

# Northern Ireland Skills Barometer 2021



## Overview Report

This report seeks to summarise the key findings from the Northern Ireland Skills Barometer 2021.



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# Northern Ireland Skills Barometer 2021

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## Acronyms and Skills Classifications

### Acronyms

Acronym	Full title
NQF	National Qualification Framework
NI	Northern Ireland
DfE	Department for the Economy
UUEPC	Ulster University Economic Policy Centre
FE	Further Education
HE	Higher Education
SSA	Sector Subject Area
JACS	Joint Academic Coding System
HEI	Higher Education Institution
MaSN	Maximum Student Numbers
GB	Great Britain
NINo	National Insurance Number
SIC	Standard Industrial Classification
SOC	Standard Occupational Classification
CAGR	Compound Annual Growth Rate
NISRA	Northern Ireland Statistics and Research Agency
DWP	Department for Work and Pensions

### National Qualification Framework (NQF) Skills Classification

NQF level	Description
Level 8	PhD (or equivalent)
Level 7	Masters (or equivalent)
Level 6	Undergraduate degree (or equivalent)
Level 4-5	Foundation degree / HND / HNC (or equivalent)
Level 3	A-level (or equivalent)
Level 2	5 GCSEs A*-C (or equivalent)
Level 1	5 GCSEs D-G (or equivalent)
Level 0	Below NQF level 1 / no qualifications

# Skills Barometer

## high growth scenario

**73k**

jobs over the decade.

**25k**

jobs above the baseline

### Sector forecast

- Stronger growth in **10X** priority clusters.
- **Professional services** (10.9K - 24% increase).
- **Information & communication** (10.9K - 36% increase).
- Large staple sectors continue to generate significant job numbers (**Manufacturing** - 7.0K, **Health** - 8.1K).

### Occupation forecast

- **Science & technology professionals** will increase by 11% (8.8K).
- **Elementary administration and service occupations** will grow by 29% (8.8K).
- Demand for **lower skilled occupations** wanes (e.g. skilled agricultural trades, customer services).

## Demand for Education Leavers & Migrants

**28.7K**

vacancies p.a over the decade

**66%**

vacancies accounted for by replacement demand

**37%**

vacancies require at least degree level qualification

**8%**

vacancies require at below NQF level 2 qualification

## Graduate subjects

Medical related subjects (17% of total)

Business & finance studies (13% of total)

Maths and computer science (11% of total)

## Supply from the education system

**23.7k**

leave education system and enter the labour market p.a

**9%**

qualified to below NQF level 2 entering the labour market

**7%**

qualified to NQF level 4-5 entering the labour market

**47%**

qualified to NQF level 6+ entering the labour market

## Graduate subjects

Medical related subjects (18% of total)

Business and finance (14% of total)

Social studies (13% of total)

## (Im)balance

**Undersupply**



- NQF level 6+ qualifiers **-0.8K** p.a.
- NQF level 4-5 qualifiers **-1.9K** p.a.
- NQF level 3 qualifiers **-2.4K** p.a.

## Graduate subjects

Engineering & technology **-340**

Maths and computer science **-300**

Physical & environmental sciences **-300**

Social sciences **+400**

Education **+130**

Medicine and dentistry **+40**

**Oversupply**



- NQF level 2 **+0.6K** p.a.
- Below NQF level 2 **+0.3k** p.a.

## 1. Introduction

- 1.0. The Northern Ireland (NI) Skills Barometer was commissioned by the Department for the Economy (DfE) to provide a better understanding of the future skills needs across the NI economy. This iteration marks the fourth NI Skills Barometer publication from Ulster University Economic Policy Centre (UUEPC) since 2015.
- 1.1. The need to understand skills requirements and potential mismatches for the future economy has been accelerated by the events of the last 24 months. The future world of work has often been uncertain, but few would have predicted the shift in consumer behaviour and working patterns that have unfolded. These shifts, some new and others an acceleration of existing trends, bring job creation, job loss and importantly a **changing mix of skill requirements**.
- 1.2. **The pandemic has brought the importance of ‘soft skills’ to the fore.** Remote and blended working have challenged communication, independent working, digital competencies, adaptability, flexibility and much more within the labour market. Recent research by UUEPC<sup>1</sup> identified that over two-fifths of current jobs in NI could be undertaken either remotely or on a hybrid basis. Therefore, skills challenges that have emerged alongside remote working are likely to persist over the longer term. A recent employer survey from the CBI and Birkbeck Education<sup>2</sup> reported the most important factor in recruiting school and college leavers was ‘soft skills and attributes’ where 69% of employers reported this factor among their top three. This ranked significantly above the more traditional recruitment method of ‘qualifications’, where only 39% of employers ranked this among their top three most important factors.
- 1.3. However, the requirement for qualifications has not diminished. **Employers continue to favour higher qualified individuals, squeezing those with low or no qualifications out of the labour market.** This trend was exacerbated by the pandemic, as restrictions in the labour market had a more adverse effect on those individuals in roles requiring lower levels of qualification. In Q1 2020 individuals qualified to NQF level 2 or below accounted for 22% of total hours worked, declining to 15% by Q3 2021. Simultaneously, those qualified to degree level or above (i.e. NQF level 6+) increased from 32% of total hours worked to 41%.
- 1.4. The pandemic has also contributed to wider labour market change. **Restrictions on international travel have reduced migration flows.** National Insurance Number (NINo) registrations by non-UK nationals reduced considerably in 2020/21, contributing to labour shortages in occupations that have been more dependent upon migrant labour in recent years.
- 1.5. Restrictions on social activity have contributed to an accumulation of excess savings for many over the past two years, providing people with additional choice. **The proportion of early retirements is at its highest for almost a decade**, with many older workers affected by the pandemic deciding to retire early. The **number of**

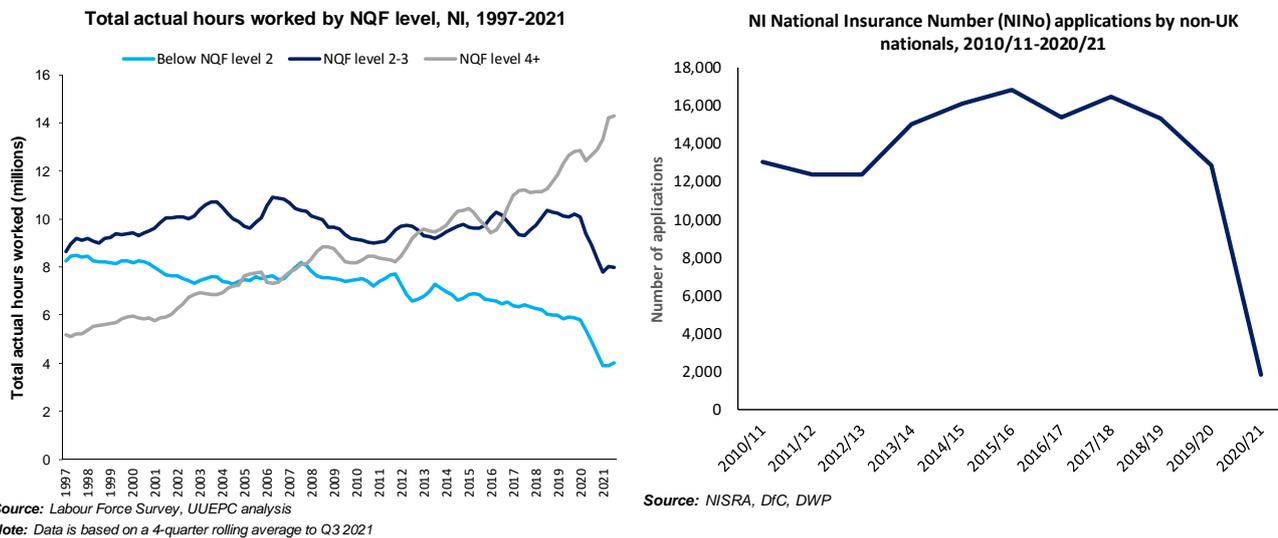
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<sup>1</sup> Magennis, E., Desmond, A. and Hetherington, G. (2022) The Future of Remote Working in NI. Available via: [https://www.ulster.ac.uk/data/assets/pdf\\_file/0011/1076762/UUEPC-Future-of-Remote-Working-in-NI-February-2022-Full-Report.pdf](https://www.ulster.ac.uk/data/assets/pdf_file/0011/1076762/UUEPC-Future-of-Remote-Working-in-NI-February-2022-Full-Report.pdf)

<sup>2</sup> CBI and Birkbeck Education (2021) ‘Skills for an Inclusive Economy’. Available via: [https://www.cbi.org.uk/media/7020/12684\\_tess\\_survey\\_2021.pdf](https://www.cbi.org.uk/media/7020/12684_tess_survey_2021.pdf)

**economically inactive students increased to levels not recorded in almost ten years**, as some students withdrew their labour and others suffered from a lack of opportunities during the pandemic.

**Figure 1.1: Total hours worked by qualification level (NQF), NI, 1997-2021 and NINo applications by non-UK nationals, NI, 2010/11-2020/21**



- 1.6. The education system is retaining young people for longer, with higher proportions of enrolling in higher level qualifications. In 2020 almost half (49%) of NI school leavers transitioned directly to Higher Education (HE). At post-primary school the proportion of school leavers achieving 5+ GCSE's A\*-C (including English and Maths) has increased significantly in the last decade, from half of leavers (50%) in 2004 to over three-quarters (76%) in 2020. The proportion of leavers with 3+ A-levels A\*-C has similarly increased from 27% to 52% over the same period. At HE achieving a second-class lower division and below is becoming more rare, falling from 45% of all qualifiers in 1997 to 15% 2020.
- 1.7. **Improved education attainment, although welcomed, creates short-term labour market supply pressures** as many students who previously would have exited the education system to enter the labour market are now retained to complete higher-level qualifications. The supply pressures are particularly visible amongst NQF level 3 and below qualifiers entering the labour market, a pressure exacerbated by a concurrent reduction in migrants. However, as a significant proportion of job creation continues to be driven by sectors that require highly qualified individuals, the extreme nature of current labour shortages remains a short-term phenomenon. A perfect storm created at a unique moment whereby low net migration, increased education retention, reduced student labour market participation and above trend levels of early retirement have coincided with heightened labour demand from a rapidly opening economy. Despite short-term labour pressures it is important to remain focussed on **long-term, NI strategic challenges for NI to develop and maintain an internationally competitive labour market.**
- 1.8. The labour market is demanding individuals with qualifications and for the most part, the education system is producing them. However, for a region to prosper in productivity, improve living standards and compete at a global level, the labour market

needs more. Employers demand individuals qualified to the appropriate level but also qualified within the relevant subject matter. They require these individuals not only to have accurate levels of qualifications within the correct field, but also with strong soft skills and recent relevant working experience. **Collaboratively the education system, employers and policy makers must work to develop a system that sufficiently prepares talented young people to prosper within the world of work.** This NI Skills Barometer research seeks to contribute to the evidence base to help inform this collaboration.

1.9. This summary report update of the NI Skills Barometer 2021 seeks to outline the demand for qualifications over the coming decade, provide an overview of the supply side trends and identify skills mismatches. The remainder of this report is structured as follows:

- **Northern Ireland Economic Model: High growth scenario** – This chapter outlines the underlying assumptions and outputs associated with the UUEPC economic forecasting model.
- **Demand side: Skills requirements for the future** - This section seeks to outline the expected labour demand in the NI economy over the coming decade.
- **Supply side: Qualifiers from education** - This chapter provides an overview of supply side information. This includes trends in school performance and Further Education (FE) and HE participation.
- **Supply side: Wider labour market considerations** - This provides an analysis of labour market qualifications, lifelong learning, demographic projections, migration and transversal skills.
- **Demand and Supply (im)balance** - This section seeks to combine the high growth demand and supply side analysis to identify areas of over and undersupply by NQF level and subjects balances at tertiary education.
- **Qualitative research** – This chapter provides a brief overview of high-level feedback from industry stakeholders relating to the education and skills challenges facing NI.
- **Summary and policy remarks** – This section summarises the key findings from the research and highlights the resulting policy challenges.
- **Annex A: Baseline** – This section provides a brief overview of NI Skills Barometer results under UUEPC's baseline scenario.

## 2. Northern Ireland Economic Model: High growth scenario

- 2.0. This section seeks to outline the underlying assumptions and outputs associated with the UUEPC economic forecasting model. The forecasts are used to identify future skills needs and requirements for NI over the coming decade.

### Introduction

- 2.1. UUEPC regularly produce economic forecasts for key indicators (e.g. jobs, GVA, inflation) under a range of scenarios (i.e. the lower scenario, the baseline scenario and the high growth scenario).
- 2.2. The lower scenario represents weaker economic conditions that are unlikely to happen (e.g. slower growth in jobs and GVA than historic trends would suggest). The forecasts under the baseline scenario are aligned to the most likely economic outcomes. Finally, the economic outcomes under the high growth scenario are aspirational and more closely aligned to NI achieving its economic ambitions (e.g. stronger growth in 10X cluster sectors<sup>3</sup>).
- 2.3. The NI Skills Barometer publishes the future skills needs and requirements for the NI economy under both baseline conditions and high growth conditions.

### Focusing on the high growth scenario

- 2.4. Whilst the results from the NI Skills Barometer are published under both scenarios **the focus remains on the outputs associated with the high growth scenario**. The Skills Barometer modelling focuses on the resulting (im)balance by qualification level (NQF) and subjects studied under a scenario where NI achieves its economic ambitions.
- 2.5. The approach of planning based on a high-growth scenario has been justified since the initial NI Skills Barometer publications as actual job growth has outperformed baseline forecasts. **It is reasonable to present the future skills needs and skills gaps under the high growth scenario as a shortage of skills can result in the eroding competitiveness of a region.**
- 2.6. In the event of an oversupply of skills associated with over ambition, contingencies should be in place to counterbalance any cost to the individual. For example, conversion courses and access to training in high demand sectors for education leavers unable to access work within their field of study.

### Assumptions under the high growth scenario

- 2.7. The NI employment rate has lagged behind that of the UK with an average 5 percentage point gap over the last two decades. The lag is predominantly associated with consistently higher levels of economic inactivity in NI. Therefore, one of the key aspirational ambitions under the high growth scenario is for the NI employment rate (currently 70%) to more closely align with the UK employment rate, currently 75%, by

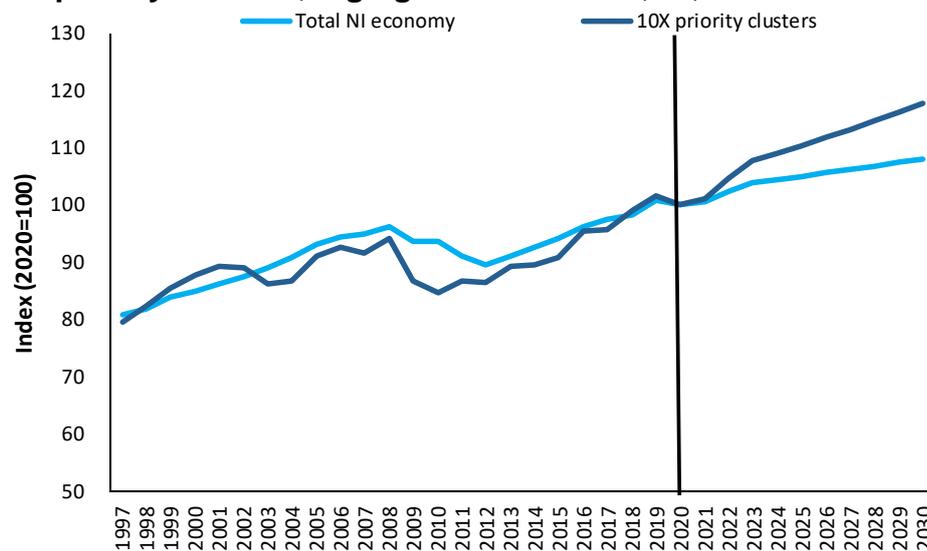
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<sup>3</sup> Digital, ICT and Creative Industries, Fintech / Financial Services, Life and Health Sciences, Advanced Manufacturing and Engineering and Agri-tech.

2030. **Closing the gap with the UK employment rate will require a significant reduction in the economic inactivity rate in NI**, proving highly ambitious.

- 2.8. The economic recovery from Covid-19 is now underway, the instruments to support the labour market during the downturn (i.e. Coronavirus Job Retention Scheme, Self-Employment Income Support Scheme) have come to an end. At the time of writing the high vaccination rate of the population has enabled the economy to reopen under limited restrictions. Although there remains much uncertainty on the future health and economic implications related to the pandemic, it is assumed that there will be no future lockdown measures or sector closures. **Under the high growth scenario the NI economy is expected to return to pre-pandemic levels of employment during 2022, supported by strong demand.**
- 2.9. The high growth scenario is also aligned to the ambitions included in the Department for the Economy (2021) 'A 10X Economy: Northern Ireland's Decade of Innovation'<sup>4</sup>. Stronger growth is expected within the priority clusters over the coming decade.

