87	91	96	96
		20-24	3960.4	3877.1	3642.1	3407.2	3417.1	3651.8	3750.6	100	98	92	86	86	92	95
		Total	5095.4	4991.6	4642.5	4398.0	4454.8	4744.8	4840.0	100	98	91	86	87	93	95
	Females	15-19	1606.1	1572.9	1411.5	1399.4	1457.2	1533.6	1525.0	100	98	88	87	91	95	95
		20-24	4747.9	4629.8	4332.5	4059.5	4074.0	4339.5	4439.5	100	98	91	86	86	91	94
		Total	6354.0	6202.7	5744.0	5458.9	5531.3	5873.1	5964.5	100	98	90	86	87	92	94
	Total	15-19	2741.1	2687.4	2411.9	2390.3	2495.0	2626.6	2614.4	100	98	88	87	91	96	95
		20-24	8708.3	8506.9	7974.6	7466.6	7491.1	7991.3	8190.1	100	98	92	86	86	92	94
		Total	11449.4	11194.3	10386.5	9856.9	9986.0	10617.9	10804.5	100	98	91	86	87	93	94
Students, ISCED 5 Vocational	Males	15-19	213.4	209.3	188.1	186.2	195.2	205.5	204.8	100	98	88	87	91	96	96
		20-24	458.2	449.7	419.2	394.9	397.6	425.3	434.9	100	98	91	86	87	93	95
		Total	671.6	659.0	607.2	581.1	592.8	630.8	639.8	100	98	90	87	88	94	95
	Females	15-19	303.1	296.4	266.4	264.0	275.2	289.6	287.9	100	98	88	87	91	96	95
		20-24	584.2	571.5	530.9	500.8	504.3	537.7	547.9	100	98	91	86	86	92	94
		Total	887.3	867.9	797.3	764.8	779.5	827.3	835.7	100	98	90	86	88	93	94
	Total	15-19	516.5	505.8	454.4	450.2	470.4	495.1	492.7	100	98	88	87	91	96	95
		20-24	1042.5	1021.2	950.1	895.6	901.9	963.0	982.8	100	98	91	86	87	92	94
		Total	1558.9	1527.0	1404.5	1345.8	1372.3	1458.1	1475.5	100	98	90	86	88	94	95

Table C5: Projected number of VET graduates, ISCED 3-5, by gender and age group, EU-27, 2005-50, high population variant/constant education participation/constant graduation rates

			(000s)							2005=100						
		Age group	2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050
Students, ISCED 3 Prevocational	Males	15-19	114.6	110.7	101.0	99.7	106.2	112.2	112.5	100	97	88	87	93	98	98
		20-24	13.6	13.6	12.6	12.1	12.3	13.0	13.2	100	100	92	89	90	96	97
		Total	128.2	124.4	113.6	111.8	118.6	125.3	125.6	100	97	89	87	92	98	98
	Females	15-19	86.4	82.9	76.3	75.6	80.3	84.6	84.5	100	96	88	87	93	98	98
		20-24	6.0	6.0	5.6	5.3	5.4	5.7	5.8	100	100	92	88	90	95	95
		Total	92.5	88.9	81.8	80.9	85.7	90.3	90.2	100	96	88	87	93	98	98
	Total	15-19	201.1	193.6	177.3	175.3	186.6	196.8	196.9	100	96	88	87	93	98	98
		20-24	19.6	19.7	18.1	17.4	17.7	18.8	18.9	100	100	92	88	90	95	96
		Total	220.7	213.3	195.4	192.7	204.3	215.5	215.8	100	97	89	87	93	98	98
Students, ISCED 3 Vocational	Males	15-19	1235.7	1172.8	1094.7	1093.8	1166.5	1218.8	1223.3	100	95	89	89	94	99	99
		20-24	252.6	242.9	221.9	208.2	209.3	224.0	226.7	100	96	88	82	83	89	90
		Total	1488.2	1415.7	1316.6	1302.0	1375.7	1442.7	1450.0	100	95	88	87	92	97	97
	Females	15-19	1052.1	997.3	932.9	932.2	986.8	1028.9	1025.7	100	95	89	89	94	98	97
		20-24	172.1	165.7	150.8	142.9	143.3	151.8	152.3	100	96	88	83	83	88	88
		Total	1224.2	1163.0	1083.6	1075.1	1130.1	1180.7	1178.0	100	95	89	88	92	96	96
	Total	15-19	2287.8	2170.1	2027.6	2025.9	2153.3	2247.6	2249.0	100	95	89	89	94	98	98
		20-24	424.7	408.6	372.6	351.1	352.6	375.8	379.0	100	96	88	83	83	88	89
		Total	2712.5	2578.7	2400.2	2377.1	2505.9	2623.5	2628.0	100	95	88	88	92	97	97
Students, ISCED 4 Vocational	Males	15-19	60.0	59.8	54.0	53.8	56.3	59.2	59.4	100	100	90	90	94	99	99
		20-24	105.9	104.8	96.7	90.5	90.8	96.8	98.8	100	99	91	85	86	91	93
		Total	165.9	164.5	150.7	144.2	147.1	156.0	158.2	100	99	91	87	89	94	95
	Females	15-19	63.6	63.2	57.1	56.7	59.2	62.2	62.3	100	99	90	89	93	98	98
		20-24	119.9	115.9	106.6	99.3	100.1	107.0	108.1	100	97	89	83	84	89	90
		Total	183.5	179.1	163.7	156.0	159.3	169.1	170.3	100	98	89	85	87	92	93
	Total	15-19	123.6	122.9	111.1	110.5	115.4	121.4	121.7	100	99	90	89	93	98	98
		20-24	225.8	220.6	203.3	189.7	191.0	203.8	206.8	100	98	90	84	85	90	92
		Total	349.3	343.6	314.4	300.2	306.4	325.2	328.6	100	98	90	86	88	93	94
Students, ISCED 5B Vocational	Males	15-19	51.5	50.8	46.2	46.3	48.4	50.8	51.2	100	99	90	90	94	98	99
		20-24	110.8	110.0	103.1	98.2	99.6	106.3	109.2	100	99	93	89	90	96	99
		Total	162.3	160.9	149.3	144.5	148.1	157.1	160.4	100	99	92	89	91	97	99
	Females	15-19	65.3	63.5	58.2	58.7	61.5	64.4	64.6	100	97	89	90	94	99	99
		20-24	156.4	153.4	143.1	135.3	137.7	146.7	149.7	100	98	92	87	88	94	96
		Total	221.6	216.8	201.3	194.0	199.2	211.1	214.3	100	98	91	88	90	95	97
	Total	15-19	116.8	114.3	104.4	105.0	110.0	115.1	115.8	100	98	89	90	94	99	99
		20-24	267.1	263.4	246.2	233.5	237.3	253.0	258.9	100	99	92	87	89	95	97
		Total	384.0	377.7	350.6	338.5	347.3	368.2	374.7	100	98	91	88	90	96	98

Table C6: Projected number of VET graduates, ISCED 3-5, by gender and field of education, EU-27, 2005-50, high population variant/constant education participation/constant graduation rates

		(000s)							2005=100							
		2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050	
Students, ISCED 3 Prevocational	Males	Education	4.1	4.5	4.5	4.7	5.1	5.4	5.8	100	110	110	115	125	132	141
		Humanities	26.8	27.5	25.9	26.8	29.9	31.1	29.9	100	102	97	100	112	116	112
		Business	134.9	125.4	111.9	106.8	109.7	114.7	111.6	100	93	83	79	81	85	83
		Science	34.2	42.4	48.5	56.0	66.0	68.7	71.3	100	124	142	164	193	201	208
		Engineering	508.2	457.1	392.3	369.4	381.9	401.4	380.7	100	90	77	73	75	79	75
		Agriculture	41.7	36.0	30.5	28.4	29.1	30.3	28.3	100	86	73	68	70	73	68
		Health	15.8	17.1	17.0	18.0	20.0	21.0	21.0	100	108	108	114	127	133	133
		Services	98.7	94.3	87.1	87.6	95.7	100.4	97.0	100	96	88	89	97	102	98
		Unknown	623.8	611.4	598.7	604.1	638.3	669.7	704.4	100	98	96	97	102	107	113
	Total	1488.2	1415.7	1316.6	1302.0	1375.7	1442.7	1450.0	100	95	88	87	92	97	97	
	Females	Education	6.8	9.0	10.5	12.7	15.2	15.8	16.3	100	133	156	188	225	234	241
		Humanities	50.5	51.3	47.8	49.1	54.4	56.5	53.9	100	102	95	97	108	112	107
		Business	277.6	255.0	225.8	216.5	224.0	234.2	222.0	100	92	81	78	81	84	80
		Science	11.2	12.6	13.4	14.4	16.3	17.0	16.9	100	112	119	128	145	151	150
		Engineering	101.6	85.5	71.9	67.6	70.3	73.3	65.6	100	84	71	67	69	72	65
		Agriculture	24.5	21.6	18.4	17.4	18.2	19.1	17.8	100	88	75	71	74	78	73
		Health	110.3	111.0	105.5	106.9	112.6	116.7	117.9	100	101	96	97	102	106	107
		Services	120.2	110.6	96.8	93.1	96.7	101.2	97.4	100	92	81	77	80	84	81
Unknown		521.7	506.5	493.4	497.5	522.4	546.9	570.3	100	97	95	95	100	105	109	
Total	1224.2	1163.0	1083.6	1075.1	1130.1	1180.7	1178.0	100	95	89	88	92	96	96		
Total	Education	10.9	13.5	15.1	17.4	20.4	21.3	22.1	100	124	138	160	187	196	203	
	Humanities	77.3	78.8	73.7	75.8	84.3	87.6	83.8	100	102	95	98	109	113	108	
	Business	412.5	380.3	337.7	323.4	333.6	348.9	333.6	100	92	82	78	81	85	81	
	Science	45.5	55.0	61.9	70.4	82.3	85.8	88.2	100	121	136	155	181	189	194	
	Engineering	609.8	542.6	464.2	437.0	452.3	474.6	446.3	100	89	76	72	74	78	73	
	Agriculture	66.2	57.7	48.9	45.8	47.3	49.3	46.0	100	87	74	69	71	75	70	
	Health	126.1	128.1	122.6	124.9	132.6	137.8	138.9	100	102	97	99	105	109	110	
	Services	218.9	204.9	184.0	180.7	192.4	201.6	194.4	100	94	84	83	88	92	89	
	Unknown	1145.5	1117.9	1092.1	1101.6	1160.7	1216.6	1274.7	100	98	95	96	101	106	111	
Total	2712.5	2578.7	2400.2	2377.1	2505.9	2623.5	2628.0	100	95	88	88	92	97	97		
Students, ISCED 4 Vocational	Males	Education	0.1	0.2	0.1	0.1	0.1	0.2	0.2	100	102	98	92	97	103	105
		Humanities	6.7	6.7	6.2	6.0	6.4	6.9	6.9	100	100	93	90	96	102	103
		Business	30.7	30.3	27.2	25.7	25.6	27.2	27.6	100	99	89	84	83	88	90
		Science	19.3	18.8	17.8	17.1	18.0	19.1	19.5	100	97	92	89	93	99	101
		Engineering	64.5	64.7	58.5	56.4	56.5	59.8	61.0	100	100	91	88	88	93	95
		Agriculture	6.1	5.9	5.3	5.2	5.5	5.9	5.8	100	96	87	86	90	96	95
		Health	6.7	6.9	6.4	6.1	6.3	6.8	6.8	100	102	95	90	94	100	100
		Services	21.6	21.3	19.9	18.6	19.2	20.5	21.0	100	99	92	86	89	95	97
		Unknown	10.1	9.8	9.2	8.9	9.4	9.9	9.4	100	97	92	88	93	98	94
	Total	165.9	164.5	150.7	144.2	147.1	156.0	158.2	100	99	91	87	89	94	95	
	Females	Education	2.4	2.6	2.6	2.5	2.7	2.9	2.9	100	106	107	104	111	117	120
		Humanities	10.4	10.2	9.7	9.6	10.5	11.2	11.3	100	97	93	92	101	108	108
		Business	70.7	69.0	63.4	60.8	61.6	65.2	66.6	100	98	90	86	87	92	94
		Science	7.8	7.3	7.0	6.6	7.0	7.5	7.6	100	94	90	85	90	96	97
		Engineering	7.9	7.4	6.2	5.4	5.0	5.4	5.4	100	93	78	68	64	68	69
		Agriculture	2.0	2.0	1.8	1.8	1.8	2.0	2.0	100	100	91	89	91	97	98
		Health	39.5	39.8	35.3	34.1	34.9	37.2	36.8	100	101	89	86	88	94	93
		Services	30.9	29.4	26.5	24.1	23.9	25.5	26.0	100	95	86	78	78	83	84
Unknown		11.8	11.4	11.2	11.0	11.8	12.4	11.7	100	96	94	93	100	105	99	
Total	183.5	179.1	163.7	156.0	159.3	169.1	170.3	100	98	89	85	87	92	93		
Total	Education	2.6	2.7	2.8	2.7	2.9	3.0	3.1	100	106	107	103	110	116	119	
	Humanities	17.1	16.8	15.9	15.7	17.0	18.1	18.2	100	98	93	91	99	105	106	
	Business	101.4	99.3	90.6	86.5	87.2	92.4	94.2	100	98	89	85	86	91	93	
	Science	27.1	26.2	24.8	23.8	25.0	26.6	27.0	100	96	91	88	92	98	100	
	Engineering	72.3	72.1	64.7	61.8	61.5	65.1	66.4	100	100	89	85	85	90	92	
	Agriculture	8.2	7.9	7.2	7.1	7.4	7.8	7.8	100	97	88	86	90	96	96	
	Health	46.2	46.7	41.7	40.1	41.2	43.9	43.6	100	101	90	87	89	95	94	
	Services	52.4	50.6	46.4	42.6	43.2	45.9	47.0	100	97	88	81	82	88	90	
	Unknown	21.9	21.1	20.4	19.9	21.2	22.3	21.2	100	96	93	91	97	102	97	
Total	349.3	343.6	314.4	300.2	306.4	325.2	328.6	100	98	90	86	88	93	94		