**Figure 2.1: Employment growth (2020=100), NI economy versus 10x priority clusters, high growth scenario, NI, 1997-2030<sup>5</sup>**



Source: UUEPC

### How many jobs will be created?

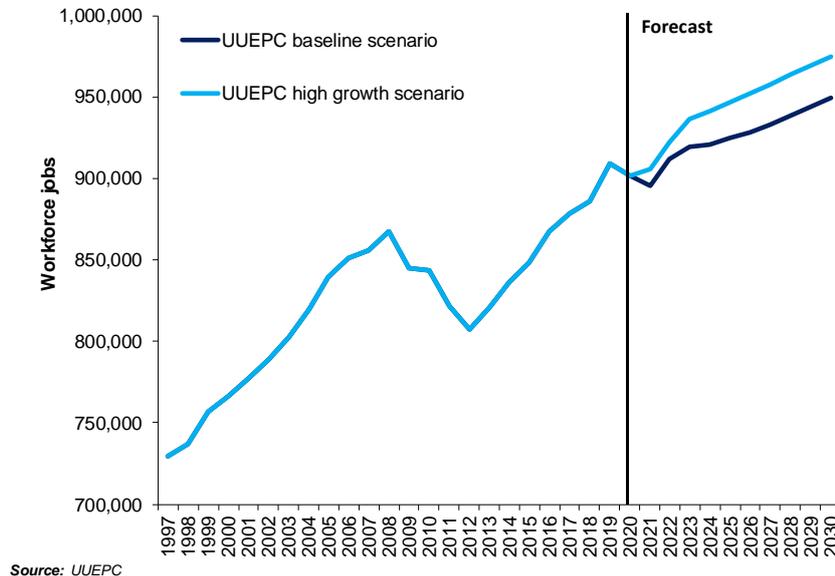
- 2.10. **The high growth scenario forecasts average employment growth of 7.3k jobs per annum over the ten-year period to 2030.** That is an annual average growth rate of 0.8%. Although the forecast is ambitious it remains below the actual annual average growth rate for the period 2012-2019 (1.7%) when the economy was creating 14.5k jobs per annum on average. The relatively slower growth can be attributed to a number of factors.
- 2.11. Firstly, **growth in the working age population is beginning to slow.** The decade to 2010 saw an increase of 107k in the working age population, from 2010 to 2020 the

<sup>4</sup> Department for the Economy (2021) 'A 10X Economy: Northern Ireland's Decade of Innovation' <https://www.economy-ni.gov.uk/publications/10x-economy-economic-vision-decade-innovation>

<sup>5</sup> The 10X priority clusters are difficult to define using SIC definitions. The analysis in Figure 2.1 is based upon a 'closest match' principle using 2 digit SIC codes.

increase was 14.5k and the coming decade is projected to be only 3k. Therefore, **the annual number of jobs created over the longer-term can be expected to be lower than the recent past.** Further, **the forecast period includes the year 2021**, where negative growth associated with Covid-19 will reduce the average annual job growth.

**Figure 2.2: Employment (jobs) by scenario, NI, 1997-2030**

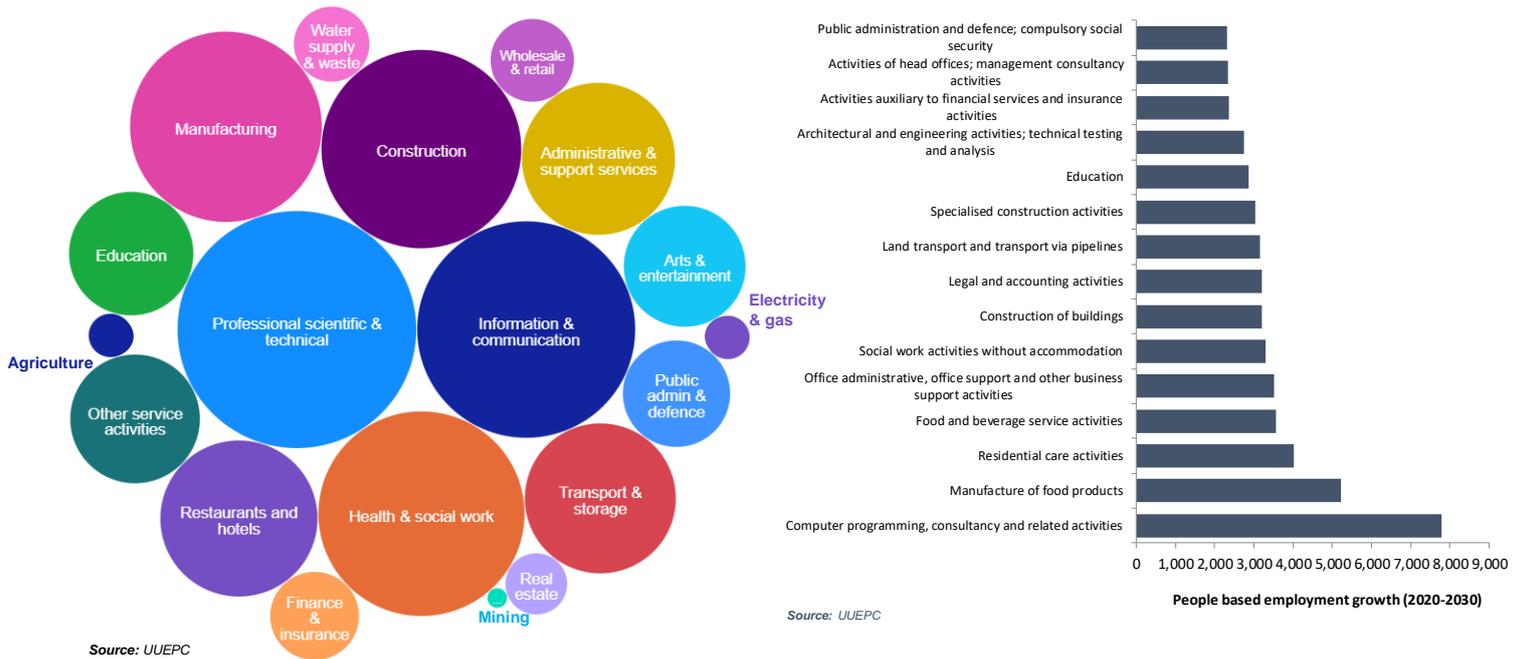


- 2.12. Overall, **the high growth scenario is expected to create 25k more jobs over the decade 2020-2030 than under baseline conditions.**

### How will sectors perform?

- 2.13. Under the high growth scenario an increase in employment is forecast across all sectors. In absolute terms, over the decade the largest growth is expected in the professional services sector (+10.9k) followed by the information and communication sector (+9.1k) and health and social work (+8.1k). However, the scale of the sector is noteworthy. For example, a 6% increase in the health sector generates twice as many jobs as a 20% increase in the finance and insurance sector, 8.6k and 4.1k respectively.

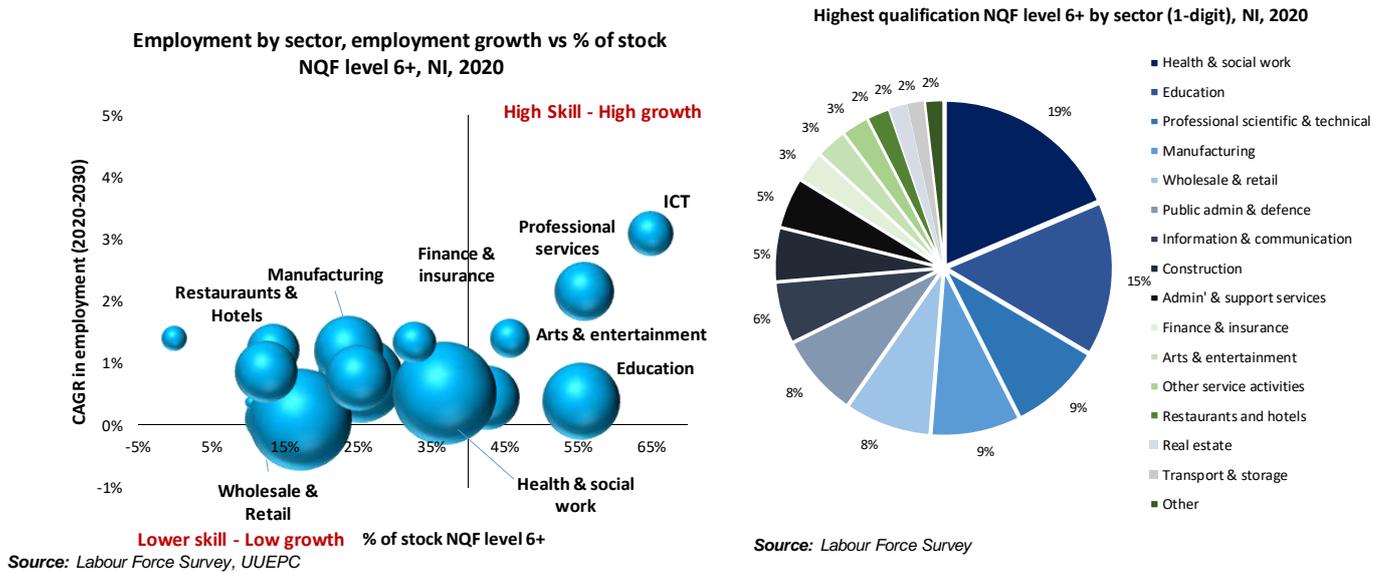
**Figure 2.3: Employment growth (size of bubble) by sector (1-digit) and top 15 (2-digit), NI, 2020-2030**



2.14. Importantly, **under high growth conditions higher growth rates are expected in sectors associated with higher qualification requirements** (i.e. degree level and above). That is, higher value added sectors generating high wage, high skill employment. This is significant in driving considerable demand for tertiary qualifiers within the NI Skills Barometer.

2.15. For example, the ICT sector is forecast to grow by 3.1% per annum over the coming decade, where 65% of people employed within the sector are qualified to degree level or above. Similarly, professional services is forecast to grow by 2.2% per annum over the decade and 56% of the workforce are qualified to at least degree level.

**Figure 2.4: Employment growth by sector and stock of NQF level 6+ qualifiers by sector, NI, 2020**



2.16. There are also larger sectors whereby a lower growth rate and lower proportion of overall degree level qualifiers still generates substantial demand for graduates due to the scale of the sector. For example, the manufacturing sector has a low proportion of overall degree level qualifiers (25%) but is one of the top four employers of degree level qualifiers. To put this in context, the manufacturing sector employs more degree level qualifiers (23k) than the ICT sector (16k) and roughly the same as the professional services sector (24k).

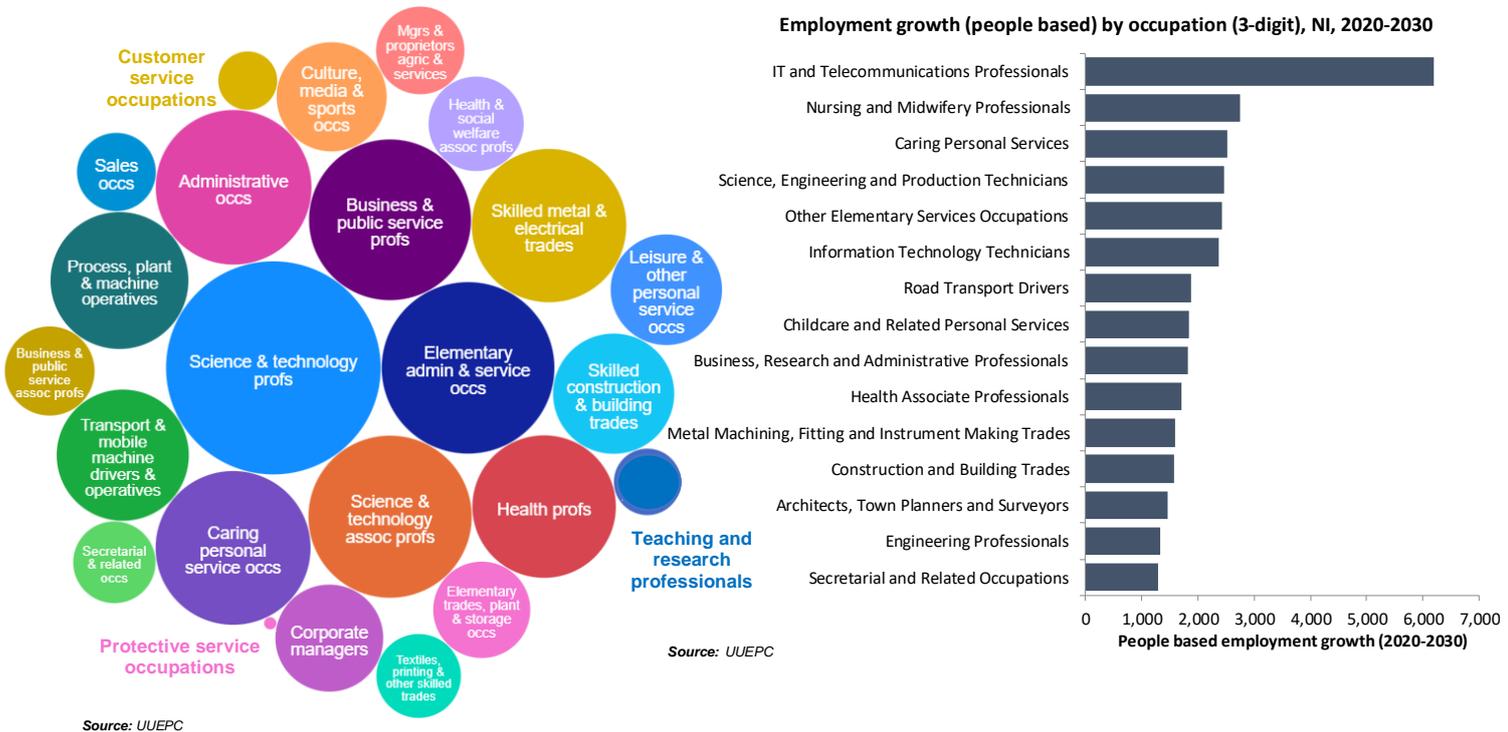
### How does this translate to occupations?

2.17. The occupation mix forms an important part of understanding skills demand and skills requirements<sup>6</sup>. Strong growth in the professional services sector translates to high demand for science and technology professionals (8.8k) and science and technology associate professionals (5.1k).

2.18. However, it is often not a direct translation between sectors and occupations. **There are many instances where strong growth in one sector disperses to growth across many different occupations**, specifically sectors with a broad occupation mix (e.g. manufacturing).

<sup>6</sup> It should be noted this analysis is 'people based' therefore based on the number of individuals, as opposed to the number of jobs (i.e. a person may have more than one job).

**Figure 2.5: Employment growth (size of bubble) by occupation (2-digit) and top 15 (3-digit), NI, 2020-2030**



2.19. At a more detailed level, the occupation with the largest growth over the next decade is forecast to be IT and telecommunications professionals (6.2k). This is directly linked to the growth of the ICT sector, and indirectly linked to an increased demand for digital skills across the wider economy. The second largest occupation growth is expected to be nursing and midwifery professionals (2.7k). Whilst growth is not expected to be particularly strong in the health and social sector, the scale of the sector means even low growth translates to a significant volume of employment creation.

### Key points

- Skills needs should be planned based upon an ambitious economic outlook, to avoid the economic costs associated with skills shortages.
- Under the high growth scenario the NI economy is forecast to grow from 902k jobs to 975k over the 2020-30 period.
- The scenario is typified by rapid growth in sectors with a high demand for higher level skills (e.g. professional services, ICT, advanced manufacturing etc.).
- Occupations directly linked to rapidly growing sectors will achieve high growth (e.g. ICT professionals). However, occupations which represent a large proportion of the current NI labour market will still create a large increase in the number of people employed even with a low growth rate (e.g. nursing and midwifery professionals).

### 3. Demand side: Skills requirements for the future

- 3.0. This section outlines the expected labour demand in the NI economy over the coming decade. This includes a review of sector and occupation demand, the associated demand for qualifications and resulting demand for subjects studied.

#### Introduction

- 3.1. A comprehensive understanding of labour demand (i.e. current and projected qualification profile by sector and occupation, subjects studied within sectors and occupations) results in a robust account of skills requirements for the future labour market. The demand side forms one half of the model developed to determine the (im)balance of future skills needs in NI.
- 3.2. The NI Skills Barometer demand side model incorporates outputs from the UUEPC economic model including occupation forecasts, sector forecasts and qualification projections. For the purposes of this summary paper, **the figures presented will focus on outputs aligned to the high growth scenario**. Detail on the baseline scenario outputs are available in Annex A of this report.

#### Demand concepts

- 3.3. There are a number of key concepts developed in determining future labour demand. It is not simply the expansion of the labour market, but rather a combination of labour market expansion and labour market flows (e.g. job to job movers, labour market leavers to retirement or sickness, labour market entrants from education or migration etc.). Table 3.1 provides an overview of demand side concepts.

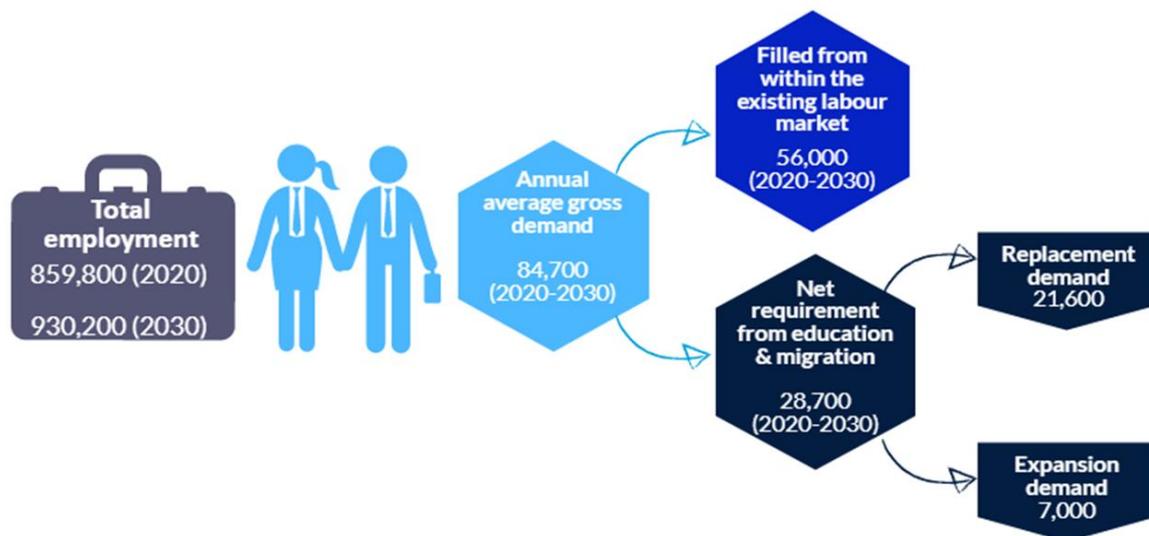
**Table 3.1: Demand side concepts, NI Skills Barometer**

Demand side concept	Definition
Expansion demand	The additional jobs created as a result of growth in a sector.
Replacement demand	The number of positions which become available as a result of staff leaving employment (typically due to retirement, family reasons, ill health or to move to another job).
Net replacement demand	The difference between all leavers from employment – to retirement, inactivity, unemployment, other jobs and out migration - and joiners to employment – from unemployment, inactivity (excluding education leavers) and other jobs.
Net requirement from education and migration	The difference between all leavers from employment – to retirement, inactivity, unemployment, other jobs and out migration - and joiners to employment – from unemployment, inactivity (excluding education leavers) and other jobs.
Annual average gross demand	The total expansion demand and replacement demand for staff per annum plus the jobs that are filled by those already in the labour market (job to job moves, returners from unemployment and inactivity).

#### Labour demand in the Northern Ireland economy

- 3.4. The annual average gross demand is expected to be 84.7k over the coming decade. Around two-thirds will be filled by those within the existing labour market (i.e. job to job moves or the unemployed or economically inactive). This leaves the remaining 28.7k (34%) to be filled by education leavers or those entering from migration.

**Figure 3.1: Demand side concepts, NI Skills Barometer, 2020-2030**



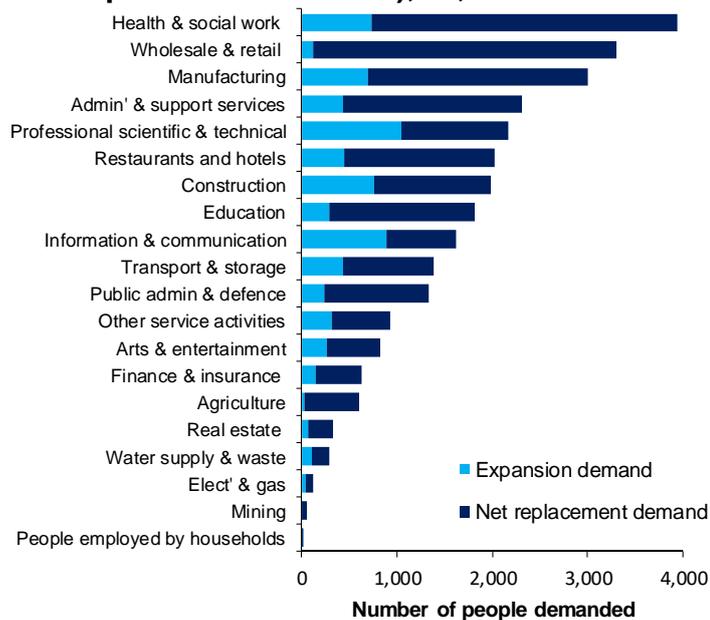
*Source: UUEPC  
Note: Figures may not sum due to rounding.*

- 3.5. The net requirement from education and migration is also referred to as future labour demand and can be split into expansion demand (7.0K) and net replacement demand (21.6k). It is important to recognise that **the majority of the net requirement from education and migration is generated by the need to replace workers within the labour market** (i.e. replacement demand), as opposed to the creation of new positions (i.e. expansion demand). Therefore, even **in the absence of strong employment growth projections the economy will generate a significant volume of employment opportunities through the necessity to replace workers.**

#### Labour demand by sector

- 3.6. The components of net requirement (i.e. expansion demand and replacement demand) are determined by the composition of the sector (e.g. retention rates) and the forecast employment growth (i.e. stronger growth in 10X priority clusters). **Those sectors with higher growth rates will see relatively stronger expansion demand compared to those with lower growth prospects.**
- 3.7. For example, **as a relatively small but rapidly expanding sector, expansion demand will account for over half (55%) of the net requirement for the ICT sector.** Similarly, strong growth in the professional services sector translates to almost half (48%) of the net requirement accounted for by expansion demand.

**Figure 3.2: Annual average net requirement by sector (expansion and replacement demand), NI, 2020-2030**



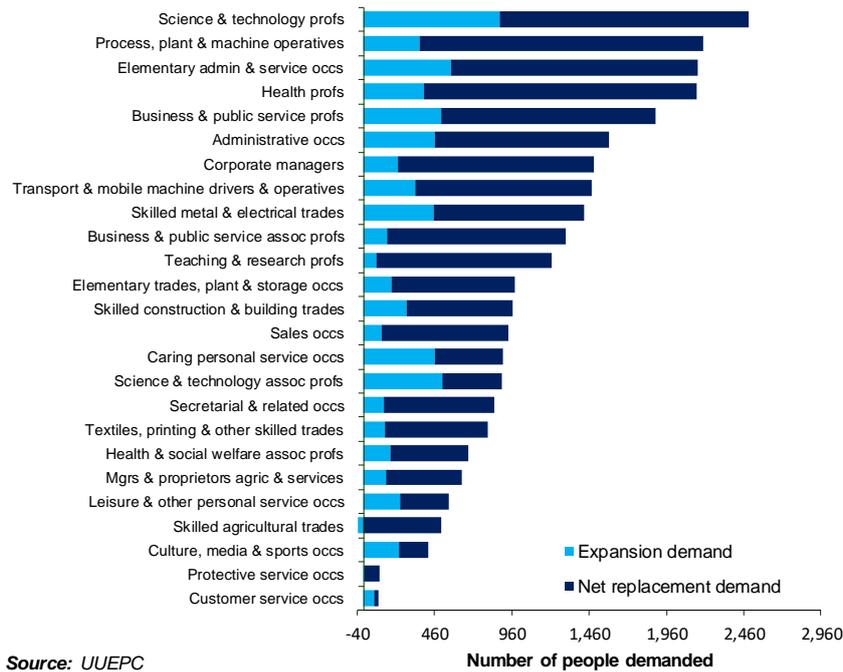
Source: UUEPC

- 3.8. It is important to **recognise replacement demand plays a substantial role in providing employment opportunities**. In the wholesale and retail sector minimal growth is forecast resulting in almost all (96%) of the net requirement being generated from replacement demand. This highlights the importance of replacement demand, and how **sectors with low growth prospects can provide a plentiful supply of opportunities through natural labour market churn**.
- 3.9. In the restaurants and hotels sector over three-quarters (78%) of the net requirement is accounted for by replacement demand. Both wholesale and retail and restaurants and hotels are large scale sectors with a high turnover in employment as workers often use these sectors as a short-term base before moving into longer-term employment (e.g. students). **Overall, the health and social care sector accounts for the largest proportion of net requirement (14%) followed by wholesale and retail (12%) and manufacturing (10%).**

### Labour demand by occupation

- 3.10. The composition of labour demand by occupation is driven by the occupation mix within sectors. **The most in demand occupation is science and technology professionals (2.5k)** driven by strong labour demand in the professional services and information and communication sector. The health professionals occupation demand (2.3k) is among the top 4, **driven by scale of the health sector generating substantial demand through natural labour market churn**.

**Figure 3.3: Annual average net requirement by occupation (expansion and replacement demand), NI, 2020-2030**

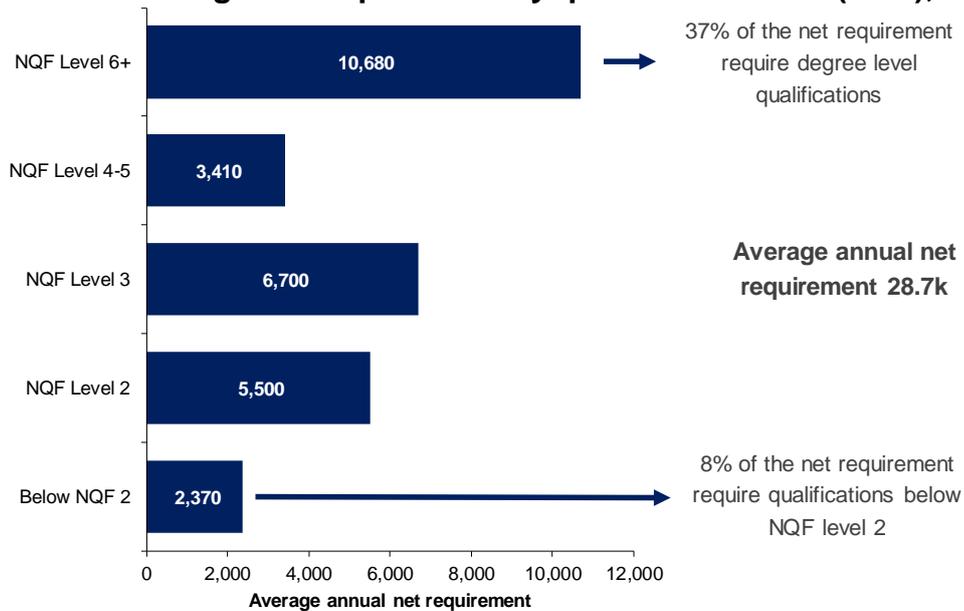


Source: UUEPC

### Labour demand by qualification

3.11. The demand for qualifications is driven by the qualification profile within sectors. For example, strong growth in a sector with a high concentration of graduates will generate demand for degree level qualifiers. **It is expected, almost two-fifths (37%) of labour demand over the coming decade will require NQF level 6+ qualification (i.e. undergraduate degree, masters, PhD).**

**Figure 3.4: Annual average net requirement by qualification level (NQF), 2020-2030**



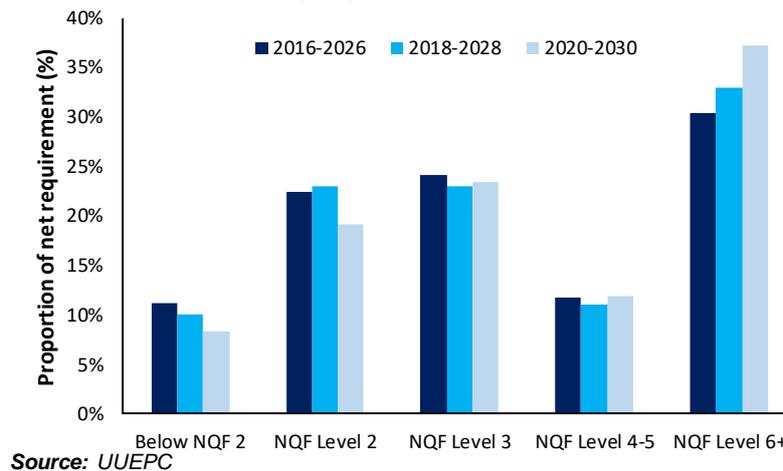
Source: UUEPC

3.12. At the bottom end of the qualification spectrum **the squeeze on lower qualified individuals is evident, only 8% of the net requirement are demanded at NQF level**

**2 and below.** This figure has fallen from 16% in the first iteration of the NI Skills Barometer (2015-2025), and has coincided with a rapid increase in education attainment amongst education leavers.

- 3.13. As many occupations associated with lower levels of qualification are increasingly at risk of automation<sup>7</sup> and employers have adjusted expectations to a higher qualified supply, **the demand for education leavers with low qualification levels is expected to continue to fall.**

**Figure 3.5: Annual average net requirement by qualification level (NQF), by NI Skills Barometer iteration**

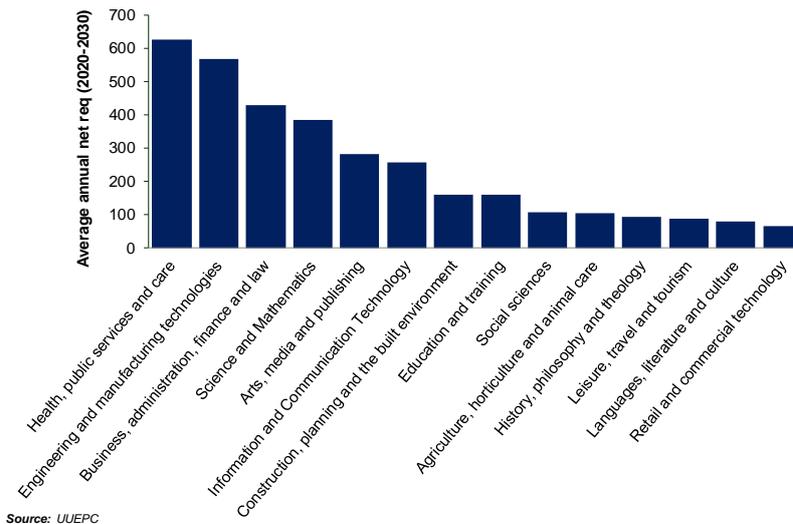


### Subject demand

- 3.14. Labour demand can also be presented by subject level for NQF level 4+. At NQF level 3 and below it is not possible as students study a range of subjects simultaneously at this level.
- 3.15. **At NQF level 4-5 the most in demand subject over the coming decade is health public services and care (0.6k) followed by engineering and manufacturing technologies (0.6k) and business, administration, finance and law (0.4k).** These subjects are closely aligned to the strong labour demand within the health and social care, manufacturing and professional services. The top three most in demand subjects at NQF level 4-5 account for almost half (48%) of the labour demanded at this level. **Overall, there is a limited supply of education leavers at this level from the NI education system.** The subject profile of demand could adjust rapidly in response to new subject provision at NQF Level 4-5

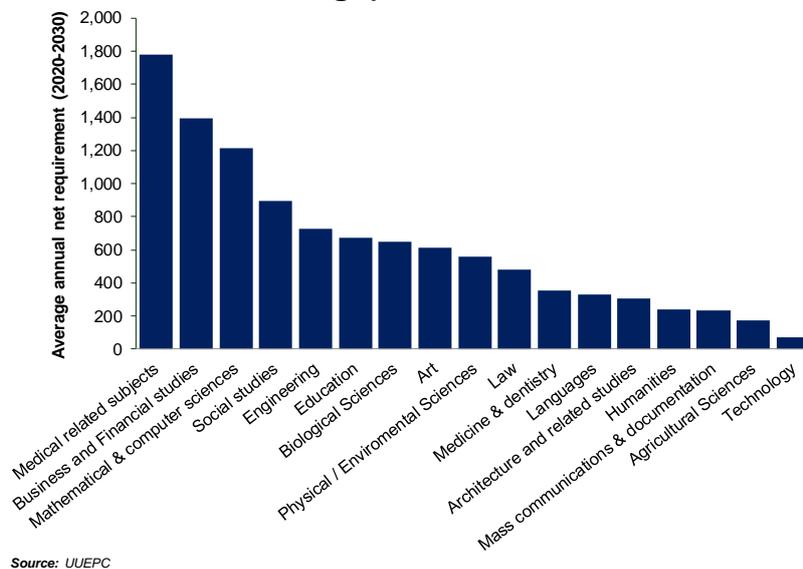
<sup>7</sup> UUEPC (2019) 'Intelligent futures: Working with automation & digitisation to deliver sustainable employment and growth' <https://www.economy-ni.gov.uk/sites/default/files/publications/economy/automation-in-northern-ireland-main-report.pdf>

**Figure 3.6: Average annual net requirement for NQF level 4-5 by subject (SSA, 1-digit), 2020-2030**



3.16. The composition of demand across subjects is similar at NQF level 6+. **The most in demand subject category is medical related subjects (1.8k) followed by business and financial studies (1.4k) and mathematics and computer science (1.2k).** These top three subjects account for over two-fifths (41%) of the NQF level 6+ net requirement.