Students, ISCED 5B Vocational	Males	Education	5.8	6.0	5.8	5.4	5.5	5.9	6.2	100	104	101	94	95	101	107	
		Humanities	7.9	7.9	7.5	7.1	7.4	7.9	7.9	7.9	100	100	95	90	94	101	100
		Business	38.1	37.9	35.1	33.9	34.3	36.3	37.9	100	100	92	89	90	95	100	100
		Science	21.6	21.7	20.6	20.1	21.0	22.5	22.5	100	100	95	93	97	104	104	104
		Engineering	60.7	59.3	54.3	53.1	54.2	57.3	58.3	100	98	89	87	89	94	96	96
		Agriculture	2.5	2.5	2.2	2.0	2.0	2.1	2.1	100	97	87	79	77	82	82	82
		Health	13.9	14.3	13.5	13.2	13.6	14.4	15.0	100	102	97	94	97	103	107	107
		Services	10.9	10.4	9.5	9.1	9.4	10.1	9.8	100	96	88	84	87	93	90	90
		Unknown	0.9	0.9	0.8	0.7	0.6	0.7	0.7	100	102	87	75	70	75	77	77
		Total	162.3	160.9	149.3	144.5	148.1	157.1	160.4	100	99	92	89	91	97	99	99
	Females	Education	21.9	21.7	19.9	18.5	18.8	20.0	20.2	100	99	91	84	86	91	92	
		Humanities	10.0	9.7	9.3	9.0	9.5	10.1	9.9	100	98	93	90	95	102	100	
		Business	82.2	80.5	74.7	73.1	75.4	79.6	81.5	100	98	91	89	92	97	99	
		Science	6.8	6.6	6.2	6.0	6.2	6.6	6.5	100	96	90	87	91	97	95	
		Engineering	13.2	12.8	11.8	11.5	11.9	12.6	12.6	100	97	89	87	90	95	95	
		Agriculture	1.6	1.5	1.4	1.2	1.2	1.3	1.3	100	95	85	77	77	83	82	
		Health	68.2	67.2	62.4	59.6	60.4	64.0	65.9	100	98	91	87	89	94	97	
		Services	16.7	15.8	14.6	14.2	14.9	15.9	15.4	100	95	88	85	90	96	93	
		Unknown	1.0	1.1	1.0	0.9	0.9	0.9	1.0	100	104	94	86	84	90	94	
		Total	221.6	216.8	201.3	194.0	199.2	211.1	214.3	100	98	91	88	90	95	97	
	Total	Education	27.7	27.7	25.8	23.9	24.3	25.9	26.4	100	100	93	86	88	93	95	
		Humanities	17.8	17.6	16.8	16.1	16.8	18.0	17.8	100	99	94	90	94	101	100	
		Business	120.2	118.4	109.8	106.9	109.7	115.8	119.4	100	98	91	89	91	96	99	
		Science	28.5	28.3	26.8	26.1	27.3	29.1	29.0	100	99	94	92	96	102	102	
		Engineering	73.9	72.1	66.1	64.6	66.1	69.9	71.0	100	98	89	87	89	95	96	
		Agriculture	4.2	4.0	3.6	3.2	3.2	3.4	3.4	100	96	86	78	77	82	82	
		Health	82.1	81.4	75.9	72.8	74.0	78.4	80.9	100	99	92	89	90	95	98	
		Services	27.5	26.3	24.1	23.3	24.4	26.0	25.2	100	95	88	85	89	95	92	
		Unknown	1.9	2.0	1.8	1.6	1.5	1.6	1.7	100	103	91	81	77	83	86	
		Total	384.0	377.7	350.5	338.5	347.3	368.2	374.7	100	98	91	88	90	96	98	

Figure C5: Projected number of students in prevocational and vocational streams, by ISCED level, EU-27, 2005-30, high population variant/constant education participation

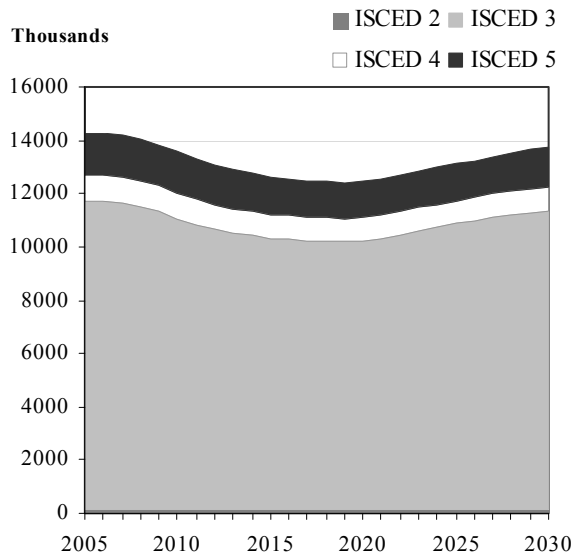


Figure C6: Percentage of students in prevocational and vocational streams, by ISCED level, EU-27, 2005-30, high population variant/constant education participation

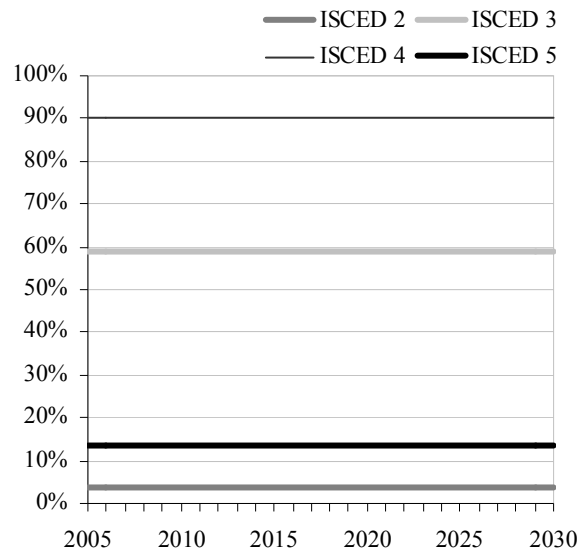


Figure C7: Projected number of VET graduates, by ISCED level, EU-27, 2005-30, high population variant/constant education participation/constant graduation rates

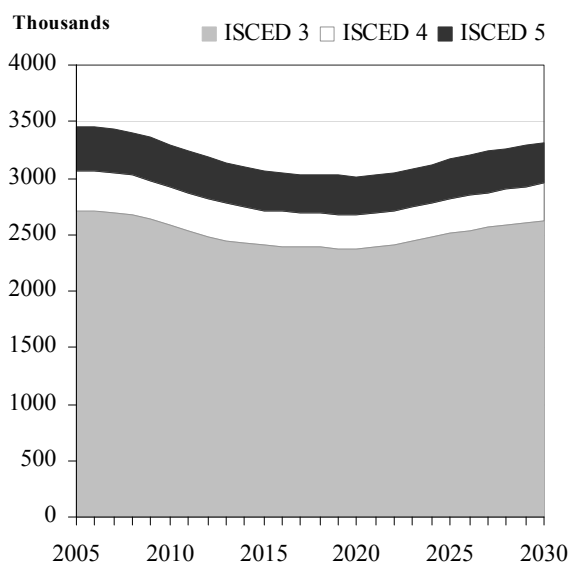
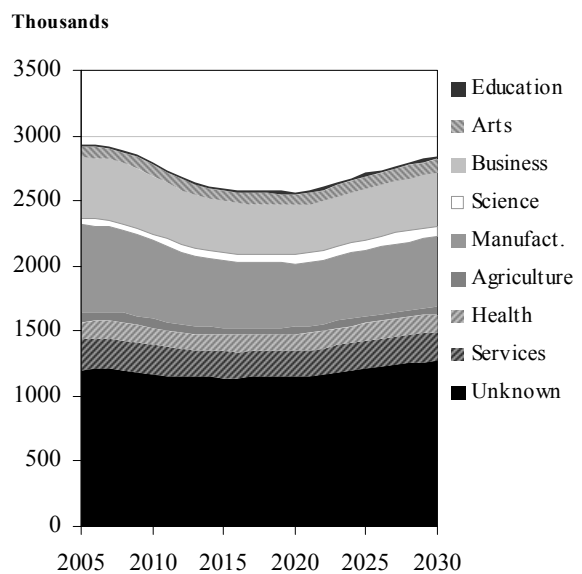


Figure C8: Projected number of VET graduates, ISCED 3, by field of education, EU-27, 2005-30, high population variant/constant education participation/constant graduation rates