**Figure 3.7: Average annual net requirement for NQF level 6+ by subject (JACS, 1-digit), 2020-2030**



### Key points

- Replacement demand is key, and provides a larger quantum of job opportunities than sector growth
- There is an increasing demand for higher level qualifications, which is an adjustment to enhanced supply.
- Sector expansion drives demand in high growth sectors (e.g. ICT) and occupations (e.g. science and technology professionals), but replacement demand is larger in staple sectors (e.g. retail) and occupations (e.g. health professionals).

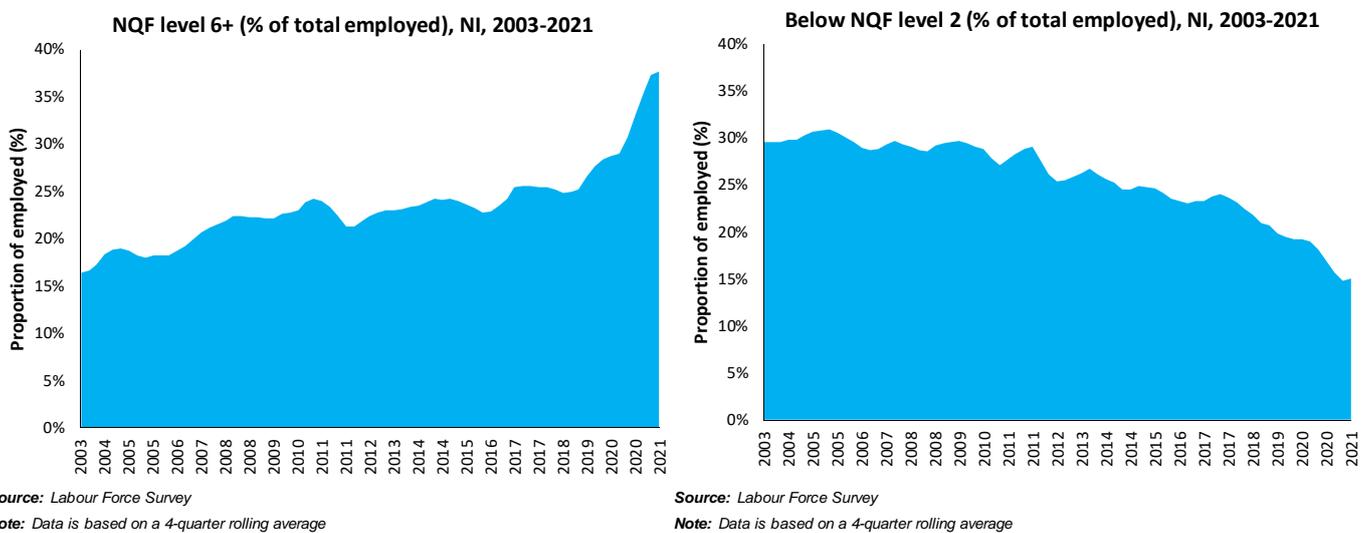
## 4. Supply side: Qualifiers from education

4.0. This chapter provides an overview of supply side information, including trends in school performance and FE participation and HE participation.

### Trends in the stock of skills in NI

4.1. There has been a long-term shift in the stock of skills over the past two decades. **The proportion of people in employment with at least an undergraduate degree (NQF level 6+) has more than doubled from 16% in 2003 to 38% in 2021.** Whereas the stock of low-level qualifications (below NQF level 2) has halved from 30% to 15% over the same period.

**Figure 4.1: Employment by highest level of qualification (NQF level), 2003-2021**

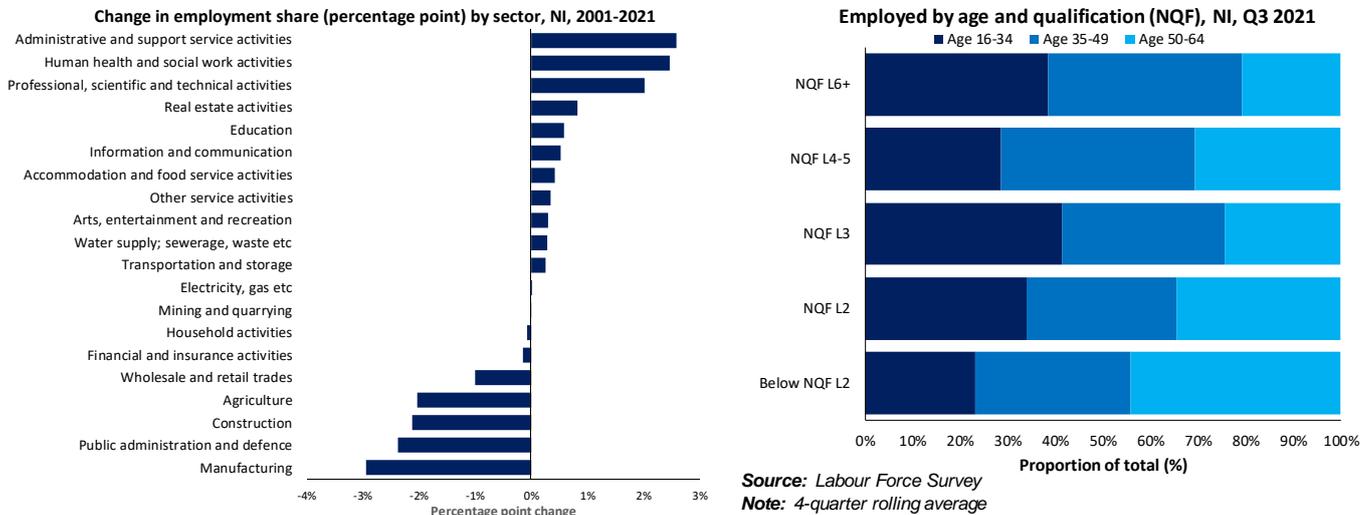


4.2. On a longer term basis, the trend is driven by two key factors:

- 1) **A generational effect** whereby older workers with lower levels of qualification exit employment to retirement to be replaced by younger labour market entrants with higher level qualifications. For example, amongst persons employed just over one in four (27%) of the over 50's has an NQF level 6+ qualification compared to almost one in two (49%) people aged 22-35. The over 50's represent half (49%) of people in employment with a qualification below NQF level 2 and only 23% of people with an NQF level 6+ qualification. This highlights the long-term improvement in education attainment over time that has created a large qualifications gap between generations.
- 2) **A changing sector mix**, whereby the economy has shifted away from sectors that require lower levels of qualification towards sectors requiring higher level qualifications. For example, the sectors which have increased their share of employment the most over the past 20 years are health and private services (i.e. administration and support services, professional services and ICT), which have a high graduate content. The sectors that have experienced the largest fall in their share of employment include retail, agriculture and construction which tend to have a relatively low qualifications profile. Manufacturing has reduced its share of total

employment more than any other sector. This reflects a shift towards advanced manufacturing which requires fewer, but higher qualified, workers.

**Figure 4.2: Employed by highest level of qualification (NQF) and age, Q3 2021 and change in workforce jobs, Sept 01- Sept 21**



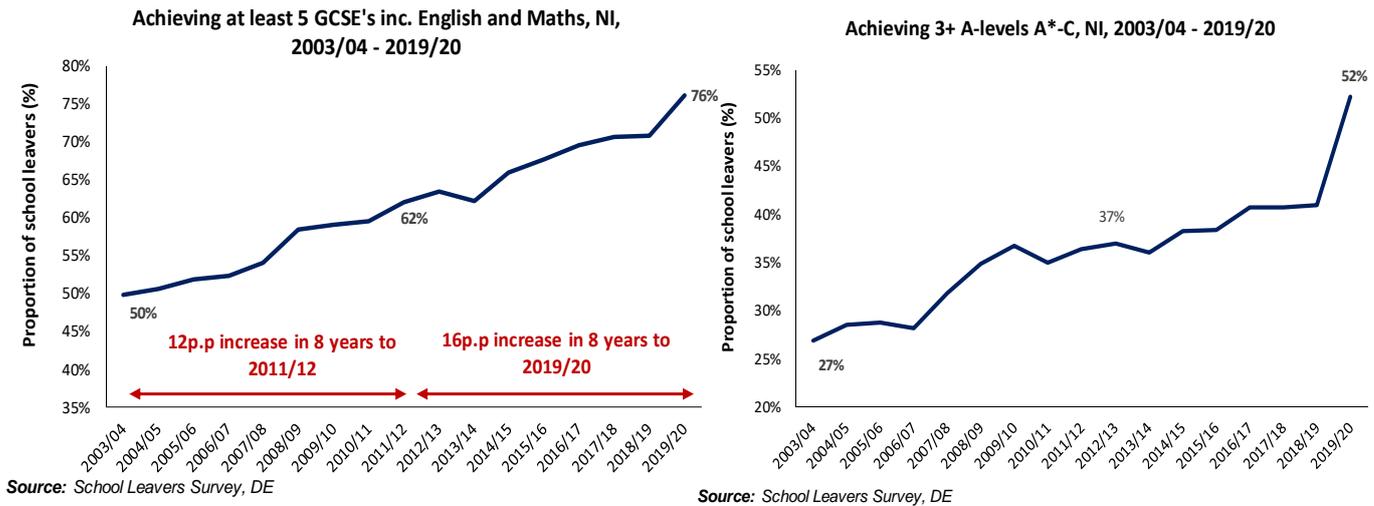
Source: ONS, Workforce jobs

- 4.3. It is important to note that in 2020/21 the impact of the Covid-19 pandemic has accelerated these existing trends. For example, in NI’s pre-pandemic labour market 28% of people in employment had an NQF level 6+ qualification. This had increased to 38% by mid-2021, reflecting the unequal nature of the crisis on the labour market. Almost all of the net decrease in employment has been recorded amongst those with lower levels of qualification, which has increased the average stock of skills amongst those in employment.
- 4.4. In the short-term it is likely that there will be a reduction in the qualifications profile of the employed, representing a return to employment of workers who have lost their jobs during the pandemic. However, it is unlikely that the stock of qualifications amongst the employed will return to pre-pandemic levels as some of this labour will be permanently outside the labour force (e.g. economic inactivity, retirement etc.).

### School leavers qualification levels

- 4.5. The past two years have been associated with severe disruption to the education system. At the time of writing the latest available data from the NI School Leavers Survey relates to 2019/20 and included a record high number of school leavers having achieved at least 5 GCSE’s A\*-C (including English and maths) at 76%. This represented a significant increase from 71% the previous year. However, it is important to highlight that this is an acceleration of an existing trend, with only 50% of school leavers achieving this level of attainment as recently as 2003/04.
- 4.6. The recent increase in attainment has been more pronounced amongst the group achieving 3+ A-levels A\*-C, which increased from 41% to 52% between 2018/19 and 2019/20. Although the proportion of school leavers reaching this level of attainment has increased significantly since 2003/04 from 27%, the proportion had been relatively stable in the previous five years oscillating between 38-41%.

**Figure 4.3: School leavers by attainment, NI, 2003/04-2019/20**



- 4.7. This changing pattern of attainment in schools has labour supply impacts, with higher attainment pupils are more likely to remain in school beyond their GCSE's and proceed to FE and HE after completing A-levels. For example, **in 2003/04 64% of school leavers attended HE or FE, by 2019/20 this had increased to 79%<sup>8</sup>.**
- 4.8. **The increase in the proportion of school leavers moving directly into HE increased from 37% to 49% between 2003/04-2019/20.** With a lower proportion of school leavers entering the labour market directly from school and a higher proportion attending longer courses in HE the effect is to **reduce the annual outflow of labour from the education system to the labour market.** This squeeze is **more acutely felt amongst the supply of lower level qualifications** as NI transitions towards a higher qualified labour market.
- 4.9. These trends highlight the important role of strong careers advice at school. Data from the OECD PISA study<sup>9</sup> highlights that virtually no students aged 15 expected to work in a low skilled occupation by the time they reached 30, regardless of their academic achievement or social background. A separate study<sup>10</sup> of British teenagers aged 13-18 found that their career expectations had little in common with expected patterns of labour market demand. Therefore, **use of up to date Labour Market Intelligence is crucial for pupils to make informed choices regarding career aspirations and subject choices.** These data also highlight the scale of the challenge in attracting education leavers to seek a career in sectors that are not perceived as 'high status'<sup>11</sup>. **It is imperative that careers guidance promotes the opportunities across all economic sectors.** This should ensure appropriate knowledge of qualifications required, pathways available and development opportunities to effectively align expectations with opportunities available in the labour market.

<sup>8</sup> Destination of school leavers data presented excludes those with an 'unknown' destination.

<sup>9</sup> OECD (2018) PISA database 2018. Available via: <https://www.oecd.org/pisa/data/2018database/> [Last accessed on 18<sup>th</sup> December 2021]

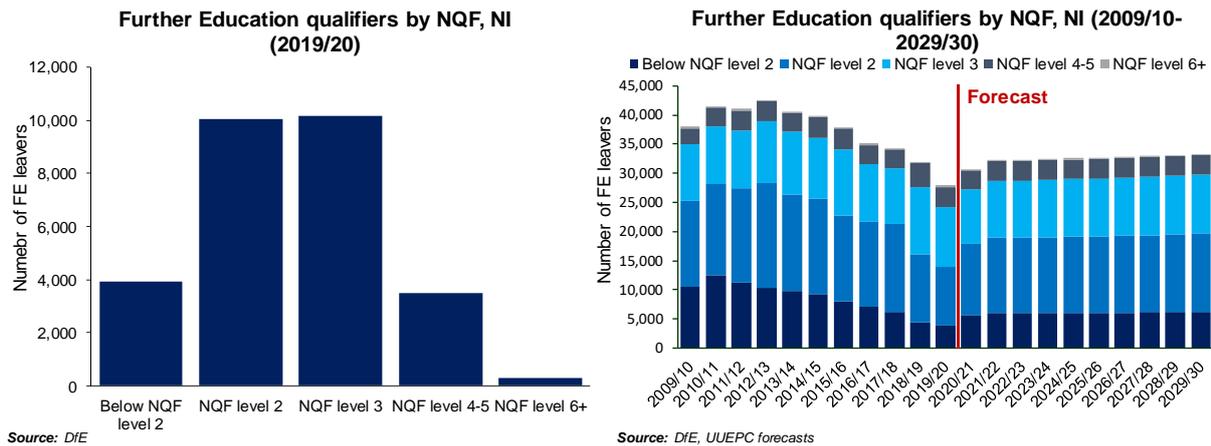
<sup>10</sup> Mann et al (2013) Nothing in common: The career aspirations of young Britons mapped against projected labour market demand 2010-20, Occasional Taskforce Research Paper, No. 2, Education Employers Taskforce, London.

<sup>11</sup> Doctors, teachers and business managers are the most common occupational expectation amongst 15 year olds in OECD countries.

## Further Education leavers qualification levels

- 4.10. The traditional education journey for school pupils achieving lower level academic qualifications was to proceed to FE or to enter the labour market. The increase in academic achievement at school which has resulted in more school leavers attending HE has reduced the supply of qualifiers from FE. In particular, **the number of qualifiers achieving qualifications at NQF level 2 and below has halved from 28k to 14k between 2012/13-2019/20.**

**Figure 4.4: Further Education qualifiers by NQF level, 2009/10-2019/20**

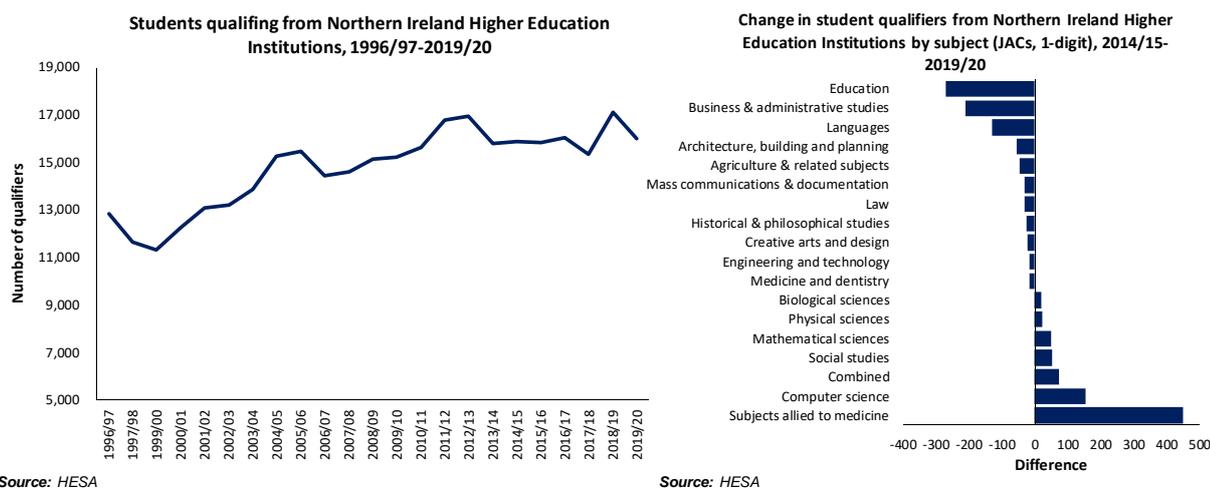


- 4.11. The share of tertiary qualifications (NQF level 4+) delivered at FE has increased over the past decade. However, this is largely due to a fall in overall FE numbers driven by a decline in lower level qualifiers. The absolute number of tertiary qualifiers from FE has remained largely static over the past 10 years.

## Higher Education leavers: NI Higher Education Institutions

- 4.12. The number of qualifiers from NI Higher Education Institutions (HEI) was 16k in 2020, this has been relatively stable over the past decade. However, in 2020 the population of 21-year olds – the typical age of a qualifier from a three year undergraduate programme – is 10% lower compared to ten years earlier. Therefore, while the absolute number of graduates has remained within a relatively narrow band, **the proportion of young people attending and qualifying from HE has increased.**

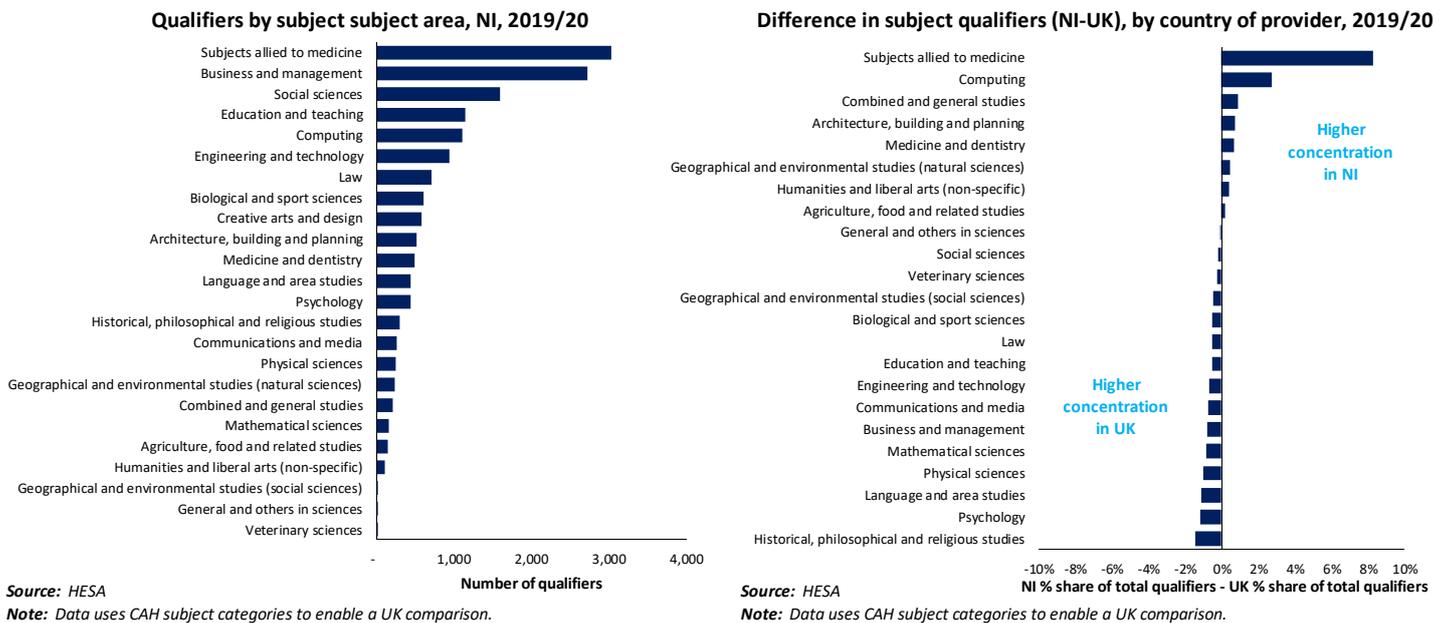
**Figure 4.5: Higher Education qualifiers by NQF level and subject area, 1996/97-2019/20**



- 4.13. Over the past five years the profile of subjects studied at NI HEI's has shifted. However, the changes are concentrated in a relatively small number of subject areas. **The largest increase was recorded in subjects allied to health**, driven by an increase in 'others in subjects allied to health'<sup>12</sup>; 'nursing' and 'pharmacology, toxicology and pharmacy'.
- 4.14. **The largest decrease in subjects studied over the past five years has been in education subjects ('training teachers' and 'academic studies in education')**. This subject category has been highlighted as an area of oversupply in earlier iterations of the NI Skills Barometer. There have also been significant falls in business and administrative studies qualifiers, and in languages.
- 4.15. Previous iterations of the NI Skill Barometer have highlighted a significant undersupply of skills in computer science and engineering subjects. While the number of **computer science qualifiers has increased over the past five years, the increase is not of a sufficient quantum to have filled the skills gap** highlighted in earlier reports. Over the same period, the number of **engineering qualifiers has marginally decreased, exacerbating previously identified undersupply** within in this subject area.
- 4.16. It is worth pausing to consider the overall supply of graduate qualifications from NI HEI's. The first consideration is the large number of health-related qualifications. **Health related subjects (subjects allied to medicine; medicine and dentistry) account for over one in five HE qualifications (22%)**. There is a plentiful supply of graduates in general subjects in business, management social sciences, which together account for more than one in four graduates (27%). However, there is **a low representation of some more specialised subject areas such as creative arts and design, mathematical sciences and some STEM subject areas**.

<sup>12</sup> This category includes: environmental health; occupational health; occupational therapy; counselling; paramedical science; physician assistant studies; and other subject allied to medicine.

**Figure 4.6: Higher Education qualifiers by subject in NI and relative differences in qualifiers between NI and the UK, 2019/20**



4.17. **A lack of graduate subject diversity is not unique to NI.** For example, a relatively higher proportion of graduates in the UK are in business and management studies. Although the absolute number of qualifiers in NI suggests low qualifier numbers in some STEM subjects, overall NI has a higher proportion (50%) of broad STEM qualifiers compared to the UK (41%). However, this is largely driven by a higher proportion of health-related graduates. **The proportion of narrow STEM<sup>13</sup> graduates in NI and the UK is similar at 23% and 24% respectively.**

4.18. Although NI has a higher proportion of graduates in computer science compared to the UK, this is a logical outcome. The UK has a more developed ICT sector compared to NI. This results in the sector in NI being more reliant on labour supply from the education system as there are relatively fewer experienced hires available from within the existing labour market to fill vacancies.

4.19. The proportion of narrow STEM qualifiers from NI HEI's was 23% in 2019/20. Although this is higher when compared to 2013/14, the scale of the increase has been marginal. A large gap exists between the proportion of male and female students studying narrow STEM subjects, at 36% and 15% respectively. **The gap is particularly pronounced in engineering, technology and computer science subjects, where 25% of males study these subjects compared to just 5% of females.** If the overall proportion of narrow STEM qualifiers is to be increased, then raising the proportion of females in these subject areas is crucial.

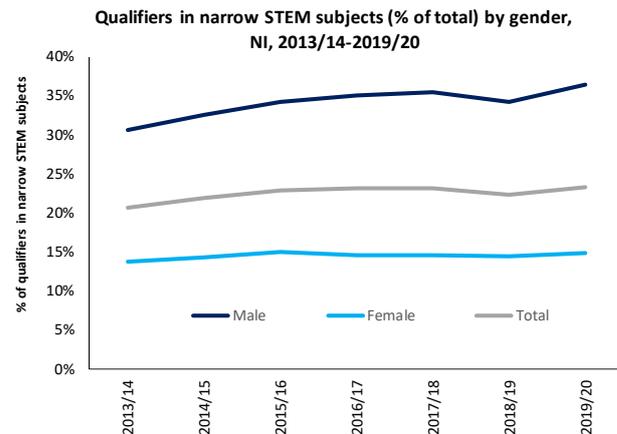
<sup>13</sup> Narrow STEM is a subset of Broad STEM and includes the following subject areas: Biological and sports sciences; Psychology; Physical sciences; Mathematical sciences; Engineering and technology; Computing; and Geographical and environmental studies (natural sciences).

**Figure 4.7: Percentage of qualifiers from NI HEI's in narrow STEM subject areas by gender, 2013/14-2019/20**

**Qualifiers in narrow STEM subjects (% of total), by gender, NI, 2019/20**

Narrow STEM	Male	Female	Total
Biological and sport sciences	5%	3%	4%
Psychology	1%	4%	3%
Physical sciences	2%	1%	2%
Mathematical sciences	1%	1%	1%
Engineering and technology	12%	2%	6%
Computing	13%	3%	7%
Geographical and environmental studies (natural sciences)	2%	1%	1%
<b>Narrow STEM</b>	<b>36%</b>	<b>15%</b>	<b>23%</b>

Source: NISRA, HESA



Source: NISRA, HESA

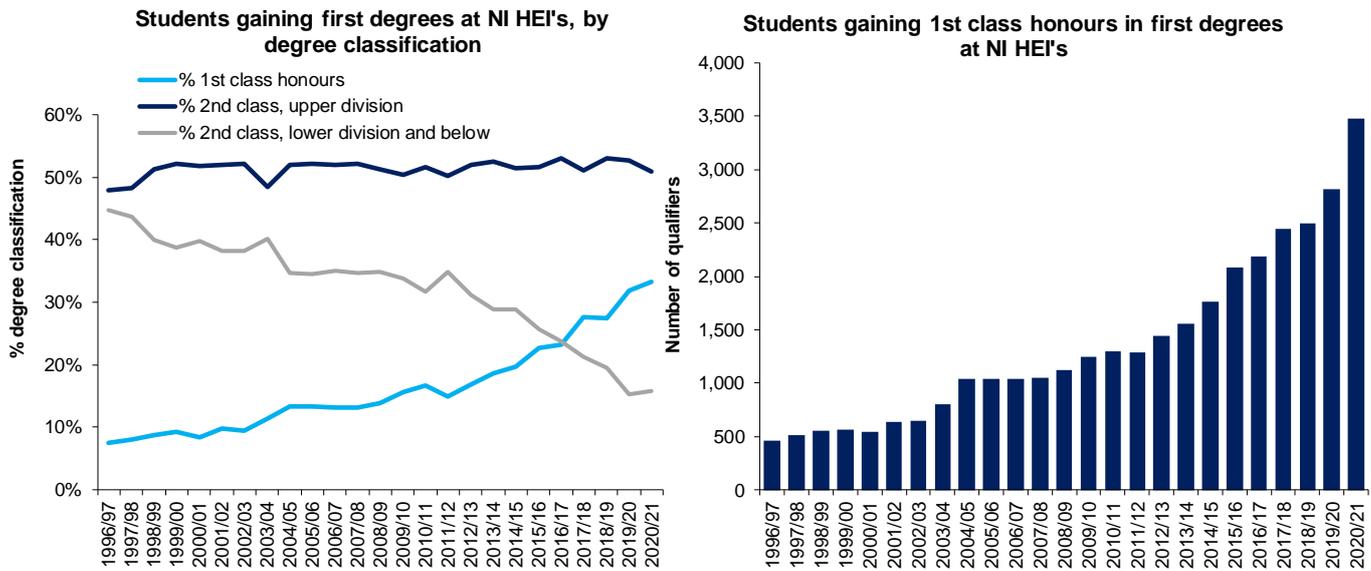
- 4.20. Encouraging higher participation in STEM subjects is not an issue related to HE alone, the ultimate education journey taken often depends on subject choices at school. There is evidence of decreasing student numbers in some key STEM subjects (e.g. computing<sup>14</sup>). Therefore, initiatives to increase participation in STEM subject areas should continue to be targeted at school pupils from a young age.

### Higher Education leavers: Attainment levels

- 4.21. The HE system in NI has been transformed over much of the past 25 years. Pre-2000 less than one in three school leavers attended HE and less than one in ten qualifiers achieved a first-class honours degree. Today, **almost half of school leavers proceed directly to university, and almost one in three qualifiers achieves a first-class honours degree.**

<sup>14</sup> Gould, M. (2021) Software skills for a 10X economy. Digital Skills NI Network.

**Figure 4.8: Higher Education qualifiers by degree classification, NI, 1996/97-2019/20**



Source: NISRA, HESA  
 Note: Excludes unclassified degrees

Source: NISRA  
 Note: Excludes unclassified degrees

4.22. Comparing a system that has reformed over time is not making a like for like comparison. For example, assessment methods have changed considerably from primarily exam based towards project-based coursework. However, it is worth highlighting the data which illustrates a first-class honours graduate is no longer the scarce commodity of two decades ago. Today's graduates qualify with different types of skillsets compared graduates of previous years.

4.23. **It is possible that employer attitudes have not adjusted at the same pace of change occurring in the education system.** This could be a contributing factor to the negative perception results in respect of recent graduates frequently recorded in employer surveys. For example, a recent survey by the Chartered Management Institute found that 80% of UK employers believe that current graduates do not arrive fully equipped with the skills required to be work ready<sup>15</sup>.

### Higher Education leavers: NI domiciled

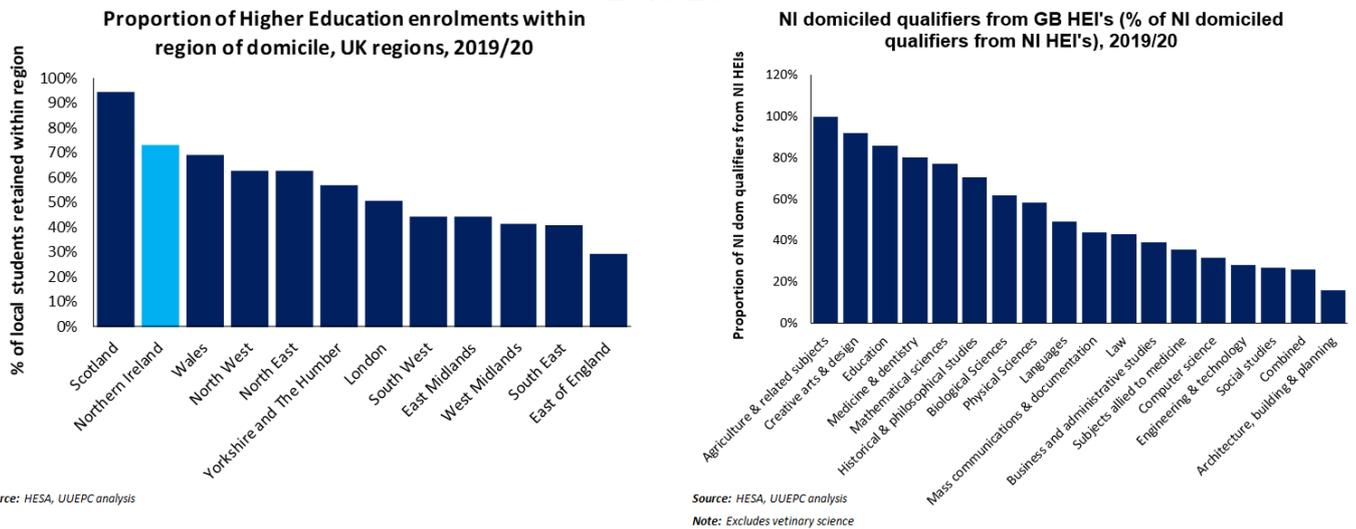
4.24. The supply of labour from HE does not only come from NI HEI institutions. A number of NI domiciled graduates achieve their qualifications from universities outside NI and then return to live and work in NI. This is an area which has received a lot of attention in recent years due to the Maximum Student Numbers Cap (MaSN), which restricts the overall number of places for NI students in NI HEI's. The restricted places cause some students to leave NI for study elsewhere and reduces the probability of this group working in the NI labour market. This effect is commonly referred to as the 'brain drain'.

4.25. However, it is useful to place this flight of human capital in context by comparing across UK regions. Although this is not technically comparing like for like due to regions in Great Britain (GB) being connected by land, it does provide a useful insight that **losing**

<sup>15</sup> Chartered Management Institute (2021) Work ready graduates: Building employability skills for a hybrid world.

**talent to other regions is a problem not unique to NI.** In fact, almost three-quarters (73%) of NI domiciled students are studying within NI HEIs, a retention of indigenous students second only to Scotland<sup>16</sup>.

**Figure 4.9: HE enrolments studying within their by region of domicile and NI domiciled qualifiers from GB HEI's as a proportion of NI domiciled qualifiers from NI HEI's by subject, 2019/20**



4.26. The MaSN cap does have some unintended consequences in the local education system, whereby entrance requirements have become high for NI students in popular subject areas<sup>17</sup>. This causes some students to leave NI for study.