Students, ISCED 3 Vocational	Males	15-19	5005.7	4662.1	4297.3	4200.6	3839.7	3551.6	2889.3	100	93	86	84	77	71	58
		20-24	711.9	689.2	632.1	590.6	575.2	524.7	418.2	100	97	89	83	81	74	59
		Total	5717.7	5351.3	4929.4	4791.2	4414.9	4076.3	3307.5	100	94	86	84	77	71	58
	Females	15-19	4246.3	3960.5	3656.9	3570.6	3243.1	2998.9	2435.5	100	93	86	84	76	71	57
		20-24	589.8	572.7	527.8	490.4	477.3	434.1	344.8	100	97	89	83	81	74	58
		Total	4836.1	4533.2	4184.6	4061.1	3720.4	3433.0	2780.3	100	94	87	84	77	71	57
	Total	15-19	9252.0	8622.6	7954.2	7771.2	7082.9	6550.5	5324.8	100	93	86	84	77	71	58
		20-24	1301.8	1262.0	1159.9	1081.0	1052.5	958.8	762.9	100	97	89	83	81	74	59
		Total	10553.8	9884.5	9114.1	8852.3	8135.3	7509.3	6087.8	100	94	86	84	77	71	58
Students, ISCED 4 Total	Males	15-19	194.0	188.7	167.0	164.0	152.7	140.1	113.4	100	97	86	85	79	72	58
		20-24	344.8	334.5	305.5	286.4	279.1	254.0	202.7	100	97	89	83	81	74	59
		Total	538.8	523.2	472.4	450.5	431.8	394.1	316.1	100	97	88	84	80	73	59
	Females	15-19	213.6	207.0	183.6	180.4	166.8	152.8	123.5	100	97	86	84	78	72	58
		20-24	343.8	331.9	302.9	284.0	276.0	250.2	199.3	100	97	88	83	80	73	58
		Total	557.4	538.9	486.5	464.4	442.7	403.0	322.9	100	97	87	83	79	72	58
	Total	15-19	407.6	395.7	350.6	344.4	319.5	292.9	236.9	100	97	86	85	78	72	58
		20-24	688.6	666.4	608.4	570.4	555.0	504.2	402.1	100	97	88	83	81	73	58
		Total	1096.2	1062.1	959.0	914.9	874.5	797.1	639.0	100	97	87	83	80	73	58
Students, ISCED 4 Vocational	Males	15-19	175.4	170.5	151.0	148.3	138.0	126.6	102.5	100	97	86	85	79	72	58
		20-24	311.4	302.1	275.9	258.7	252.1	229.4	183.1	100	97	89	83	81	74	59
		Total	486.8	472.7	426.9	407.0	390.1	356.0	285.6	100	97	88	84	80	73	59
	Females	15-19	193.8	187.8	166.6	163.7	151.3	138.7	112.1	100	97	86	84	78	72	58
		20-24	310.1	299.3	273.2	256.2	248.9	225.6	179.8	100	97	88	83	80	73	58
		Total	503.9	487.1	439.8	419.9	400.2	364.3	291.9	100	97	87	83	79	72	58
	Total	15-19	369.3	358.3	317.6	312.0	289.3	265.3	214.6	100	97	86	84	78	72	58
		20-24	621.5	601.5	549.1	514.8	501.0	455.0	362.9	100	97	88	83	81	73	58
		Total	990.7	959.8	866.7	826.8	790.3	720.3	577.5	100	97	87	83	80	73	58
Students, ISCED 5 Total	Males	15-19	1132.0	1098.3	974.3	955.4	889.5	816.1	661.0	100	97	86	84	79	72	58
		20-24	3947.2	3808.9	3531.5	3263.2	3187.1	2917.4	2315.6	100	96	89	83	81	74	59
		Total	5079.2	4907.2	4505.8	4218.6	4076.6	3733.5	2976.7	100	97	89	83	80	74	59
	Females	15-19	1600.8	1550.3	1376.4	1351.1	1249.3	1145.0	925.7	100	97	86	84	78	72	58
		20-24	4729.7	4534.5	4193.3	3882.1	3784.2	3444.1	2731.2	100	96	89	82	80	73	58
		Total	6330.5	6084.8	5569.7	5233.1	5033.5	4589.1	3656.9	100	96	88	83	80	72	58
	Total	15-19	2732.9	2648.5	2350.8	2306.5	2138.8	1961.1	1586.7	100	97	86	84	78	72	58
		20-24	8676.9	8343.5	7724.7	7145.2	6971.4	6361.5	5046.8	100	96	89	82	80	73	58
		Total	11409.7	10992.0	10075.5	9451.7	9110.1	8322.7	6633.6	100	96	88	83	80	73	58
Students, ISCED 5 Vocational	Males	15-19	212.8	206.3	183.2	179.6	167.1	153.4	124.2	100	97	86	84	79	72	58
		20-24	456.8	442.0	406.7	378.5	369.2	337.1	268.3	100	97	89	83	81	74	59
		Total	669.6	648.3	589.8	558.1	536.3	490.4	392.5	100	97	88	83	80	73	59
	Females	15-19	302.1	292.2	259.8	254.9	235.6	216.0	174.6	100	97	86	84	78	71	58
		20-24	582.0	560.1	514.2	479.4	466.4	423.6	336.8	100	96	88	82	80	73	58
		Total	884.1	852.3	774.0	734.3	702.0	639.6	511.4	100	96	88	83	79	72	58
	Total	15-19	514.9	498.5	443.0	434.5	402.7	369.4	298.9	100	97	86	84	78	72	58
		20-24	1038.7	1002.0	920.9	857.9	835.6	760.7	605.0	100	96	89	83	80	73	58
		Total	1553.7	1500.5	1363.8	1292.3	1238.3	1130.0	903.9	100	97	88	83	80	73	58

Table C8: Projected number of VET graduates, ISCED 3-5, by gender and age group, EU-27, 2005-50, low population variant/constant education participation/constant graduation rates

			(000s)							2005=100						
		Age group	2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050
Students, ISCED 3 Prevocational	Males	15-19	114.3	109.2	98.5	96.0	89.1	82.6	67.6	100	95	86	84	78	72	59
		20-24	13.6	13.4	12.2	11.6	11.2	10.1	8.1	100	99	90	85	83	75	60
		Total	127.9	122.6	110.7	107.6	100.3	92.7	75.7	100	96	87	84	78	73	59
	Females	15-19	86.2	81.8	74.5	72.9	67.1	62.2	50.8	100	95	86	85	78	72	59
		20-24	6.0	5.9	5.4	5.1	4.9	4.4	3.5	100	98	90	85	82	74	59
		Total	92.2	87.7	79.9	78.0	72.0	66.6	54.3	100	95	87	85	78	72	59
	Total	15-19	200.5	191.0	173.0	168.9	156.2	144.8	118.4	100	95	86	84	78	72	59
		20-24	19.6	19.3	17.6	16.7	16.1	14.6	11.6	100	99	90	85	82	74	59
		Total	220.1	210.3	190.6	185.6	172.3	159.4	130.0	100	96	87	84	78	72	59
Students, ISCED 3 Vocational	Males	15-19	1232.6	1156.7	1068.2	1050.3	963.5	889.7	730.8	100	94	87	85	78	72	59
		20-24	251.8	238.9	215.4	199.8	193.1	176.1	139.7	100	95	86	79	77	70	55
		Total	1484.4	1395.5	1283.6	1250.1	1156.6	1065.8	870.5	100	94	86	84	78	72	59
	Females	15-19	1049.3	984.9	912.3	896.8	815.3	751.6	613.5	100	94	87	85	78	72	58
		20-24	171.5	162.4	146.1	136.9	132.1	119.3	93.6	100	95	85	80	77	70	55
		Total	1220.8	1147.3	1058.3	1033.7	947.4	870.9	707.0	100	94	87	85	78	71	58
	Total	15-19	2281.9	2141.6	1980.5	1947.2	1778.8	1641.3	1344.3	100	94	87	85	78	72	59
		20-24	423.2	401.3	361.4	336.6	325.2	295.5	233.2	100	95	85	80	77	70	55
		Total	2705.1	2542.9	2341.9	2283.8	2104.0	1936.7	1577.5	100	94	87	84	78	72	58
Students, ISCED 4 Vocational	Males	15-19	59.8	58.9	52.6	51.8	48.2	44.2	36.1	100	98	88	87	81	74	60
		20-24	105.6	103.0	93.9	86.8	84.0	76.1	60.9	100	98	89	82	80	72	58
		Total	165.4	161.9	146.5	138.6	132.2	120.3	96.9	100	98	89	84	80	73	59
	Females	15-19	63.4	62.3	55.7	54.8	50.6	46.4	37.8	100	98	88	86	80	73	60
		20-24	119.4	113.6	103.3	95.1	92.4	83.9	66.4	100	95	86	80	77	70	56
		Total	182.8	175.9	159.0	149.8	143.0	130.3	104.2	100	96	87	82	78	71	57
	Total	15-19	123.2	121.2	108.3	106.6	98.8	90.5	73.8	100	98	88	87	80	73	60
		20-24	225.0	216.6	197.2	181.9	176.5	160.0	127.3	100	96	88	81	78	71	57
		Total	348.2	337.7	305.5	288.5	275.3	250.6	201.1	100	97	88	83	79	72	58
Students, ISCED 5B Vocational	Males	15-19	51.4	50.1	45.0	44.6	41.6	37.9	31.1	100	97	88	87	81	74	60
		20-24	110.4	108.1	100.0	94.2	92.4	84.1	67.3	100	98	91	85	84	76	61
		Total	161.8	158.2	145.0	138.8	134.0	122.0	98.4	100	98	90	86	83	75	61
	Females	15-19	65.1	62.6	56.7	56.6	52.7	48.0	39.2	100	96	87	87	81	74	60
		20-24	155.8	150.3	138.6	129.5	127.4	115.6	92.1	100	96	89	83	82	74	59
		Total	220.8	212.9	195.3	186.2	180.1	163.6	131.2	100	96	88	84	82	74	59
	Total	15-19	116.5	112.7	101.7	101.3	94.3	86.0	70.3	100	97	87	87	81	74	60
		20-24	266.2	258.4	238.6	223.7	219.9	199.7	159.4	100	97	90	84	83	75	60
		Total	382.7	371.1	340.3	325.0	314.1	285.6	229.6	100	97	89	85	82	75	60

Students, ISCED 5B Vocational															
Males	Education	5.8	5.9	5.7	5.2	5.0	4.5	3.8	100	103	98	90	86	79	66
	Humanities	7.8	7.7	7.2	6.8	6.7	6.2	4.8	100	99	92	87	85	78	61
	Business	38.0	37.3	34.1	32.5	31.1	28.2	23.3	100	98	90	86	82	74	61
	Science	21.6	21.3	20.0	19.3	19.0	17.4	13.8	100	99	93	89	88	81	64
	Engineering	60.5	58.3	52.7	51.0	49.0	44.5	35.8	100	96	87	84	81	74	59
	Agriculture	2.5	2.4	2.1	1.9	1.8	1.6	1.3	100	96	84	76	70	64	50
	Health	13.9	14.0	13.1	12.6	12.3	11.2	9.2	100	101	95	91	88	80	66
	Services	10.8	10.3	9.3	8.8	8.5	7.9	6.0	100	95	85	81	79	72	56
	Unknown	0.9	0.9	0.8	0.7	0.6	0.5	0.4	100	101	85	72	63	58	47
	Total	161.8	158.2	145.0	138.8	134.0	122.0	98.4	100	98	90	86	83	75	61
Females	Education	21.9	21.3	19.4	17.7	17.0	15.5	12.4	100	97	89	81	78	71	57
	Humanities	9.9	9.6	9.0	8.6	8.5	7.8	6.1	100	96	91	87	86	79	61
	Business	81.9	79.0	72.5	70.1	68.2	61.7	49.9	100	97	89	86	83	75	61
	Science	6.8	6.5	6.0	5.7	5.6	5.1	4.0	100	95	88	84	83	75	59
	Engineering	13.2	12.6	11.4	11.1	10.8	9.8	7.7	100	95	87	84	82	74	59
	Agriculture	1.6	1.5	1.3	1.2	1.1	1.0	0.8	100	94	83	74	70	64	51
	Health	67.9	65.9	60.6	57.2	54.6	49.6	40.4	100	97	89	84	80	73	59
	Services	16.6	15.5	14.2	13.6	13.5	12.3	9.4	100	94	85	82	81	74	57
	Unknown	1.0	1.0	0.9	0.8	0.8	0.7	0.6	100	103	92	83	76	70	58
	Total	220.8	212.9	195.3	186.2	180.1	163.6	131.2	100	96	88	84	82	74	59
Total	Education	27.6	27.2	25.0	22.9	22.0	20.1	16.2	100	98	91	83	80	73	59
	Humanities	17.8	17.3	16.3	15.4	15.2	14.0	10.9	100	97	92	87	86	79	61
	Business	119.8	116.3	106.6	102.7	99.2	89.8	73.1	100	97	89	86	83	75	61
	Science	28.4	27.8	26.0	25.0	24.7	22.6	17.8	100	98	92	88	87	80	63
	Engineering	73.7	70.9	64.2	62.1	59.8	54.3	43.5	100	96	87	84	81	74	59
	Agriculture	4.1	3.9	3.5	3.1	2.9	2.7	2.1	100	95	84	75	70	64	50
	Health	81.8	80.0	73.7	69.9	66.9	60.8	49.5	100	98	90	85	82	74	61
	Services	27.4	25.8	23.4	22.4	22.1	20.2	15.5	100	94	85	82	80	74	56
	Unknown	1.9	2.0	1.7	1.5	1.3	1.2	1.0	100	102	89	78	70	65	53
	Total	382.7	371.1	340.3	325.0	314.1	285.6	229.6	100	97	89	85	82	75	60

Figure C9: Projected number of students in prevocational and vocational streams by ISCED level, EU-27, 2005-30, low population variant/constant education participation