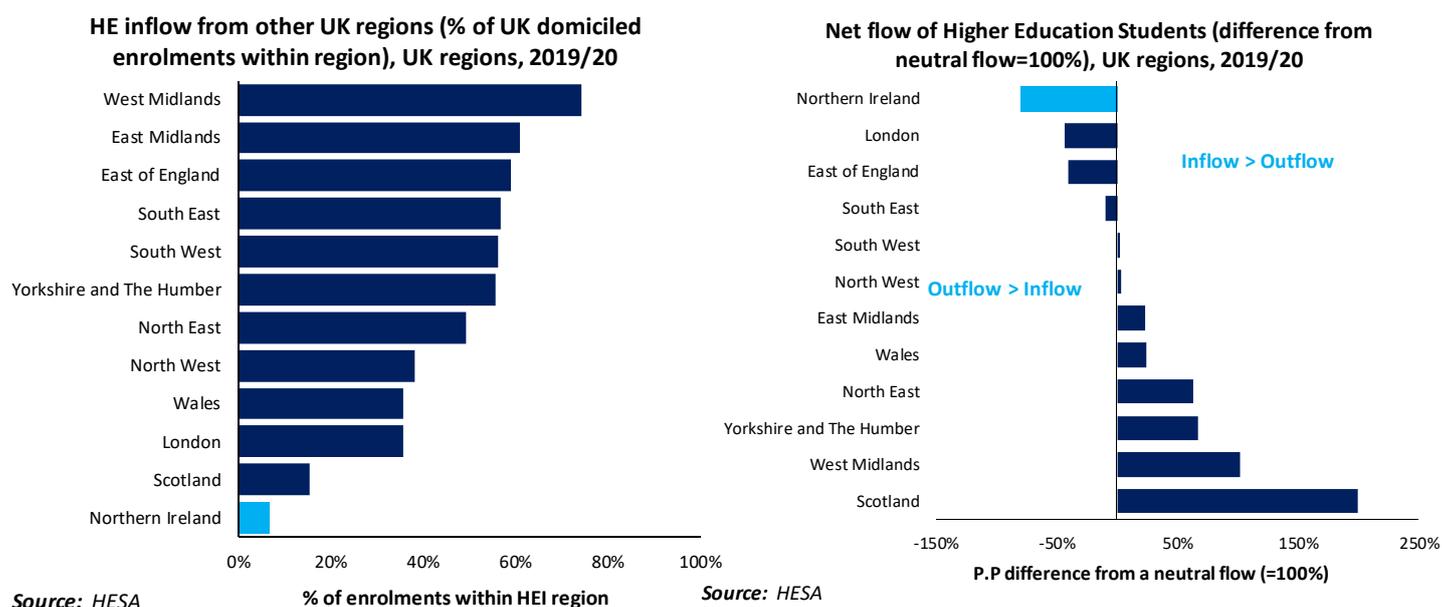
4.27. NI domiciled qualifiers studying in GB could provide a **boost to the supply of higher-level qualifications in particular subject areas by seeking to retain those students who leave to study in GB**. For example, the supply of creative arts and design students in NI could be increased by four-fifths by retaining those who leave to study elsewhere.

4.28. Although NI's outflow of students to other regions is relatively low compared to other UK regions, **NI's inflow of students from other regions is the lowest in the UK by a considerable margin**. This results in NI having the largest negative net flow of students to HE institutions of any UK region.

<sup>16</sup> University is free in Scotland for Scottish students.

<sup>17</sup> BBC (2020) Local universities set bar higher for local students. Accessible via: <https://www.bbc.co.uk/news/uk-northern-ireland-53740458> [Last accessed on 18th December 2021].

**Figure 4.10: Higher Education inflow from other regions and the net flow of students by region, 2019/20**



4.29. As NI's ability to attract talent from elsewhere is considerably lower when compared to other UK regions, it raises two issues for consideration.

- The lack of students from other UK regions increases **the importance of NI retaining its own talent** as there is not sufficient replacement imported from elsewhere.
- Other regions **benefit from an inflow of skills** by attracting students from elsewhere. Importing a wider pool of talent to study in NI requires an improvement in NI's image as a place to live, work and study. Recent research by Pivitol<sup>18</sup> amongst NI domiciled talent who left to work and/or study in GB highlighted a number of issues beyond simply building a stronger economy. These included poor community relations, ineffective government, leisure options, diversity of the education offering and strong links between work placements and degree courses. These are important issues not only for retaining NI talent, but also to **increase the attractiveness of NI to enable the importation of skills outside the local labour market.**

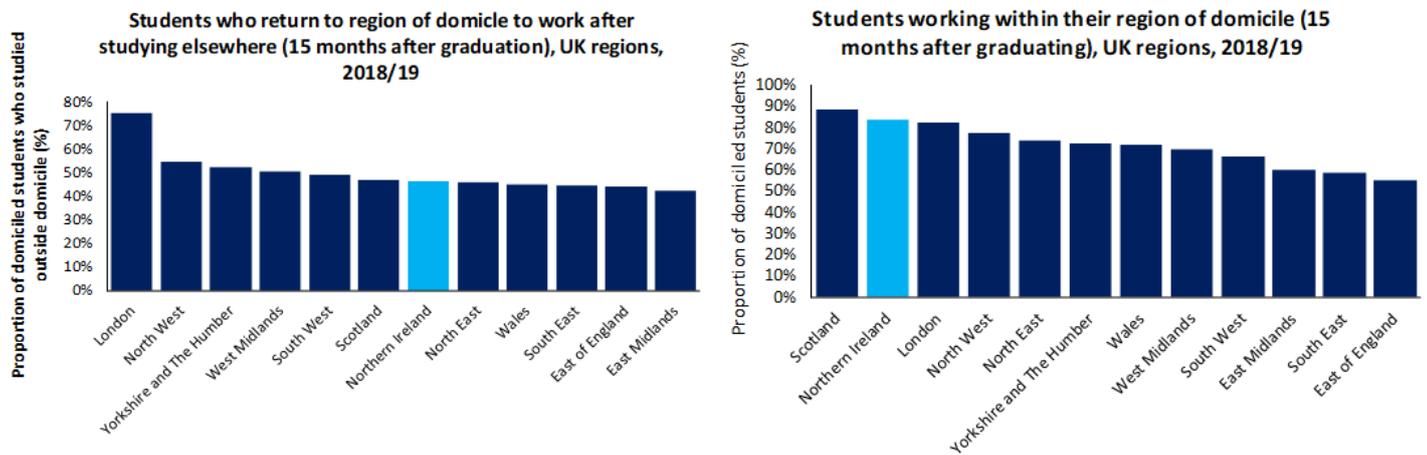
4.30. However, where people end up working is not necessarily in the same region in which they studied. **Of NI domiciled students studying in GB, 47% had returned to work in NI 15 months later.** This is a relatively similar proportion to other UK regions, with the exception of London.

4.31. Overall, **NI performs second only to Scotland for retaining talent within the local labour market.** In 2018/19 84% of NI domiciled students who had graduated 15 months earlier were working within the NI labour market. Mobile labour is part of a healthy economy, and there will always be intra-UK migration flows to match people to jobs. NI's retention rate of graduate talent is already relatively high. Therefore, while there is scope for further retention, the potential for gains is limited. **Any strategy for increasing the supply of high-level skills should not only focus on retention of**

<sup>18</sup> Pivitol (2021) Should I stay or should I go? Reasons for leaving Northern Ireland for study or work.

NI domiciled labour but also seek to enhance NI’s ability to attract skilled labour from elsewhere.

**Figure 4.11: Return rate of students studying outside their region of domicile and the overall retention rate of domiciled graduates 15 months after graduation, 2018/19**



Source: HESA

Source: HESA

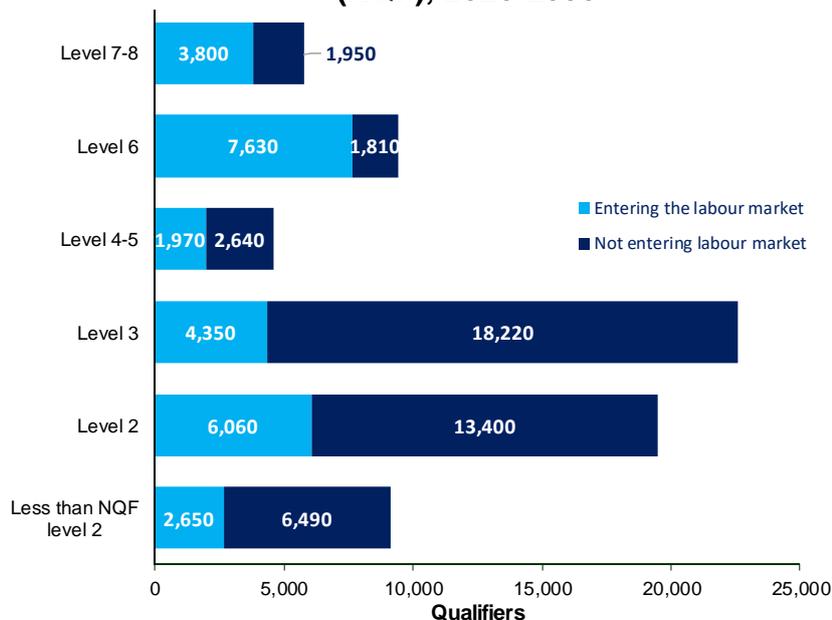
### Total supply of skills

- 4.32. Combining the education supply across the school, FE and HE systems enables a consideration of the total supply of skills from the education system. Using demographic projections<sup>19</sup> and assuming current enrolment patterns, **it is estimated that between 2020-30 71k people per annum will gain qualifications. However, only 35% of these individuals will enter the labour market** (i.e. become economically active whereby they are either employed or unemployed and thus actively seeking employment).
- 4.33. The majority of the remainder proceed to further study and gain additional qualifications before entering the labour market at a later date. For example, **qualifiers at NQF level 6+ account for around one-fifth of total qualifiers, but represent almost two-fifths of qualifiers who enter the NI labour market.**
- 4.34. Overall, there are a significant number of qualifiers at NQF level 2 and below. However, relatively few of this cohort enter the labour market, with the majority proceeding to further study. The disruption to the education system since March 2020, changing assessment methods, higher attainment levels and higher progression rates have reduced the supply of people entering the labour market at NQF level 2 and below, relative to earlier years.
- 4.35. In UUEPC’s supply side modelling, it is assumed that 2021 attainment levels are similar to 2020, but then return to 2019 levels for the remainder of the forecasting period. Even with this assumption the proportion of people entering the labour market at NQF level 2 and below is almost one tenth lower when compared to the 2017 Skills Barometer. If the attainment profile were to remain at current elevated levels, this

<sup>19</sup> The analysis uses the most recent NISRA demographic projections.

would create long-term recruitment difficulties and place significant pressure on sectors which have typically relied on labour supply at this NQF level (i.e. hospitality, retail, manufacturing and other services). Therefore, it is **important to have a diverse supply from the education system including courses which combine the ability to transition to the labour market earlier while also ensuring the achievement of higher-level qualifications.**

**Figure 4.12: Average annual labour market supply by qualification level (NQF), 2020-2030<sup>20</sup>**



Source: UUEPC

### Key points

- A changing sector mix and large qualification differences between generations is driving up the stock of higher-level qualifications in the labour market.
- Retention within the education system has increased over the longer term, but has risen considerably over the past two years. The increase in the number of years spent in full-time education has the effect of reducing the annual flow of qualifiers into the labour market.
- Attainment has also increased across all levels of the education system. With a larger number of qualifiers achieving higher level qualifications, the labour supply is reduced for occupations and sectors typically associated lower levels of graduate employment.
- The subject profile at HE has adjusted only slightly over the past five years, suggesting that there is potential to improve responsiveness to industry demand.
- NI loses high skilled labour to other regions through ‘brain drain’ effects. However, the quantum of leavers compares relatively favourably to other regions. Unlike other UK regions, NI attracts relatively few skills from elsewhere. Therefore, retaining existing talent becomes more important, alongside need to attract skilled labour from outside NI.
- The overall supply of qualifications in NI remains characterised by a ‘missing middle’, with relatively few mid-level skills provided by the education system which directly transition to the labour market.

<sup>20</sup> Data includes NI residents studying in non-NI HEI’s. Entering the labour market refers to education leavers who have become economically active.

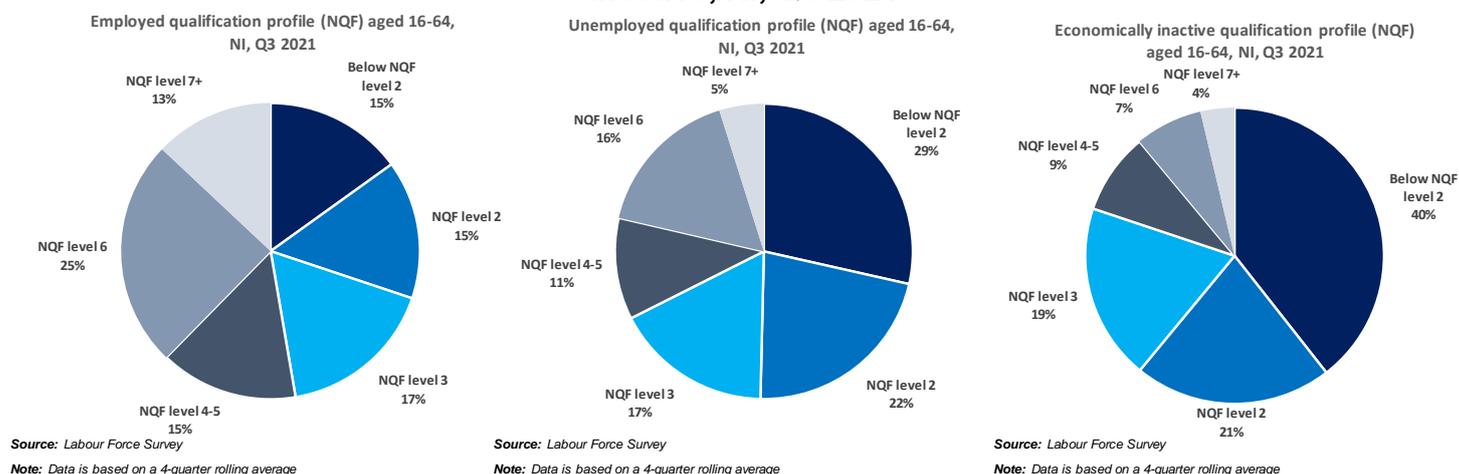
## 5. Supply side: Wider labour market considerations

- 5.0. This section provides an overview of wider labour market trends that influence the education and skills agenda. This includes an analysis of labour market qualifications, lifelong learning, demographic projections, migration and transversal skills.

### Existing Labour market

- 5.1. Alongside the education system those from the existing labour market fill a significant number of vacancies. However, to boost the size of the available labour supply there must be net inflows of people from unemployment and economic inactivity into employment. **Severe qualification mismatches between those in work and those out of work create barriers in matching the unemployed and inactive with suitable roles.**

**Figure 5.1: Qualification level (NQF) of the employed, unemployed and economically inactive, NI, Q3 2021**



- 5.2. For example, 38% of people in employment are qualified to degree level (NQF level 6+), compared to 21% of the unemployed and 11% of the economically inactive. At the other end of the qualifications ladder just 15% of people in employment have a highest level of qualification below NQF level 2, compared to 29% of the unemployed and 40% of the economically inactive.

- 5.3. With the relatively low qualifications profile of those out of work, job search tends to be associated with relatively low wage occupations. This **localises the labour supply**, as an expensive commute reduces the take home pay. In addition, the economically inactive group are primarily inactive due to reasons of disability, sickness or having caring commitments. This creates further labour market matching difficulties.

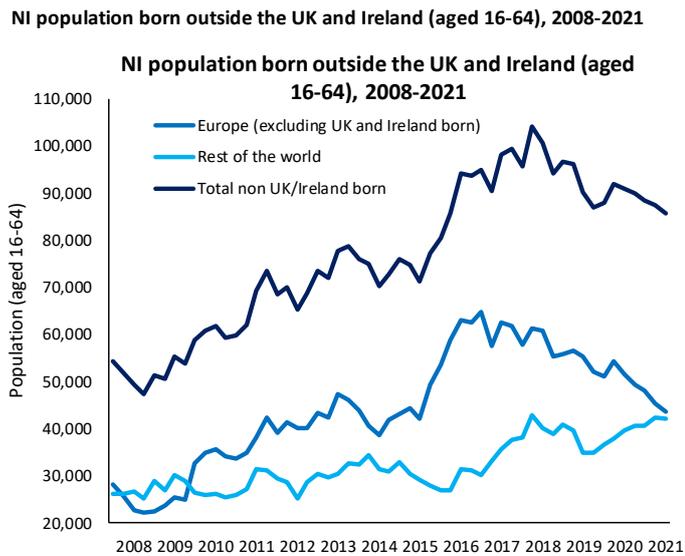
- 5.4. **NI has had the highest working age economic inactivity rate of any UK region in 92 of the past 100 quarters.** This time period represents 1996-2021, highlighting that high rates of economic inactivity have been a long-term structural weakness of the NI economy, and a key contributor to holding back inclusive economic growth. Less than one in five (16%) of the economically inactive want a job, but this still represents 51k people who would be willing to work if there was a suitable opportunity.

5.5. The successful conclusion of the furlough scheme has resulted in continued low unemployment of 32k at the time of writing. The economically inactive who want to work represent a larger potential labour supply than the stock of ILO unemployed. The current period of labour shortages highlights that while it is important that policy adequately plans for jobs in the future, **it is equally as important to plan for labour market participation**. Achieving success in raising participation is a key ingredient in both achieving more inclusive growth and to help fill existing and emerging skills shortages.