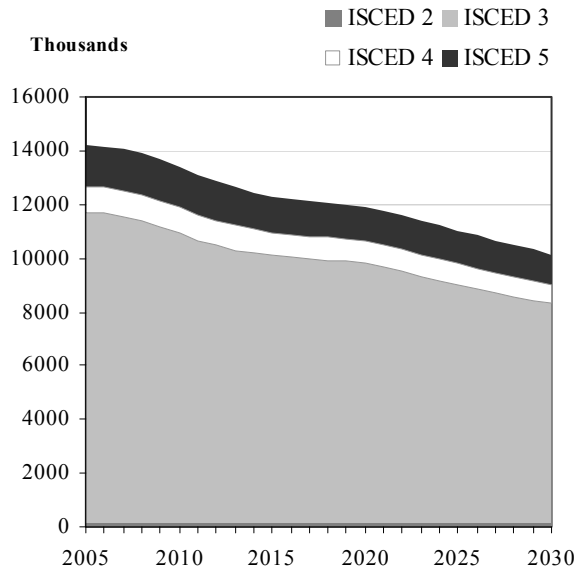


Figure C10: Percentage of students in prevocational and vocational streams by ISCED level, EU-27, 2005-30, low population variant/constant education participation

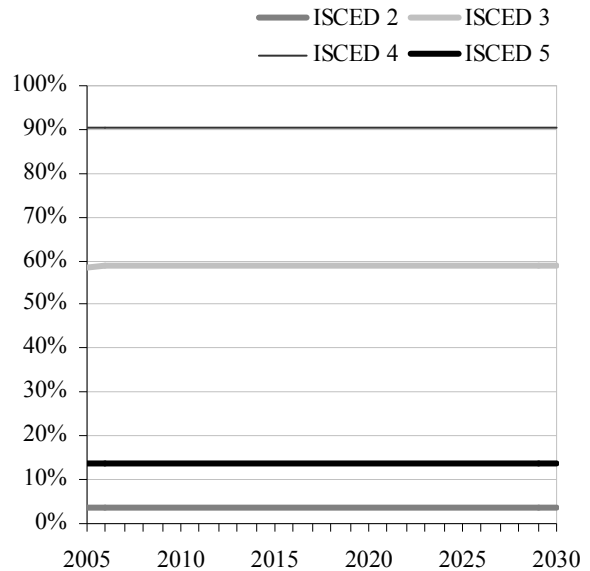


Figure C11: Projected number of VET graduates by ISCED level, EU-27, 2005-30, low population variant/constant education participation/constant graduation rates

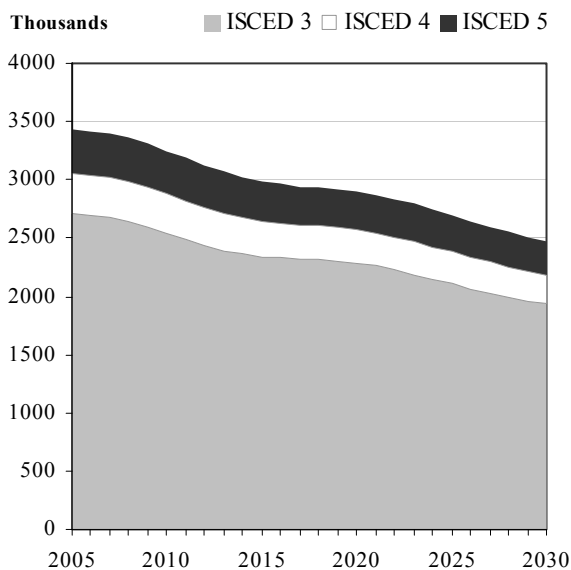
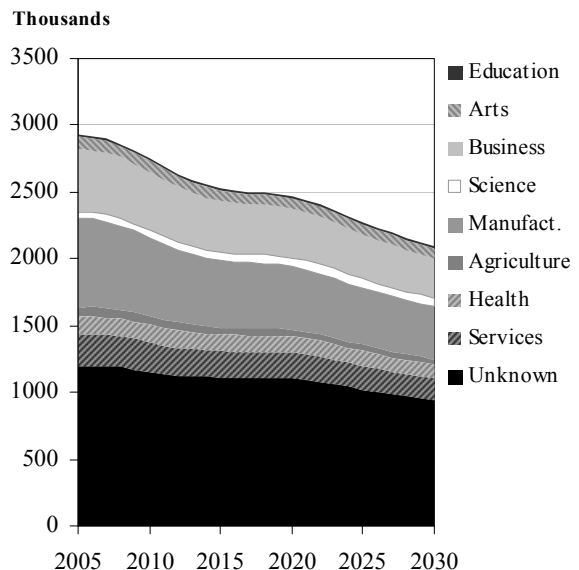


Figure C12: Projected number of VET graduates, ISCED 3, by field of education, EU-27, 2005-30, low population variant/constant education participation/constant graduation rates



Students, ISCED 3 Vocational	Males	15-19	5011.8	4955.8	4919.3	4928.3	4952.9	4954.5	4918.9	100	99	98	98	99	99	
		20-24	713.1	769.5	774.2	753.6	734.8	734.2	757.0	100	108	109	106	103	103	106
		Total	5724.9	5725.3	5693.5	5681.9	5687.7	5688.7	5675.9	100	100	99	99	99	99	99
	Females	15-19	4251.4	4226.8	4212.9	4222.0	4229.1	4228.1	4211.1	100	99	99	99	99	99	99
		20-24	591.0	640.0	660.7	640.1	625.7	625.8	651.9	100	108	112	108	106	106	110
		Total	4842.4	4866.8	4873.6	4862.1	4854.8	4853.9	4863.1	100	101	101	100	100	100	100
	Total	15-19	9263.2	9182.6	9132.3	9150.3	9182.0	9182.6	9130.1	100	99	99	99	99	99	99
		20-24	1304.1	1409.5	1434.9	1393.8	1360.5	1360.0	1408.9	100	108	110	107	104	104	108
		Total	10567.4	10592.1	10567.2	10544.1	10542.6	10542.7	10539.0	100	100	100	100	100	100	100
Students, ISCED 4 Total	Males	15-19	194.3	198.9	193.6	199.6	202.1	202.1	200.3	100	102	100	103	104	104	103
		20-24	345.4	342.9	342.1	337.5	334.7	335.2	333.9	100	99	99	98	97	97	97
		Total	539.7	541.8	535.7	537.2	536.8	537.3	534.3	100	100	99	100	99	100	99
	Females	15-19	213.9	216.6	212.7	217.5	218.8	218.6	216.1	100	101	99	102	102	102	101
		20-24	344.5	343.0	338.2	330.2	324.3	323.0	320.0	100	100	98	96	94	94	93
		Total	558.4	559.6	550.9	547.7	543.0	541.6	536.1	100	100	99	98	97	97	96
	Total	15-19	408.2	415.5	406.3	417.1	420.8	420.6	416.5	100	102	100	102	103	103	102
		20-24	689.9	685.9	680.3	667.8	659.0	658.3	653.9	100	99	99	97	96	95	95
		Total	1098.1	1101.5	1086.6	1084.9	1079.8	1078.9	1070.4	100	100	99	99	98	98	97
Students, ISCED 4 Vocational	Males	15-19	175.7	179.4	177.5	183.4	186.8	186.8	186.8	100	102	101	104	106	106	106
		20-24	311.9	308.3	311.4	307.7	306.5	307.4	308.6	100	99	100	99	98	99	99
		Total	487.6	487.7	488.9	491.1	493.3	494.2	495.4	100	100	100	101	101	101	102
	Females	15-19	194.1	196.3	196.0	200.6	202.9	202.7	202.1	100	101	101	103	104	104	104
		20-24	310.7	308.5	307.6	300.7	296.2	295.5	294.9	100	99	99	97	95	95	95
		Total	504.8	504.8	503.6	501.3	499.1	498.2	497.0	100	100	100	99	99	99	98
	Total	15-19	369.8	375.6	373.4	384.0	389.7	389.5	388.9	100	102	101	104	105	105	105
		20-24	622.6	616.8	619.0	608.4	602.8	603.0	603.5	100	99	99	98	97	97	97
		Total	992.4	992.5	992.5	992.4	992.4	992.4	992.4	100	100	100	100	100	100	100
Students, ISCED 5 Total	Males	15-19	1133.6	1107.1	1023.3	1028.0	1029.6	1014.8	925.7	100	98	90	91	91	90	82
		20-24	3954.3	3813.2	3594.8	3339.0	3316.9	3298.8	2988.4	100	96	91	84	84	83	76
		Total	5087.8	4920.3	4618.1	4367.0	4346.5	4313.6	3914.1	100	97	91	86	85	85	77
	Females	15-19	1603.5	1562.5	1440.3	1446.3	1435.3	1413.7	1281.9	100	97	90	90	90	88	80
		20-24	4738.9	4539.0	4265.9	3966.8	3936.7	3902.5	3516.7	100	96	90	84	83	82	74
		Total	6342.4	6101.5	5706.2	5413.1	5372.0	5316.2	4798.6	100	96	90	85	85	84	76
	Total	15-19	2737.1	2669.6	2463.6	2474.3	2464.9	2428.5	2207.6	100	98	90	90	90	89	81
		20-24	8693.2	8352.2	7860.7	7305.8	7253.6	7201.3	6505.1	100	96	90	84	83	83	75
		Total	11430.3	11021.8	10324.3	9780.1	9718.5	9629.8	8712.7	100	96	90	86	85	84	76
Students, ISCED 5 Vocational	Males	15-19	213.1	214.4	214.1	224.3	223.8	222.9	224.0	100	101	100	105	105	105	105
		20-24	457.6	453.4	457.8	448.8	454.2	456.7	455.4	100	99	100	98	99	100	100
		Total	670.7	667.8	671.9	673.1	678.0	679.6	679.4	100	100	100	100	101	101	101
	Females	15-19	302.6	305.3	301.0	310.5	305.3	304.6	303.8	100	101	99	103	101	101	100
		20-24	583.1	583.3	583.6	572.8	573.1	572.2	573.2	100	100	100	98	98	98	98
		Total	885.7	888.6	884.6	883.3	878.4	876.8	877.0	100	100	100	100	99	99	99
	Total	15-19	515.7	519.7	515.0	534.8	529.1	527.5	527.7	100	101	100	104	103	102	102
		20-24	1040.7	1036.7	1041.4	1021.6	1027.3	1028.9	1028.7	100	100	100	98	99	99	99
		Total	1556.4	1556.4	1556.4	1556.4	1556.4	1556.4	1556.4	100	100	100	100	100	100	100

Table C11: Projected number of VET graduates, ISCED 3-5, by gender and age group, EU-27, 2005-50, baseline variant/increased vocational education participation/constant graduation rates