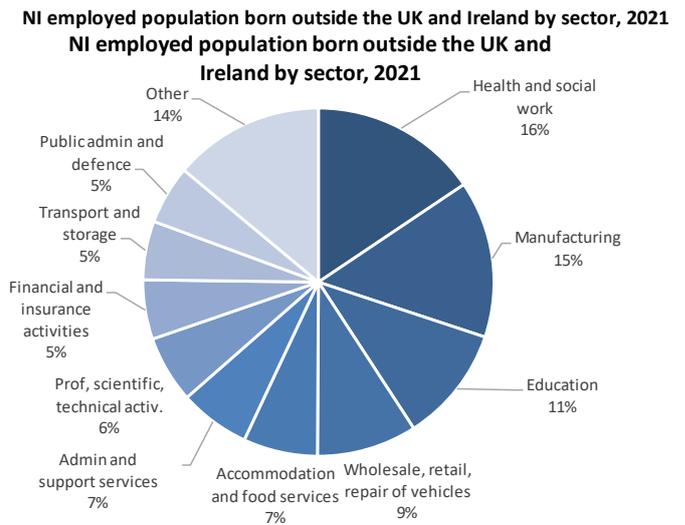
### Migration

5.6. As noted in the introduction to this report the pandemic has caused a significant reduction in international migration inflows. However, a reduction in migrant numbers has been underway in NI since the non-UK/Ireland born 16-64 population peaked in early 2018. This population fell from 104k to 86k between 2018-21, and the latest national insurance data indicates that it will shrink further in the short term contributing to labour shortages.

**Figure 5.2: Migrant population (aged 16-64) and sector of employment for migrants, NI, 2008-2021**



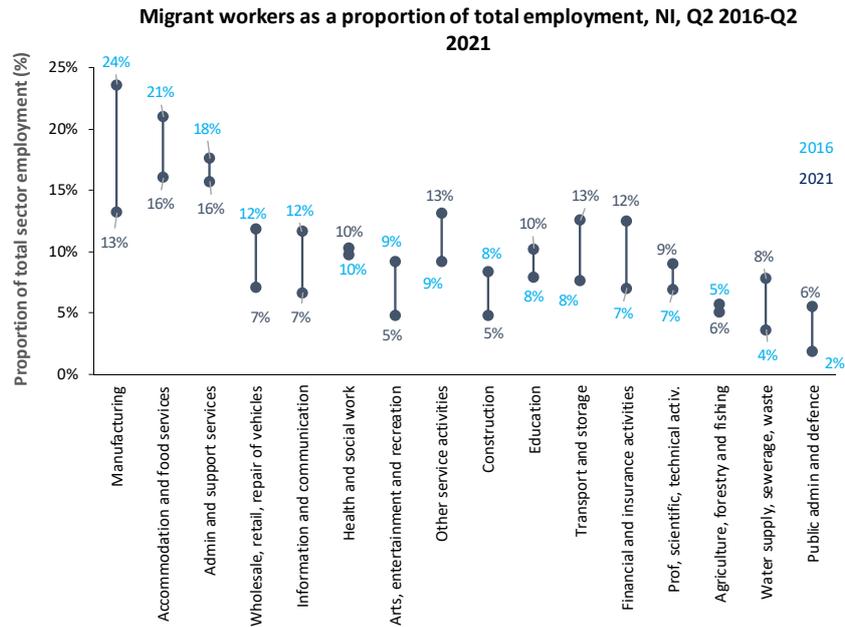
Source: APS



Source: APS

5.7. Over half of migrants working in NI are employed in the health, manufacturing, education and retail sectors. However, the individual sector reliance on migrant labour is a more appropriate metric of the contribution of changing migration flows to labour shortages. In 2016 manufacturing and hospitality were most reliant on migrants as a source of labour supply. In both sectors migrants now make up a smaller proportion of those in employment compared to 2016, reflecting the reduction in the labour supply for these sectors.

**Figure 5.3: Migrant workers as a proportion of total employment, NI, Q2 2016 and Q2 2021**



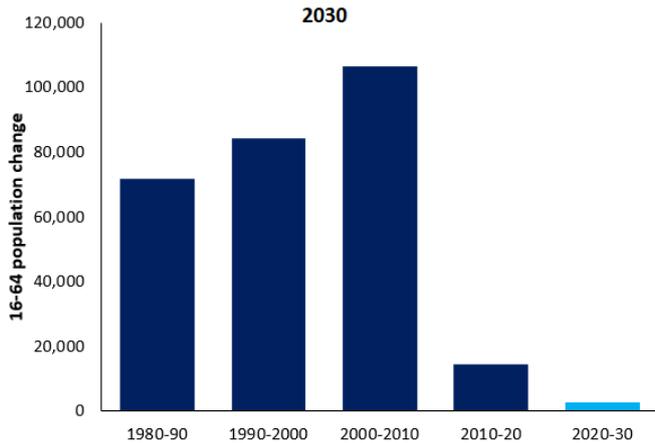
Source: ONS, LFS

## Demographics

5.8. The demographic trends in NI indicate that the competition for labour will be a feature of the future labour market. In the 1980s, 1990's and 2000's NI increased its working age population by an average 88k per decade. In the past 10 years NI's working age population has increased by only 15k, and **over the coming decade is projected to grow by just 3k.**

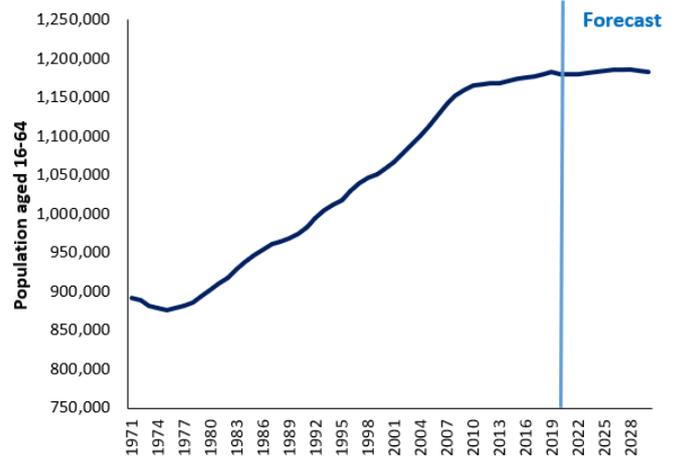
**Figure 5.4: Working age population (aged 16-64) including projections, NI, 1971-2030**

Working age population (aged 16-64) by decade, NI, 1980-1990 - 2020-2030



Source: NISRA

Working age population (aged 16-64), NI, 1971-2030

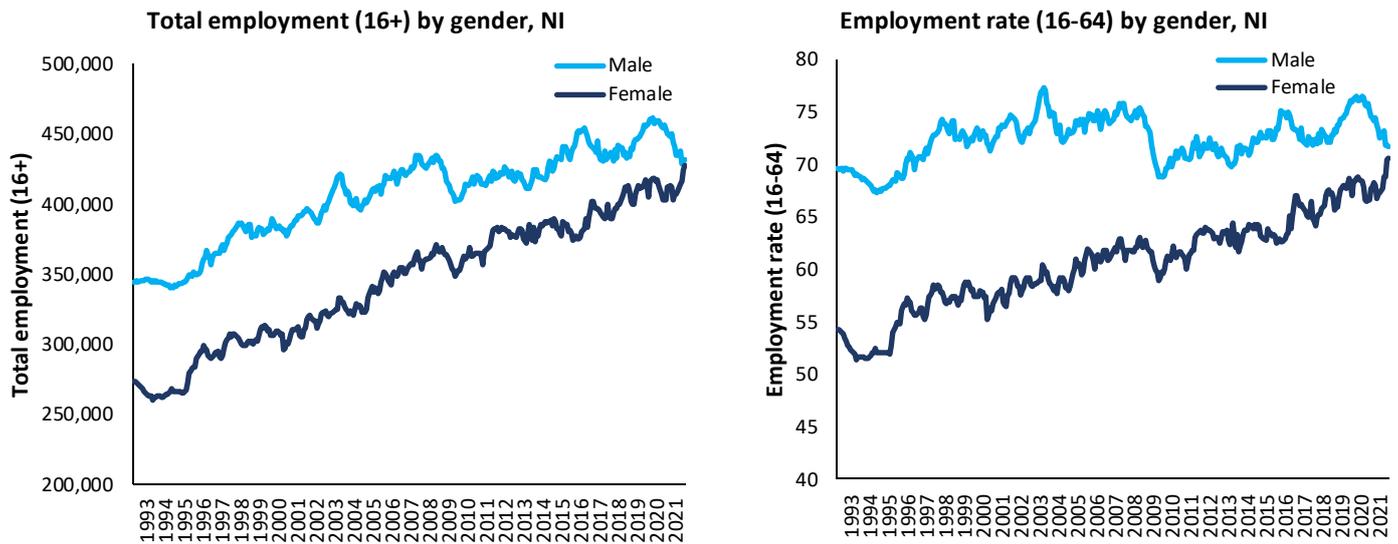


Source: NISRA

5.9. In earlier decades the NI labour market benefited from a demographic dividend, with growth in the aged 16-64 population providing a plentiful supply of labour. However, in the most recent decade growth of the working age population slowed considerably. The labour market has largely continued to supply enough workers to satisfy labour

demand. However, this has **relied upon a higher stock of migrants, albeit low relative to other UK regions, and higher labour market participation amongst females**. Over the past 10 years women have accounted for over four-fifths of the overall increase in total employment. However, with the female employment rate almost converging with the male rate, the scope for raising NI's labour supply from further catch-up effects in female participation is limited.

**Figure 5.5: Total employment (16+) by gender and employment rate (16-64) by gender, NI, 1993-2021**



Source: ONS, LFS

Source: ONS, LFS

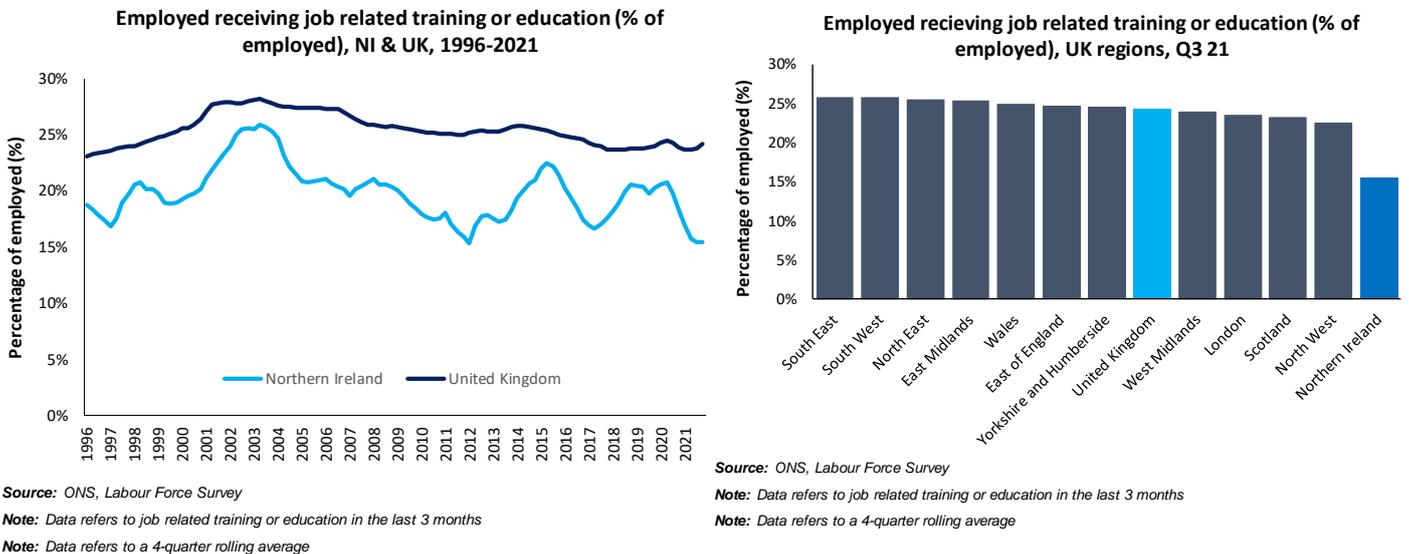
### Lifelong learning

- 5.10. One method which can contribute towards filling skills vacancies is lifelong learning. The Draft NI Skills Strategy highlights that “*making a difference in the skills of our working age population will not be achieved unless real opportunities are afforded to individuals to upskill / reskill throughout their working lives*”. Indeed, **the disruption associated with the Covid-19 pandemic has highlighted the importance of lifelong learning**. In a fast changing and uncertain world lifelong learning can help individuals adapt and become resilient to external shocks, lowering their vulnerability.
- 5.11. The latest data indicates that **NI has the lowest proportion of people in employment receiving job related education or training of any UK region**. NI has recorded lower proportions of the workforce engaged in this type of learning consistently over time. In a tight labour market the ability to offer support to employees to upskill will be an important recruitment method, and there is currently a mismatch between employees and employers. For example, a recent survey by Resource Solutions<sup>21</sup> of UK professionals found that employees feel that two-fifths of employers do not prioritise upskilling within their organisation, whereas 98% of Generation Z and Millennial professionals were keen to upskill to future proof their careers.
- 5.12. Since 2020 there has been a reduction in numbers receiving job related education or training, with NI experiencing a much steeper fall relative to the UK. This data

<sup>21</sup> Resource Solutions (2021) UK Skills report.

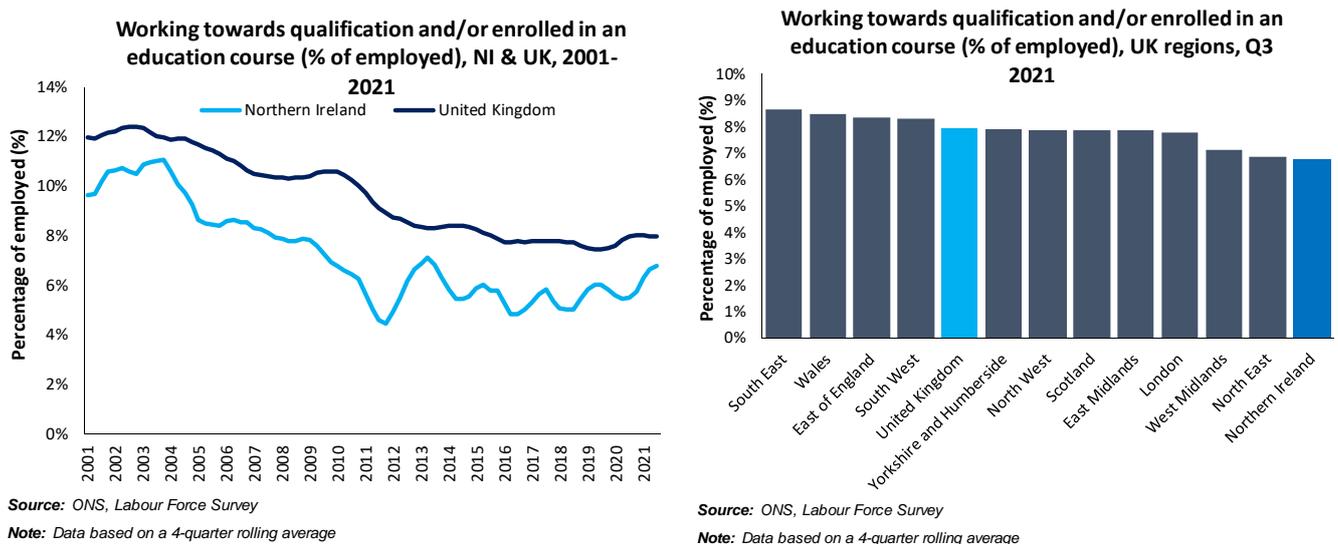
highlights a potential missed development opportunity for NI workers to accumulate further skills to assist career progression.

**Figure 5.6: Proportion of the employed receiving job related education or training (last 3 months), UK regions, 1996-2021<sup>A</sup>**



5.13. The proportion of people in NI who are studying outside of work has consistently trailed the UK. **The number of employed persons currently studying towards a qualification is the lowest of any UK region.** However, the gap to the UK is not as wide as that of job related education or training, and there has been a recent increase in activity.

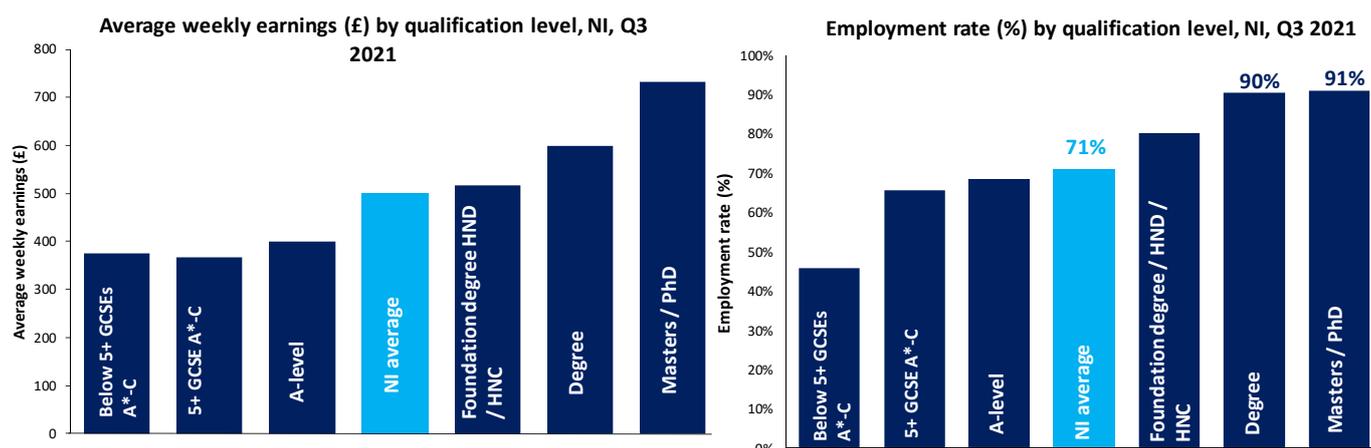
**Figure 5.7: Proportion of the employed working towards a qualification or enrolled in an education course, UK regions, 1996-2021**



5.14. While NI's education system is now producing more people with higher level qualifications than at any point in the past, it is important to remember that the labour market is comprised of people who have qualified from the education system over the previous 50 years.