			(000s)							2005=100						
		Age group	2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050
Students, ISCED 3 Prevocational	Males	15-19	114.5	118.7	114.8	113.8	117.7	119.4	117.6	100	104	100	99	103	104	103
		20-24	13.6	13.3	13.2	12.7	13.4	13.9	13.1	100	98	97	93	98	102	96
		Total	128.1	132.0	128.0	126.5	131.0	133.3	130.7	100	103	100	99	102	104	102
	Females	15-19	86.3	88.8	86.4	86.5	89.0	90.2	89.1	100	103	100	100	103	105	103
		20-24	6.0	5.8	5.7	5.5	5.7	6.0	5.7	100	96	95	91	95	99	94
		Total	92.3	94.6	92.1	92.0	94.7	96.2	94.7	100	102	100	100	103	104	103
	Total	15-19	200.8	207.5	201.1	200.3	206.6	209.7	206.7	100	103	100	100	103	104	103
		20-24	19.6	19.1	18.9	18.2	19.1	19.8	18.8	100	97	96	93	97	101	96
		Total	220.4	226.6	220.0	218.5	225.7	229.5	225.5	100	103	100	99	102	104	102
Students, ISCED 3 Vocational	Males	15-19	1234.1	1229.7	1222.6	1228.2	1232.1	1233.3	1237.2	100	100	99	100	100	100	100
		20-24	252.2	265.8	262.7	253.5	246.1	245.9	251.6	100	105	104	101	98	98	100
		Total	1486.3	1495.5	1485.2	1481.7	1478.2	1479.2	1488.8	100	101	100	100	99	100	100
	Females	15-19	1050.7	1050.4	1049.7	1055.0	1052.2	1051.3	1052.7	100	100	100	100	100	100	100
		20-24	171.8	181.0	181.9	177.2	172.9	171.7	175.8	100	105	106	103	101	100	102
		Total	1222.5	1231.3	1231.6	1232.2	1225.2	1222.9	1228.5	100	101	101	101	100	100	100
	Total	15-19	2284.8	2280.1	2272.2	2283.2	2284.3	2284.5	2290.0	100	100	99	100	100	100	100
		20-24	424.0	446.7	444.6	430.7	419.0	417.6	427.4	100	105	105	102	99	98	101
		Total	2708.8	2726.8	2716.8	2713.9	2703.4	2702.1	2717.4	100	101	100	100	100	100	100
Students, ISCED 4 Vocational	Males	15-19	59.9	62.0	62.1	64.4	65.8	65.7	66.3	100	104	104	107	110	110	111
		20-24	105.8	105.1	106.0	103.3	102.2	102.0	102.6	100	99	100	98	97	96	97
		Total	165.7	167.1	168.1	167.6	168.0	167.8	168.9	100	101	101	101	101	101	102
	Females	15-19	63.5	65.3	65.9	67.3	68.4	68.2	68.6	100	103	104	106	108	107	108
		20-24	119.6	117.1	116.3	111.5	109.9	109.7	108.9	100	98	97	93	92	92	91
		Total	183.1	182.4	182.2	178.8	178.3	178.0	177.5	100	100	100	98	97	97	97
	Total	15-19	123.4	127.3	128.0	131.7	134.2	133.9	134.9	100	103	104	107	109	109	109
		20-24	225.4	222.3	222.4	214.8	212.1	211.8	211.5	100	99	99	95	94	94	94
		Total	348.8	349.5	350.3	346.5	346.3	345.7	346.4	100	100	100	99	99	99	99
Students, ISCED 5B Vocational	Males	15-19	51.5	52.1	52.6	55.7	55.5	55.1	56.0	100	101	102	108	108	107	109
		20-24	110.6	111.0	112.6	111.8	114.0	114.2	114.5	100	100	102	101	103	103	103
		Total	162.1	163.0	165.2	167.5	169.5	169.3	170.5	100	101	102	103	105	104	105
	Females	15-19	65.2	65.4	65.7	68.9	68.2	67.7	68.2	100	100	101	106	105	104	105
		20-24	156.1	156.5	157.3	154.8	156.5	156.1	156.7	100	100	101	99	100	100	100
		Total	221.2	221.9	223.0	223.7	224.8	223.8	224.8	100	100	101	101	102	101	102
	Total	15-19	116.6	117.4	118.3	124.7	123.8	122.8	124.2	100	101	101	107	106	105	106
		20-24	266.7	267.5	269.9	266.5	270.5	270.3	271.1	100	100	101	100	101	101	102
		Total	383.3	384.9	388.3	391.2	394.3	393.1	395.3	100	100	101	102	103	103	103

Students, ISCED 5B Vocational	Males	Education	5.8	6.1	6.5	6.3	6.3	6.3	6.6	100	106	112	109	109	109	114
		Humanities	7.9	8.0	8.3	8.2	8.4	8.5	8.3	100	102	105	104	108	109	106
		Business	38.0	38.4	38.8	39.2	39.3	39.1	40.3	100	101	102	103	103	103	106
		Science	21.6	22.0	22.8	23.3	24.1	24.2	23.9	100	102	105	108	112	112	111
		Engineering	60.6	60.1	60.1	61.5	62.0	61.8	62.0	100	99	99	102	102	102	102
		Agriculture	2.5	2.5	2.4	2.3	2.2	2.3	2.2	100	98	96	91	88	89	87
		Health	13.9	14.5	15.0	15.3	15.5	15.5	15.9	100	104	108	110	112	111	114
		Services	10.9	10.6	10.6	10.6	10.8	10.9	10.4	100	97	97	97	100	100	96
		Unknown	0.9	0.9	0.9	0.8	0.7	0.7	0.7	100	103	96	87	80	81	82
		Total	162.1	163.0	165.2	167.5	169.5	169.3	170.5	100	101	102	103	105	104	105
	Females	Education	21.9	22.2	22.1	21.3	21.2	21.2	21.2	100	101	101	97	97	97	97
		Humanities	9.9	10.0	10.3	10.4	10.7	10.7	10.4	100	100	104	104	107	108	105
		Business	82.0	82.4	82.8	84.3	85.0	84.4	85.5	100	100	101	103	104	103	104
		Science	6.8	6.7	6.8	6.9	7.0	7.0	6.8	100	99	100	101	103	103	100
		Engineering	13.2	13.1	13.1	13.3	13.4	13.3	13.2	100	99	99	101	102	101	100
		Agriculture	1.6	1.6	1.5	1.4	1.4	1.4	1.4	100	98	95	89	87	88	87
		Health	68.1	68.7	69.1	68.8	68.2	67.8	69.1	100	101	102	101	100	100	102
		Services	16.6	16.2	16.2	16.4	16.9	16.9	16.2	100	97	97	99	101	102	97
		Unknown	1.0	1.1	1.1	1.0	1.0	1.0	1.0	100	107	105	99	95	96	99
		Total	221.2	221.9	223.0	223.7	224.8	223.8	224.8	100	100	101	101	102	101	102
	Total	Education	27.7	28.3	28.6	27.6	27.5	27.6	27.8	100	102	103	100	99	100	100
		Humanities	17.8	17.9	18.6	18.6	19.1	19.3	18.8	100	101	104	104	107	108	105
		Business	120.0	120.8	121.6	123.5	124.4	123.5	125.8	100	101	101	103	104	103	105
		Science	28.4	28.7	29.6	30.2	31.1	31.2	30.7	100	101	104	106	109	110	108
		Engineering	73.8	73.2	73.1	74.8	75.5	75.1	75.3	100	99	99	101	102	102	102
		Agriculture	4.1	4.1	4.0	3.7	3.6	3.7	3.6	100	98	96	90	88	88	87
		Health	82.0	83.2	84.1	84.0	83.7	83.4	85.0	100	101	103	102	102	102	104
		Services	27.5	26.8	26.7	27.0	27.7	27.8	26.6	100	97	97	98	101	101	97
		Unknown	1.9	2.0	1.9	1.8	1.7	1.7	1.8	100	105	101	93	88	89	91
		Total	383.3	384.9	388.3	391.2	394.3	393.1	395.3	100	100	101	102	103	103	103

Figure C13: Projected number of students in prevocational and vocational streams by ISCED level, EU-27, 2005-50, baseline variant/increased vocational education participation

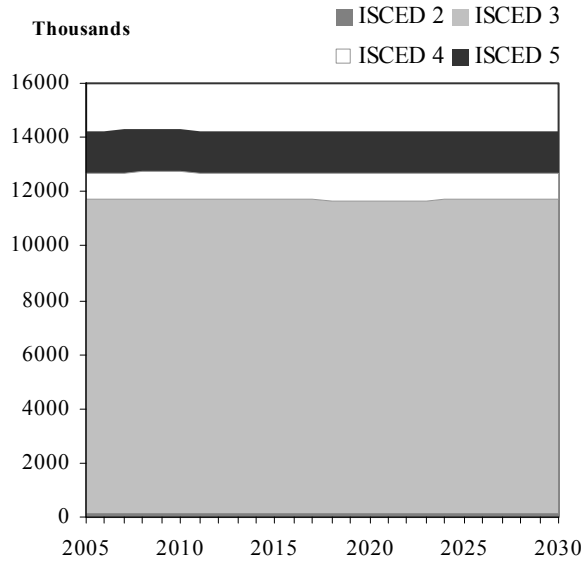


Figure C14: Percentage of students in prevocational and vocational streams by ISCED level, EU-27, 2005-50, baseline variant/increased vocational education participation

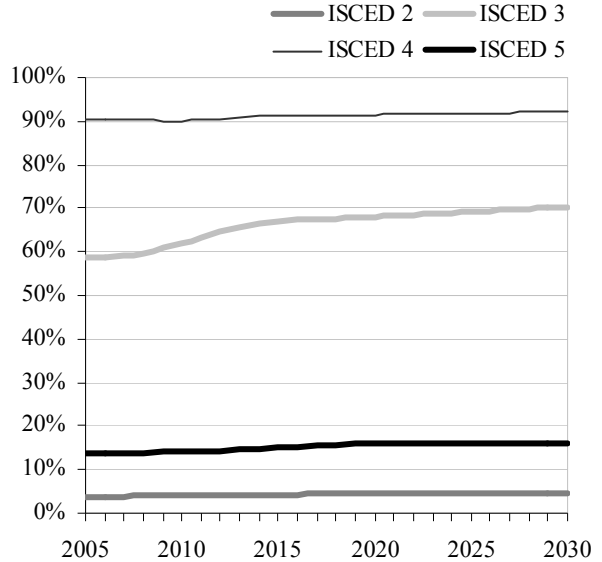


Figure C15: Projected number of VET graduates by ISCED level, EU-27, 2005-50, baseline variant/increased vocational education participation/constant graduation rates

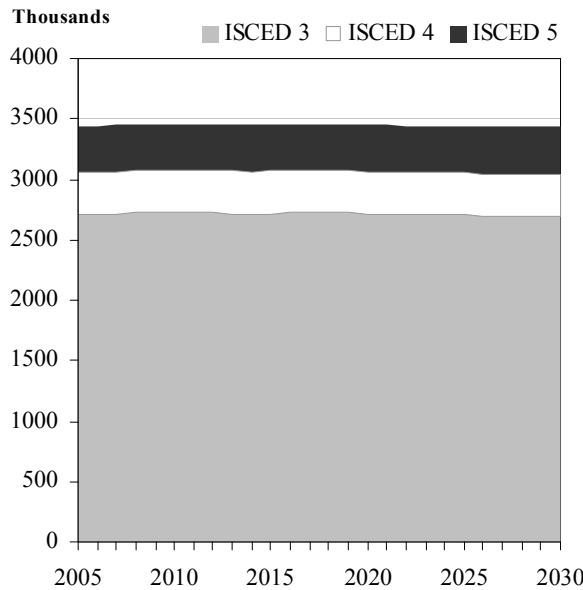
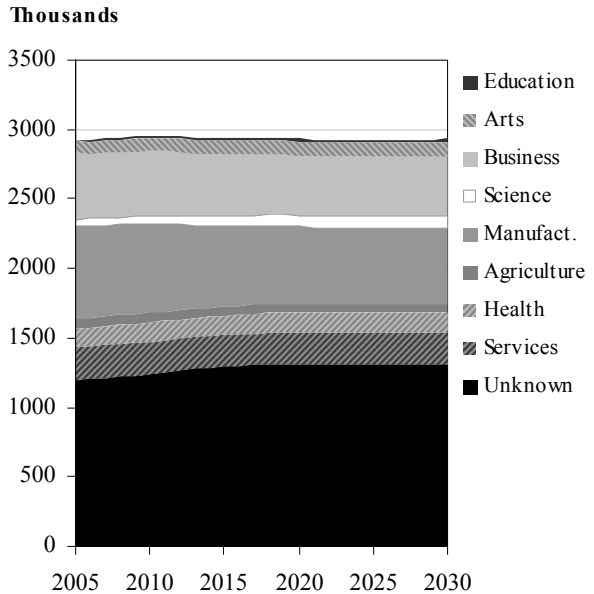


Figure C16: Projected number of VET graduates, ISCED 3, by field of education, EU-27, 2005-50, baseline variant/increased vocational education participation/constant graduation rates



Students, ISCED 4 Total	Males	15-19	194.6	194.7	189.2	194.1	198.6	197.9	195.8	100	100	97	100	102	102	101
		20-24	345.8	345.8	347.2	340.3	337.0	341.5	344.9	100	100	98	98	97	99	100
		Total	540.4	540.5	536.4	534.4	535.6	539.4	540.8	100	100	99	99	99	100	100
	Females	15-19	214.3	213.5	207.8	213.3	217.4	216.3	213.4	100	100	97	100	101	101	100
		20-24	345.1	344.1	344.8	337.9	334.4	337.6	340.1	100	100	98	98	97	98	99
		Total	559.4	557.6	552.6	551.2	551.7	553.9	553.6	100	100	99	99	99	99	99
	Total	15-19	408.8	408.2	397.0	407.4	416.0	414.2	409.2	100	100	97	100	102	101	100
		20-24	691.0	689.9	692.0	678.2	671.4	679.1	685.1	100	100	98	98	97	98	99
		Total	1099.8	1098.1	1089.0	1085.6	1087.4	1093.3	1094.3	100	100	99	99	99	99	100
Students, ISCED 4 Vocational	Males	15-19	175.9	176.2	172.7	177.7	181.6	180.0	177.9	100	100	98	101	103	102	101
		20-24	312.4	312.9	316.7	311.4	307.8	310.2	313.1	100	100	101	100	99	99	100
		Total	488.3	489.1	489.5	489.2	489.4	490.2	491.0	100	100	100	100	100	100	101
	Females	15-19	194.5	194.0	190.4	196.0	199.5	197.4	194.6	100	100	98	101	103	102	100
		20-24	311.3	310.9	314.1	308.8	305.0	306.3	308.3	100	100	101	99	98	98	99
		Total	505.7	504.9	504.5	504.8	504.5	503.7	502.9	100	100	100	100	100	100	99
	Total	15-19	370.4	370.2	363.2	373.7	381.1	377.4	372.6	100	100	98	101	103	102	101
		20-24	623.6	623.8	630.8	620.2	612.8	616.5	621.4	100	100	101	99	98	99	100
		Total	994.0	994.0	994.0	993.9	993.9	993.9	994.0	100	100	100	100	100	100	100
Students, ISCED 5 Total	Males	15-19	1135.0	1118.8	1021.1	1020.4	1064.3	1107.2	1101.0	100	99	90	90	94	98	97
		20-24	3960.4	3886.5	3688.2	3469.7	3471.1	3681.2	3775.2	100	98	93	88	88	93	95
		Total	5095.4	5005.4	4709.2	4490.0	4535.4	4788.5	4876.2	100	98	92	88	89	94	96
	Females	15-19	1606.1	1579.1	1440.8	1441.2	1494.7	1553.7	1541.3	100	98	90	90	93	97	96
		20-24	4747.9	4641.8	4390.9	4138.8	4142.6	4376.7	4470.5	100	98	92	87	87	92	94
		Total	6354.0	6220.9	5831.7	5580.0	5637.3	5930.3	6011.8	100	98	92	88	89	93	95
	Total	15-19	2741.1	2698.0	2461.8	2461.5	2558.9	2660.9	2642.3	100	98	90	90	93	97	96
		20-24	8708.3	8528.3	8079.1	7608.5	7613.7	8057.9	8245.7	100	98	93	87	87	93	95
		Total	11449.4	11226.3	10540.9	10070.0	10172.7	10718.8	10888.0	100	98	92	88	89	94	95
Students, ISCED 5 Vocational	Males	15-19	213.4	213.7	208.7	215.7	221.7	219.7	216.4	100	100	98	101	104	103	101
		20-24	458.2	459.1	465.3	457.4	451.7	454.7	459.5	100	100	102	100	99	99	100
		Total	671.6	672.8	674.0	673.1	673.4	674.4	675.9	100	100	100	100	100	100	101
	Females	15-19	303.1	302.7	295.7	305.8	312.7	309.6	304.1	100	100	98	101	103	102	100
		20-24	584.2	583.5	589.3	580.1	572.9	574.9	578.8	100	100	101	99	98	98	99
		Total	887.3	886.1	884.9	885.8	885.5	884.5	883.0	100	100	100	100	100	100	100
	Total	15-19	516.5	516.4	504.4	521.5	534.4	529.3	520.6	100	100	98	101	103	102	101
		20-24	1042.5	1042.6	1054.5	1037.4	1024.6	1029.6	1038.4	100	100	101	100	98	99	100
		Total	1558.9	1559.0	1558.9	1558.9	1558.9	1558.9	1558.9	100	100	100	100	100	100	100

Table C14: Projected number of VET graduates, ISCED 3-5, by gender and age group, EU-27, 2005-50, high population variant/increased vocational education participation/constant graduation rates

		Age group	(000s)							2005=100						
			2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050
Students, ISCED 3 Prevocational	Males	15-19	114.6	119.3	115.0	113.0	113.1	115.0	116.1	100	104	100	99	99	100	101
		20-24	13.6	14.7	14.3	13.7	13.1	13.4	13.6	100	108	105	100	96	98	100
		Total	128.2	134.1	129.3	126.6	126.2	128.4	129.7	100	105	101	99	98	100	101
	Females	15-19	86.4	89.3	86.8	85.6	85.5	86.7	87.2	100	103	100	99	99	100	101
		20-24	6.0	6.5	6.3	6.0	5.8	5.9	5.9	100	108	105	100	95	97	98
		Total	92.5	95.8	93.1	91.7	91.2	92.6	93.1	100	104	101	99	99	100	101
	Total	15-19	201.1	208.7	201.8	198.6	198.6	201.8	203.3	100	104	100	99	99	100	101
		20-24	19.6	21.2	20.6	19.7	18.9	19.2	19.5	100	108	105	100	96	98	99
		Total	220.7	229.9	222.4	218.3	217.4	221.0	222.8	100	104	101	99	99	100	101
Students, ISCED 3 Vocational	Males	15-19	1235.7	1243.1	1239.5	1246.8	1254.3	1256.2	1267.1	100	101	100	101	102	102	103
		20-24	252.6	257.5	251.2	237.4	225.0	230.8	234.8	100	102	99	94	89	91	93
		Total	1488.2	1500.6	1490.7	1484.2	1479.4	1487.0	1501.9	100	101	100	100	99	100	101
	Females	15-19	1052.1	1057.2	1056.2	1062.6	1061.1	1060.5	1062.4	100	100	100	101	101	101	101
		20-24	172.1	175.6	170.7	162.9	154.1	156.5	157.7	100	102	99	95	90	91	92
		Total	1224.2	1232.8	1226.9	1225.6	1215.3	1217.0	1220.2	100	101	100	100	99	99	100
	Total	15-19	2287.8	2300.3	2295.7	2309.5	2315.5	2316.6	2329.5	100	101	100	101	101	101	102
		20-24	424.7	433.2	421.9	400.3	379.2	387.3	392.5	100	102	99	94	89	91	92
		Total	2712.5	2733.5	2717.6	2709.8	2694.6	2704.0	2722.1	100	101	100	100	99	100	100
Students, ISCED 4 Vocational	Males	15-19	60.0	60.8	60.2	62.1	63.6	62.9	62.6	100	101	100	104	106	105	104
		20-24	105.9	106.7	107.8	104.5	102.6	102.9	104.1	100	101	102	99	97	97	98
		Total	165.9	167.5	168.0	166.6	166.2	165.9	166.7	100	101	101	100	100	100	100
	Females	15-19	63.6	64.3	63.7	65.5	66.9	66.1	65.6	100	101	100	103	105	104	103
		20-24	119.9	118.0	118.7	114.7	113.2	113.7	113.9	100	98	99	96	94	95	95
		Total	183.5	182.3	182.4	180.2	180.0	179.8	179.5	100	99	99	98	98	98	98
	Total	15-19	123.6	125.2	123.8	127.6	130.4	129.0	128.2	100	101	100	103	106	104	104
		20-24	225.8	224.6	226.5	219.1	215.8	216.6	217.9	100	100	100	97	96	96	97
		Total	349.3	349.8	350.4	346.8	346.3	345.6	346.2	100	100	100	99	99	99	99
Students, ISCED 5B Vocational	Males	15-19	51.5	51.9	51.3	53.6	55.0	54.3	54.1	100	101	100	104	107	105	105
		20-24	110.8	112.3	114.4	113.8	113.2	113.7	115.3	100	101	103	103	102	103	104
		Total	162.3	164.2	165.7	167.4	168.2	167.9	169.4	100	101	102	103	104	103	104
	Females	15-19	65.3	64.8	64.6	67.9	69.9	68.8	68.2	100	99	99	104	107	105	105
		20-24	156.4	156.6	158.8	156.7	156.4	156.8	158.2	100	100	102	100	100	100	101
		Total	221.6	221.4	223.4	224.7	226.3	225.7	226.5	100	100	101	101	102	102	102
	Total	15-19	116.8	116.7	115.8	121.6	124.9	123.1	122.4	100	100	99	104	107	105	105
		20-24	267.1	268.9	273.2	270.5	269.6	270.5	273.5	100	101	102	101	101	101	102
		Total	384.0	385.6	389.1	392.1	394.5	393.6	395.9	100	100	101	102	103	103	103

Students, ISCED 5B Vocational	Males	Education	5.8	6.2	6.5	6.3	6.3	6.3	6.6	100	106	112	108	108	108	113
		Humanities	7.9	8.0	8.3	8.2	8.4	8.5	8.3	100	102	105	104	107	108	105
		Business	38.1	38.7	38.9	39.2	39.0	38.8	40.1	100	102	102	103	102	102	105
		Science	21.6	22.1	22.9	23.3	23.9	24.0	23.7	100	102	106	108	111	111	110
		Engineering	60.7	60.5	60.3	61.5	61.5	61.3	61.6	100	100	99	101	101	101	102
		Agriculture	2.5	2.5	2.4	2.3	2.2	2.2	2.2	100	99	96	91	87	88	86
		Health	13.9	14.6	15.0	15.2	15.4	15.4	15.8	100	104	108	109	111	110	113
		Services	10.9	10.7	10.6	10.6	10.7	10.8	10.4	100	98	97	97	99	99	95
		Unknown	0.9	0.9	0.9	0.8	0.7	0.7	0.7	100	104	96	87	79	80	81
		Total	162.3	164.2	165.7	167.4	168.2	167.9	169.4	100	101	102	103	104	103	104
	Females	Education	21.9	22.1	22.1	21.4	21.3	21.4	21.4	100	101	101	98	97	98	97
		Humanities	10.0	9.9	10.3	10.4	10.7	10.8	10.5	100	100	104	104	108	109	105
		Business	82.2	82.2	82.9	84.6	85.6	85.1	86.1	100	100	101	103	104	104	105
		Science	6.8	6.7	6.8	6.9	7.1	7.1	6.9	100	99	100	101	103	104	101
		Engineering	13.2	13.1	13.1	13.4	13.5	13.5	13.3	100	99	99	101	102	102	101
		Agriculture	1.6	1.6	1.5	1.4	1.4	1.4	1.4	100	97	95	89	87	89	87
		Health	68.2	68.6	69.3	69.1	68.7	68.4	69.6	100	101	102	101	101	100	102
		Services	16.7	16.1	16.2	16.5	17.0	17.0	16.3	100	97	97	99	102	102	98
		Unknown	1.0	1.1	1.1	1.0	1.0	1.0	1.0	100	106	105	99	95	96	100
		Total	221.6	221.4	223.4	224.7	226.3	225.7	226.5	100	100	101	101	102	102	102
	Total	Education	27.7	28.3	28.6	27.7	27.6	27.7	27.9	100	102	103	100	100	100	101
		Humanities	17.8	18.0	18.6	18.6	19.1	19.3	18.8	100	101	104	104	107	108	105
		Business	120.2	120.9	121.9	123.9	124.6	123.9	126.1	100	101	101	103	104	103	105
		Science	28.5	28.9	29.7	30.2	31.0	31.1	30.6	100	101	104	106	109	109	108
		Engineering	73.9	73.6	73.3	74.9	75.1	74.7	75.0	100	100	99	101	102	101	101
		Agriculture	4.2	4.1	4.0	3.8	3.6	3.7	3.6	100	98	96	90	87	88	87
		Health	82.1	83.1	84.3	84.3	84.1	83.8	85.4	100	101	103	103	102	102	104
		Services	27.5	26.8	26.8	27.0	27.7	27.8	26.7	100	97	97	98	101	101	97
		Unknown	1.9	2.0	1.9	1.8	1.7	1.7	1.8	100	105	101	93	88	89	91
		Total	384.0	385.6	389.1	392.1	394.5	393.6	395.9	100	100	101	102	103	103	103

Figure C17: Projected number of students in prevocational and vocational streams by ISCED level, EU-27, 2005-30, high population variant/increased vocational education participation

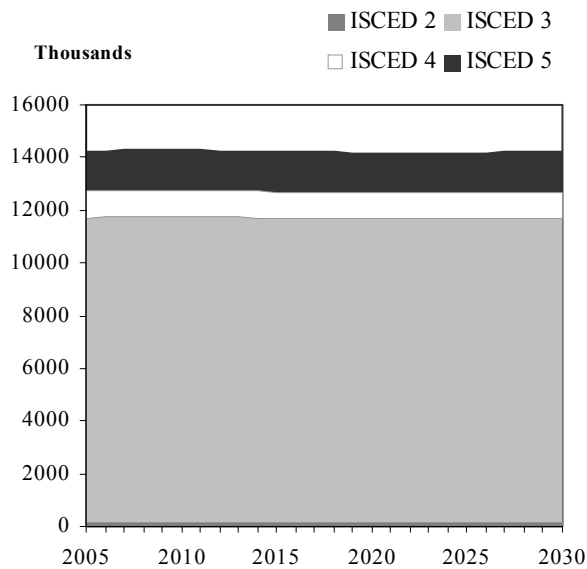


Figure C18: Percentage of students in prevocational and vocational streams by ISCED level, EU-27, 2005-30, high population variant/increased vocational education participation

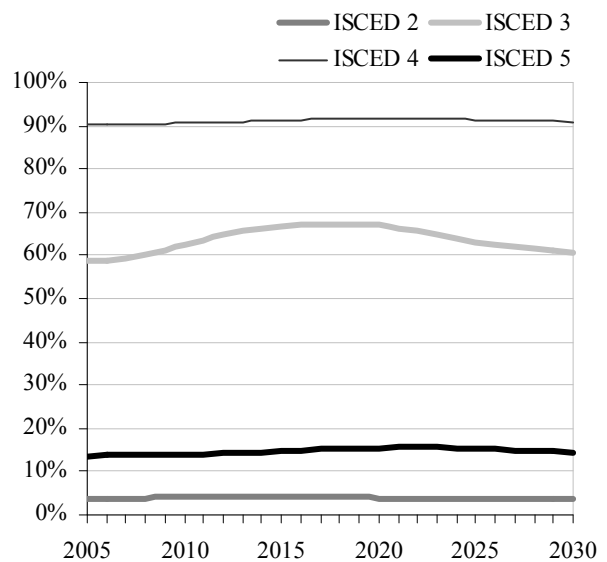


Figure C19: Projected number of VET graduates by ISCED level, EU-27, 2005-30, high population variant/increased vocational education participation/constant graduation rates

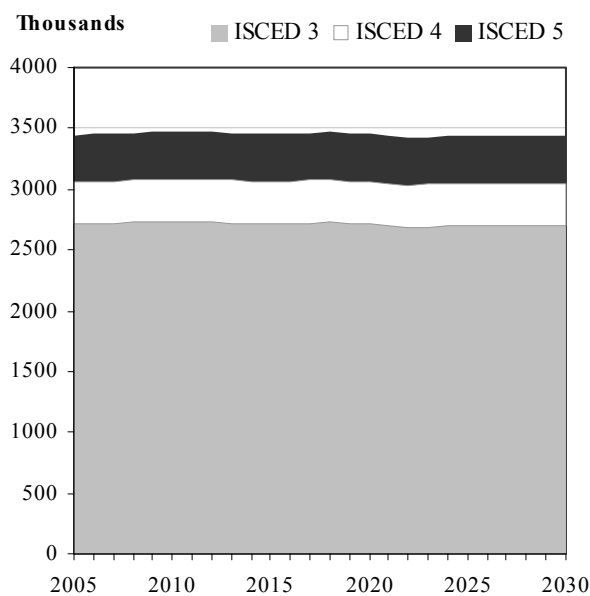
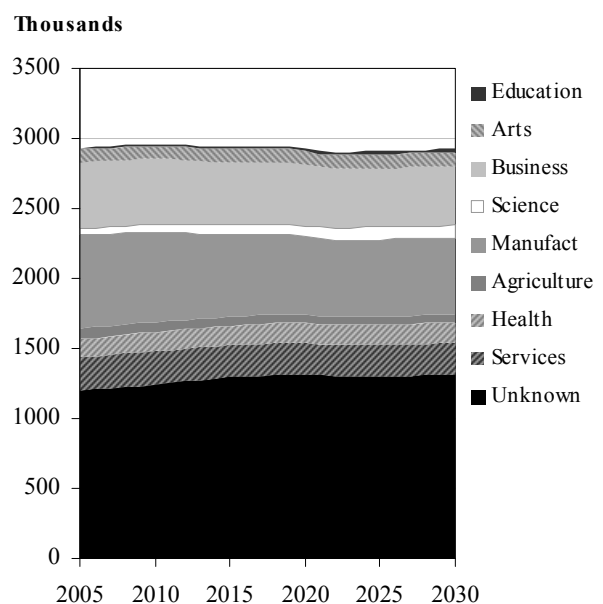


Figure C20: Projected number of VET graduates, ISCED 3, by field of education, EU-27, 2005-30, high population variant/increased vocational education participation/constant graduation rates



Students, ISCED 4 Total	Males	15-19	194.0	194.2	188.6	193.4	187.7	187.6	186.7	100	100	97	100	97	97	96
		20-24	344.8	344.3	345.0	337.7	343.0	340.2	333.8	100	100	100	98	99	99	97
		Total	538.8	538.5	533.5	531.1	530.7	527.8	520.5	100	100	99	99	98	98	97
	Females	15-19	213.6	213.1	207.4	212.8	205.1	204.9	203.7	100	100	97	100	96	96	95
		20-24	343.8	341.5	342.0	334.8	339.1	334.9	328.0	100	99	99	97	99	97	95
		Total	557.4	554.6	549.5	547.6	544.2	539.7	531.7	100	100	99	98	98	97	95
	Total	15-19	407.6	407.3	396.0	406.3	392.8	392.5	390.5	100	100	97	100	96	96	96
		20-24	688.6	685.8	687.0	672.5	682.1	675.0	661.7	100	100	100	98	99	98	96
		Total	1096.2	1093.1	1083.0	1078.8	1074.9	1067.5	1052.2	100	100	99	98	98	97	96
Students, ISCED 4 Vocational	Males	15-19	175.4	176.1	172.6	177.7	173.0	174.1	175.9	100	100	98	101	99	99	100
		20-24	311.4	311.9	315.4	310.0	316.0	315.6	314.1	100	100	101	100	101	101	101
		Total	486.8	488.0	488.0	487.7	489.1	489.7	490.0	100	100	100	100	100	101	101
	Females	15-19	193.8	193.8	190.5	196.1	189.7	190.7	192.3	100	100	98	101	98	98	99
		20-24	310.1	309.0	312.3	306.9	312.0	310.3	308.4	100	100	101	99	101	100	99
		Total	503.9	502.8	502.8	503.1	501.7	501.0	500.7	100	100	100	100	100	99	99
	Total	15-19	369.3	369.9	363.0	373.8	362.7	364.9	368.2	100	100	98	101	98	99	100
		20-24	621.5	620.9	627.7	616.9	628.1	625.9	622.6	100	100	101	99	101	101	100
		Total	990.7	990.8	990.7	990.7	990.8	990.8	990.7	100	100	100	100	100	100	100
Students, ISCED 5 Total	Males	15-19	1132.0	1105.6	999.8	991.7	932.1	873.6	750.3	100	98	88	88	82	77	66
		20-24	3947.2	3824.6	3588.1	3339.7	3281.2	3043.8	2508.5	100	97	91	85	83	77	64
		Total	5079.2	4930.2	4587.9	4331.4	4213.2	3917.4	3258.8	100	97	90	85	83	77	64
	Females	15-19	1600.8	1560.6	1412.6	1402.6	1309.3	1225.9	1051.2	100	97	88	88	82	77	66
		20-24	4729.7	4554.4	4264.9	3979.0	3903.0	3602.9	2973.3	100	96	90	84	83	76	63
		Total	6330.5	6115.0	5677.5	5381.6	5212.3	4828.8	4024.6	100	97	90	85	82	76	64
	Total	15-19	2732.9	2666.2	2412.4	2394.3	2241.4	2099.5	1801.6	100	98	88	88	82	77	66
		20-24	8676.9	8379.0	7852.9	7318.7	7184.2	6646.7	5481.8	100	97	91	84	83	77	63
		Total	11409.7	11045.2	10265.3	9713.0	9425.5	8746.2	7283.3	100	97	90	85	83	77	64
Students, ISCED 5 Vocational	Males	15-19	212.8	213.6	208.7	215.9	209.7	210.8	213.5	100	100	98	101	99	99	100
		20-24	456.8	457.6	463.3	455.1	463.2	463.4	461.1	100	100	101	100	101	101	101
		Total	669.6	671.2	671.9	670.9	672.9	674.3	674.6	100	100	100	100	101	101	101
	Females	15-19	302.1	302.6	296.0	306.5	295.6	296.9	300.2	100	100	98	101	98	98	99
		20-24	582.0	579.9	585.8	576.3	585.2	582.4	578.9	100	100	101	99	101	100	99
		Total	884.1	882.5	881.8	882.8	880.8	879.3	879.1	100	100	100	100	100	99	99
	Total	15-19	514.9	516.2	504.6	522.3	505.3	507.7	513.7	100	100	98	101	98	99	100
		20-24	1038.7	1037.5	1049.1	1031.4	1048.4	1045.9	1040.0	100	100	101	99	101	101	100
		Total	1553.7	1553.7	1553.7	1553.7	1553.7	1553.6	1553.7	100	100	100	100	100	100	100

Table C17: Projected number of VET graduates, ISCED 3-5, by gender and age group, EU-27, 2005-50, low population variant/increased vocational education participation/constant graduation rates

			(000s)							2005=100						
		Age group	2005	2010	2015	2020	2025	2030	2050	2005	2010	2015	2020	2025	2030	2050
Students, ISCED 3 Prevocational	Males	15-19	114.3	118.9	114.4	115.5	117.3	117.4	118.2	100	104	100	101	103	103	103
		20-24	13.6	14.6	14.2	13.9	14.8	14.4	14.1	100	108	104	103	109	106	104
		Total	127.9	133.5	128.6	129.5	132.1	131.7	132.3	100	104	101	101	103	103	103
	Females	15-19	86.2	89.1	86.5	87.7	88.4	88.3	88.7	100	103	100	102	103	102	103
		20-24	6.0	6.4	6.3	6.1	6.5	6.3	6.2	100	107	104	102	108	105	103
		Total	92.2	95.5	92.8	93.9	94.9	94.6	94.9	100	104	101	102	103	103	103
	Total	15-19	200.5	208.0	201.0	203.3	205.7	205.7	206.9	100	104	100	101	103	103	103
		20-24	19.6	21.1	20.4	20.1	21.3	20.7	20.3	100	108	104	102	109	106	104
		Total	220.1	229.0	221.4	223.3	227.0	226.4	227.2	100	104	101	101	103	103	103
Students, ISCED 3 Vocational	Males	15-19	1232.6	1239.4	1235.2	1254.7	1252.9	1252.0	1144.6	100	101	100	102	102	102	93
		20-24	251.8	255.9	249.0	238.6	251.1	247.9	221.0	100	102	99	95	100	98	88
		Total	1484.4	1495.4	1484.2	1493.4	1503.9	1499.8	1365.6	100	101	100	101	101	101	92
	Females	15-19	1049.3	1055.4	1054.9	1071.3	1060.1	1057.6	1064.2	100	101	101	102	101	101	101
		20-24	171.5	174.1	168.9	163.5	171.7	167.9	159.4	100	102	98	95	100	98	93
		Total	1220.8	1229.5	1223.8	1234.8	1231.9	1225.5	1223.5	100	101	100	101	101	100	100
	Total	15-19	2281.9	2294.8	2290.1	2326.1	2313.0	2309.6	2208.8	100	101	100	102	101	101	97
		20-24	423.2	430.0	417.9	402.1	422.8	415.8	380.3	100	102	99	95	100	98	90
		Total	2705.1	2724.8	2708.0	2728.2	2735.8	2725.4	2589.1	100	101	100	101	101	101	96
Students, ISCED 4 Vocational	Males	15-19	59.8	60.8	60.1	62.1	60.4	60.8	61.8	100	102	101	104	101	102	103
		20-24	105.6	106.3	107.3	104.0	105.3	104.7	104.4	100	101	102	99	100	99	99
		Total	165.4	167.1	167.5	166.1	165.8	165.5	166.3	100	101	101	100	100	100	101
	Females	15-19	63.4	64.3	63.7	65.6	63.4	63.8	64.8	100	101	100	104	100	101	102
		20-24	119.4	117.2	118.0	113.9	115.9	115.4	113.9	100	98	99	95	97	97	95
		Total	182.8	181.5	181.7	179.5	179.3	179.2	178.7	100	99	99	98	98	98	98
	Total	15-19	123.2	125.1	123.8	127.7	123.9	124.5	126.7	100	102	100	104	101	101	103
		20-24	225.0	223.6	225.4	217.9	221.2	220.1	218.3	100	99	100	97	98	98	97
		Total	348.2	348.6	349.2	345.7	345.1	344.7	345.0	100	100	100	99	99	99	99
Students, ISCED 5B Vocational	Males	15-19	51.4	51.9	51.3	53.7	52.1	52.1	53.4	100	101	100	104	101	101	104
		20-24	110.4	112.0	113.9	113.2	116.0	115.6	115.7	100	101	103	103	105	105	105
		Total	161.8	163.8	165.2	166.9	168.1	167.7	169.1	100	101	102	103	104	104	104
	Females	15-19	65.1	64.8	64.6	68.1	66.1	66.1	67.4	100	100	99	105	102	102	104
		20-24	155.8	155.6	157.9	155.7	159.9	158.9	158.2	100	100	101	100	103	102	102
		Total	220.8	220.4	222.5	223.8	226.0	225.0	225.6	100	100	101	101	102	102	102
	Total	15-19	116.5	116.7	115.9	121.7	118.3	118.2	120.8	100	100	100	105	102	101	104
		20-24	266.2	267.6	271.8	269.0	275.9	274.5	273.9	100	101	102	101	104	103	103
		Total	382.7	384.3	387.7	390.7	394.1	392.7	394.7	100	100	101	102	103	103	103

Students, ISCED 5B Vocational	Males	Education	5.8	6.2	6.5	6.3	6.3	6.3	6.6	100	106	112	108	108	108	113
		Humanities	7.8	8.0	8.2	8.2	8.4	8.5	8.3	100	102	105	104	107	108	106
		Business	38.0	38.6	38.8	39.1	39.0	38.7	40.0	100	102	102	103	103	102	105
		Science	21.6	22.1	22.8	23.2	23.9	24.0	23.7	100	102	106	108	111	111	110
		Engineering	60.5	60.4	60.1	61.3	61.5	61.2	61.5	100	100	99	101	102	101	102
		Agriculture	2.5	2.5	2.4	2.3	2.2	2.2	2.2	100	99	96	91	88	88	86
		Health	13.9	14.5	15.0	15.2	15.4	15.4	15.8	100	105	108	109	111	111	114
		Services	10.8	10.6	10.6	10.5	10.7	10.8	10.4	100	98	97	97	99	100	96
		Unknown	0.9	0.9	0.9	0.8	0.7	0.7	0.7	100	104	96	87	80	80	81
		Total	161.8	163.8	165.2	166.9	168.1	167.7	169.1	100	101	102	103	104	104	104
	Females	Education	21.9	22.0	22.0	21.3	21.3	21.4	21.3	100	101	101	98	98	98	97
		Humanities	9.9	9.9	10.3	10.4	10.7	10.8	10.4	100	100	104	104	108	109	105
		Business	81.9	81.8	82.6	84.3	85.5	84.8	85.7	100	100	101	103	104	104	105
		Science	6.8	6.7	6.8	6.9	7.0	7.1	6.8	100	98	100	101	104	104	101
		Engineering	13.2	13.0	13.0	13.3	13.5	13.4	13.3	100	99	99	101	102	102	101
		Agriculture	1.6	1.6	1.5	1.4	1.4	1.4	1.4	100	97	95	89	87	89	87
		Health	67.9	68.3	69.0	68.8	68.6	68.2	69.4	100	100	102	101	101	100	102
		Services	16.6	16.1	16.1	16.4	17.0	17.0	16.2	100	97	97	99	102	102	98
		Unknown	1.0	1.1	1.1	1.0	1.0	1.0	1.0	100	106	105	99	96	96	100
		Total	220.8	220.4	222.5	223.8	226.0	225.0	225.6	100	100	101	101	102	102	102
	Total	Education	27.6	28.2	28.5	27.6	27.6	27.6	27.8	100	102	103	100	100	100	101
		Humanities	17.8	17.9	18.5	18.5	19.1	19.2	18.7	100	101	104	104	107	108	105
		Business	119.8	120.4	121.4	123.4	124.5	123.5	125.7	100	100	101	103	104	103	105
		Science	28.4	28.8	29.6	30.1	31.0	31.0	30.5	100	101	104	106	109	109	108
		Engineering	73.7	73.4	73.1	74.6	75.0	74.6	74.8	100	100	99	101	102	101	101
		Agriculture	4.1	4.1	4.0	3.7	3.6	3.7	3.6	100	98	96	90	87	88	87
		Health	81.8	82.8	84.0	84.0	84.0	83.6	85.1	100	101	103	103	103	102	104
		Services	27.4	26.7	26.7	26.9	27.7	27.8	26.6	100	97	97	98	101	101	97
		Unknown	1.9	2.0	1.9	1.8	1.7	1.7	1.7	100	105	101	93	88	89	91
		Total	382.7	384.3	387.7	390.7	394.1	392.7	394.7	100	100	101	102	103	103	103

Figure C21: Projected number of students in prevocational and vocational streams by ISCED level, EU-27, 2005-50, low population variant/increased vocational education participation

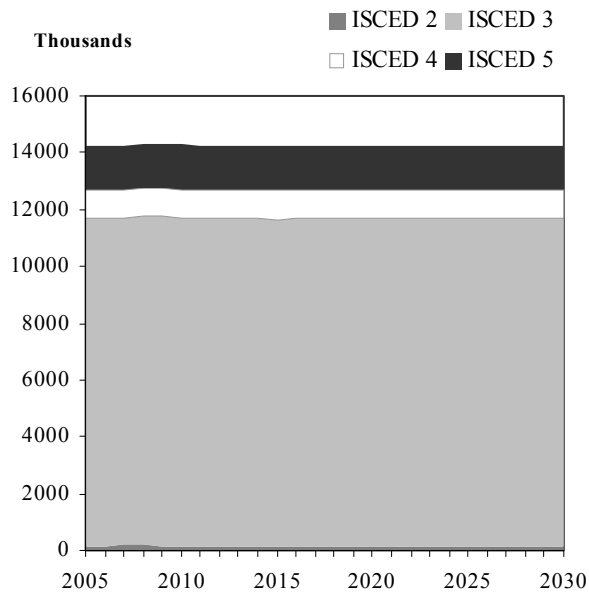


Figure C22: Percentage of students in prevocational and vocational streams by ISCED level, EU-27, 2005-50, low population variant/increased vocational education participation

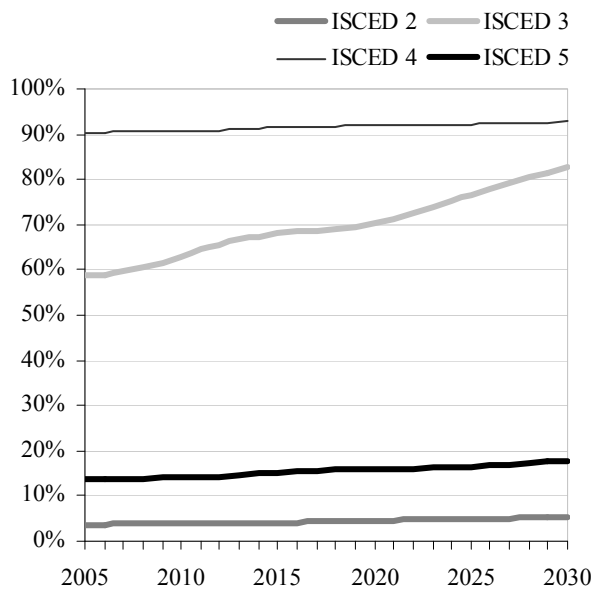


Figure C23: Projected number of VET graduates by ISCED level, EU-27, 2005-50, low population variant/ increased vocational education participation/constant graduation rates

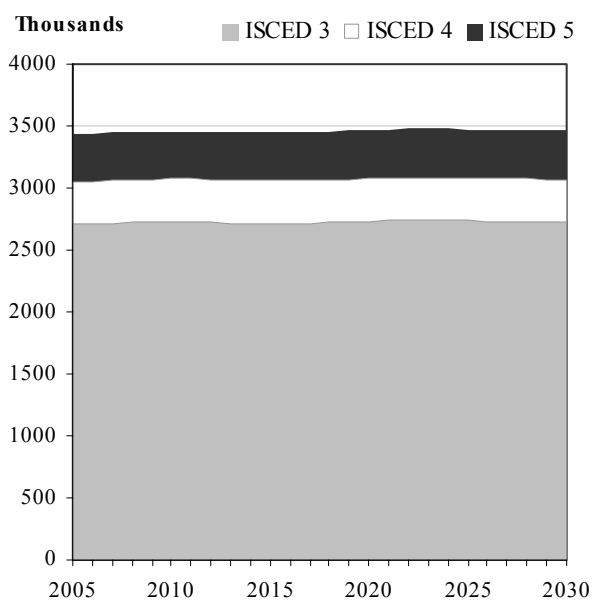
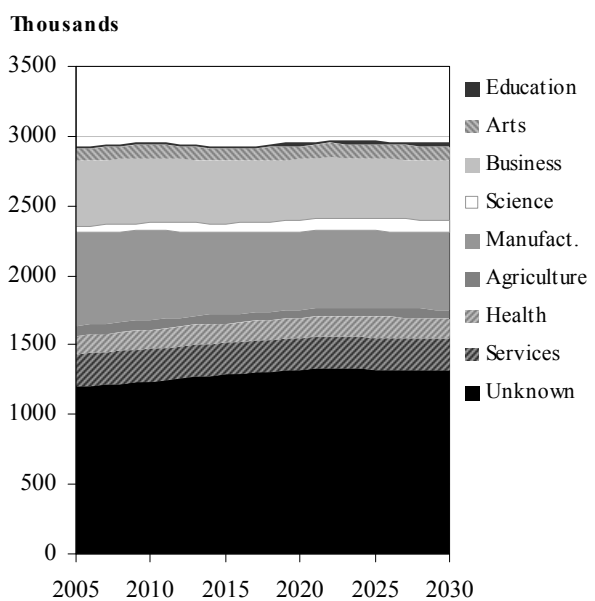


Figure C24: Projected number of VET graduates ISCED 3, by field of education, EU-27, 2005-50, low population variant//increased vocational education participation/constant graduation rates



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Implications of demographic change for vocational education and training in the EU

The report discusses the impact of demographic trends on vocational education and training (VET) in EU-27. It presents short-, medium- and long-term projections of the future number of VET students and graduates, for the period 2005-50 focusing on up to 2030. The analysis is based on the 2004 Eurostat population projections and centres on the cohorts aged 15-24.

Assuming constant participation and graduation rates, the number of young VET students, at secondary, post-secondary and tertiary level, is likely to fall by over two million and of graduates by around 600 000 between 2005 and 2030 (baseline scenario). At upper secondary level, the number of VET students is expected to decrease from 11.5 million to 9.6 million.

This projected decline will most likely affect demand for VET teachers and trainers and VET facilities. Fewer VET graduates may lead to labour-market shortages for people with VET qualifications.

Apart from posing a challenge, demographic change can also yield new opportunities. Potential (public) budget savings resulting from fewer VET students could be used to improve the quality and effectiveness of VET systems.



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