- 5.15. A recent paper by the NI Productivity Forum<sup>22</sup> highlighted that NI's historical weakness in basic skills has made a significant contribution to the productivity gap. The evidence on the impact of raising basic skills is compelling, both for the individual and at the macroeconomic level. Research from the OECD PIAAC<sup>23</sup> study highlights that in England an increase in literacy proficiency of 48 points (the equivalent of one standard deviation) is associated with a 12% increase in wages. A separate report by the OECD<sup>24</sup> concluded that the economic gains that would accrue solely from eliminating extreme underperformance in high-income OECD countries by 2030 would be sufficient to pay for the primary and secondary education of all students.
- 5.16. In the local labour market there are significant differences in labour market outcomes based on qualification level. For example, average weekly earnings for someone with a postgraduate qualification are almost double that of a workers with a highest level of qualification below NQF level 2 (below 5 GCSE's A\*-C). The employment rate for degree qualified persons is over 90%, compared to just 45% for those with qualifications below level NQF level 2.

**Figure 5.8: Average weekly earnings and the employment rate (16-64) by qualification level (NQF), Q3 2021**



Source: Labour Force Survey  
 Note: Data refers to a 4-quarter rolling average to Q3 2021

Source: Labour Force Survey  
 Note: Data refers to a 4-quarter rolling average to Q3 2021

- 5.17. The relatively poor labour market outcomes for those with low qualifications highlights how individuals with low levels of educational attainment are increasingly penalised by today's labour market. In a rapidly evolving knowledge-based economy associated with global trends such as skills biased technical change, continued **lifelong learning opportunities for all are of critical importance across the entire labour market.**
- 5.18. The lowest qualified have fewer opportunities to participate in lifelong learning, and employers offer them less training in comparison to workers with higher qualifications. **A worker with a degree is three times as likely to be engaged in lifelong learning activities compared to a worker with prior attainment below NQF level 2.** These

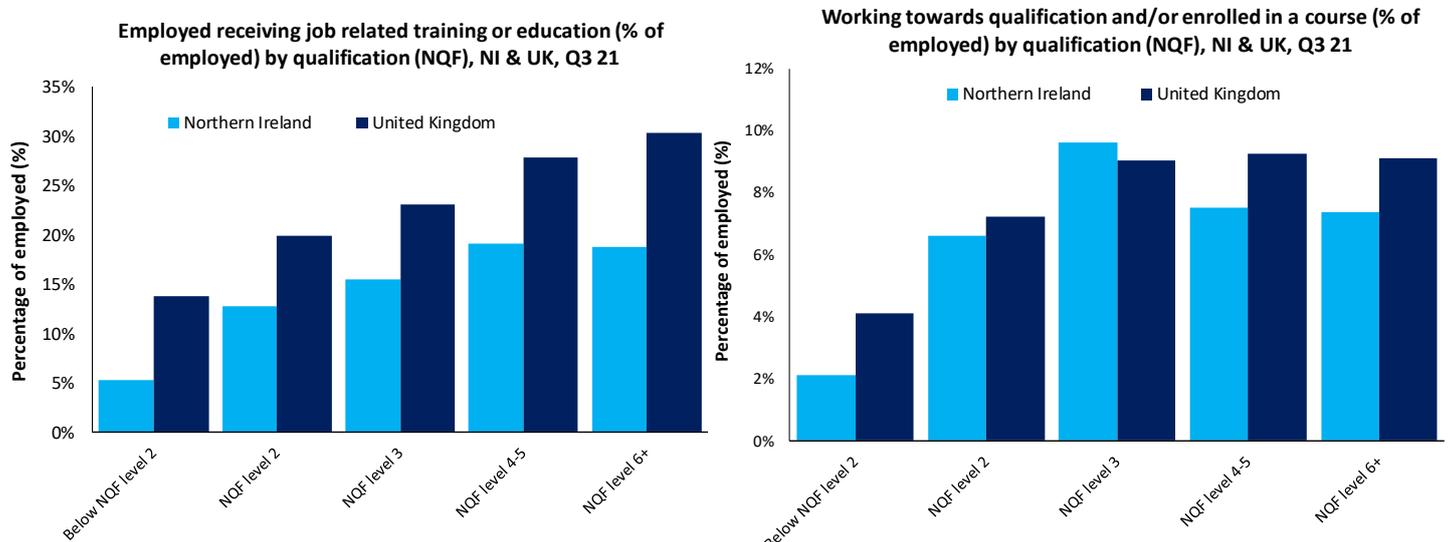
<sup>22</sup> D. Jordan, J. Turner (2021) Northern Ireland's Productivity Challenge: Exploring the issues. Working Paper No. 004, The Productivity Institute.

<sup>23</sup> OECD (2016) Skills matter: Further results from the Survey of Adult Skills. OECD Skills Studies.

<sup>24</sup> OECD (2015) Universal basic skills: what countries stand to gain.

differences can perpetuate a low skills trap whereby skills gaps from the education system are widened through the employment lifecycle. Narrowing gaps in access to skills development is an important component of any economic and skills strategy based on principles of inclusive growth.

**Figure 5.9: Proportion of the employed working towards a qualification or enrolled in an education course by prior attainment (NQF level), NI, Q3 2021**



Source: ONS, Labour Force Survey

Note: Data refers to job related training or education in the last 3 months

Source: ONS, Labour Force Survey

Note: Data based on a 4-quarter rolling average

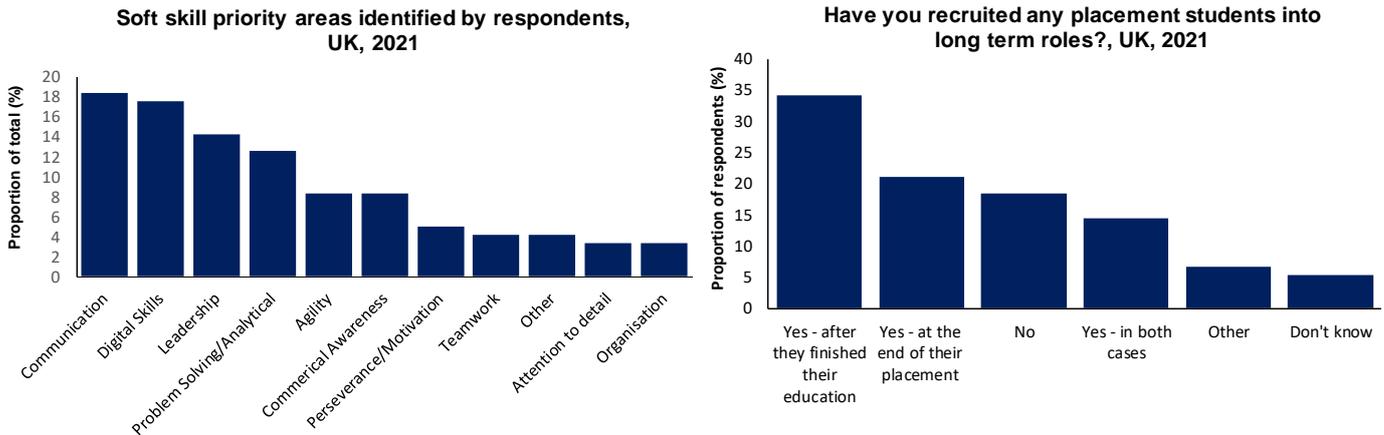
## Transversal skills

5.19. Transversal skills are those that are not specifically related to a particular job, task, discipline or area of knowledge and that can be used in a wide variety of situations and work settings<sup>25</sup>. In a rapidly changing world these skills are **key to accessing employment, career progression and becoming resilient to shocks**. A recent survey by Ulster University<sup>26</sup> highlighted that communication, digital skills, leadership, and problem solving/analytical were the most important soft skills identified by NI graduate employers.

<sup>25</sup> UNESCO (2021) Transferable skills – International bureau of Education. Available via : <http://www.ibe.unesco.org/en/glossary-curriculum-terminology/t/transferable-skills>

<sup>26</sup> Ulster University (2021) Graduate Employer Survey 2021. Available via: [https://www.ulster.ac.uk/data/assets/pdf\\_file/0011/984647/UU\\_GraduateEmployerSurveyReport-web.pdf](https://www.ulster.ac.uk/data/assets/pdf_file/0011/984647/UU_GraduateEmployerSurveyReport-web.pdf)

**Figure 5.10: Soft skill priority areas and work placement recruitment, Ulster University Graduate Employer Survey, 2021**



Source: Ulster University

Source: Ulster University

5.20. Firms struggling to find these skills has been a common finding amongst employer surveys in recent years. However, as transversal skills are difficult to measure, until recently there has been relatively little empirical evidence. The OECD<sup>27</sup> recently undertook an analysis of online job data using data from Burning Glass and found that **problem solving, people management, leadership and planning were amongst the transversal skills associated with the highest wage returns**. Whilst general sales, written communication and business process and analysis are amongst the skill requirements that are associated with the largest employment returns. The overall effects of transversal skills depended on the extent to which they bundled with other skills, highlighting that **simply possessing technical skills is not the only criterion for career entry and progression**. A separate study by researchers at the IFS found significant wage returns to soft skills amongst workers in low-qualification roles within innovative firms<sup>28</sup>.

5.21. One of the main routes to acquiring these types of skills is prior work experience. This includes both part-time jobs supporting full-time study and work placements linked to a student's area of study. This is perceived as a barrier by students themselves. A recent survey by Prospects found that the most common concern reported by students and graduates was 'having the required work experience for a job'<sup>29</sup>. The pandemic has had a negative effect on the number of students who are working, leading to large increases economic inactivity amongst full-time students. This will have a detrimental impact on the student's soft skills development and **enhances the importance of securing quality work placements and internships to enable catch-up**.

<sup>27</sup> OECD (2021) OECD Skills Outlook 2021: Learning for life

<sup>28</sup> Aghion, P, U Akcigit, A Bergeaud, R Blundell and R Griffith (2019), "The innovation premium to soft skills in low-skilled occupations", CEPR Discussion Paper 14102.

<sup>29</sup> Greaves, L. (2021) 5 student and graduate job-hunting pain points.

5.22. Work placements have always been an integral part of the skills system. However, with increasing demand for transversal and practical skills alongside labour shortages they have arguably become a more important pillar of recruitment and training. Ulster University's Graduate Employer Survey highlighted that **70% of graduate employers typically recruit students into longer term paid roles following culmination of their placement.**

### Key points

- Demographic projections indicate the potential for future labour shortages under a high growth scenario. Whilst this is not a new feature, there is limited scope to rely on 'catch up' in labour market participation to expand the labour supply over the coming decade.
- The extent to which migration will continue to contribute to fulfilling skills demand is uncertain. This has the potential to place pressure on sectors and occupations that had become typified by a high migrant intensity.
- Maximising labour force participation will be crucial to meet future skill needs. However, qualification differences between those in work and those out of work exacerbate the scale of the challenge.
- NI underperforms compared to other UK regions on lifelong learning measures. In a tight labour market learning opportunities linked to career progression paths will become important as firms compete for labour, and seek to retain existing talent.
- Transversal skills are increasingly demanded by employers alongside technical skills.
- Work placements demonstrate a very high re-recruitment rate, making a positive contribution to labour market matching.

## 6. Demand and Supply (Im)balance

6.0. This section seeks to combine the high growth demand and supply side analysis to identify areas of over and undersupply by NQF level and subjects in tertiary education.

### Introduction

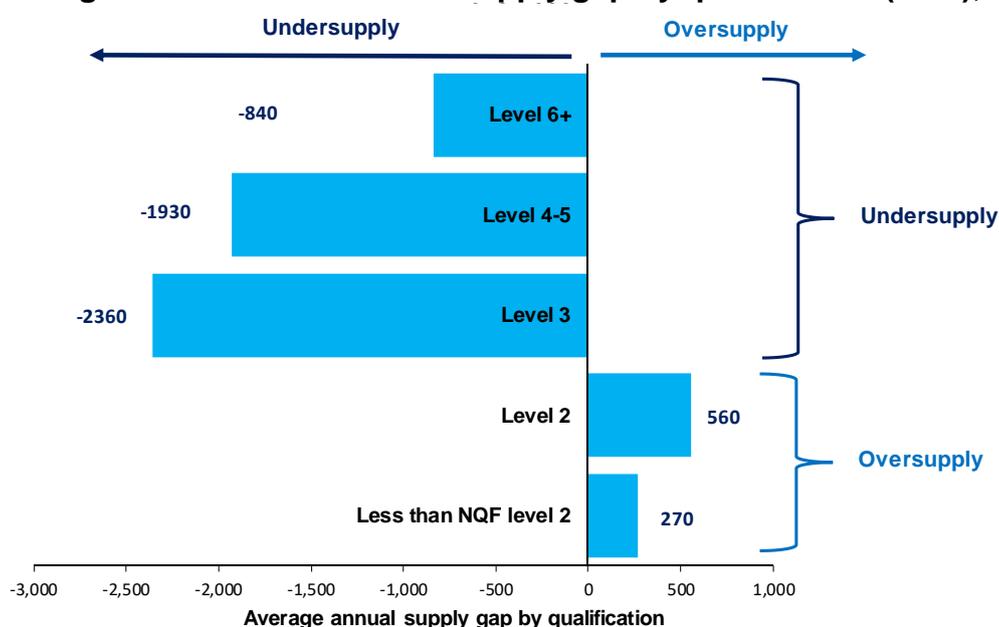
6.1. The supply/demand (im)balance or “supply gap” represents the net requirement of individuals from education and migration (demand) minus qualifiers from education institutions entering the labour market at a level on par with their qualifications (supply) i.e. demand net supply.

### Supply gap by qualification level

6.2. At the macro-level, the demand for skills in NI will outstrip supply but the nature of the skills gap varies across NQF levels. At lower NQF levels there is a slight oversupply. This is lower than in previous iterations of the NI Skills Barometer, and reflects the reduction in the number of people leaving the education system with very low levels of qualifications.

6.3. However, it should be noted that the balance of skills at NQF level 2 and below is sensitive to supply assumptions<sup>30</sup>. If attainment and enrolment patterns remain similar to 2020 over a longer period in the 10-year forecast, then there is a risk of an undersupply of labour for occupations traditionally associated with lower levels of qualification.

**Figure 6.1: Average annual labour market supply gap by qualification (NQF), NI, 2020-2030**



Source: UUEPC

**Note:** The supply gaps in the above chart have been calculated based on ‘effective supply’. This takes account of migration patterns amongst qualifiers at NI institutions and NI domiciled qualifiers qualifying from GB institutions, in addition to labour force participation. A supply adjustment is then applied to subtract tertiary qualifiers who require additional skills development to effectively fulfil the requirements of tertiary level employment. This group are not included in the above chart.

<sup>30</sup> UUEPC’s supply side forecasts assume that 2021 attainment and enrolment patterns will be similar to 2020, before returning to pre-pandemic patterns thereafter.

- 6.4. The largest supply gaps are likely to emerge in the mid-tier skills levels across most subject areas, linked primarily to a supply issue. NQF level 4-5 qualifications represent only 7% of the overall supply of labour from the education system. Addressing this undersupply could be met by either increasing the course offering and participation in mid-level qualifications at FE or increasing the number of apprenticeships which achieve at least mid-level qualification.
- 6.5. Using effective supply **there is a slight undersupply of labour at NQF level 6+**. Effective supply is a measure which accounts for challenges relating to employability skills, reflecting the fact that not all qualifiers with higher level qualifications have the necessary experience and wider employability skills to successfully access the available opportunities within high skill occupations (see Table 6.1 below).

**Table 6.1: Supply side concepts, NI Skills Barometer**

Supply side concept	Definition
<b>Gross Supply</b>	The number of qualifiers produced across all NI education institutions.
<b>Net Supply</b>	Refers to all students educated in NI institutions plus NI domiciled students returning from education at GB HEI's minus students educated in NI who then leave minus students who proceed to further study.
<b>Effective Supply</b>	This is calculated using the net supply but applies a 'supply adjustment'. The adjustment factor is applied at NQF level 4+ qualifiers from FE and HE. This adjustment is to recognise that a proportion of graduates and other qualifiers (NQF level 4+) require additional skills development before they would be capable of taking employment opportunities at a grade for which they are qualified.

- 6.6. There is a sufficient evidence base to justify this approach. The 2019 Employer Skills Survey<sup>31</sup> highlighted that **35% of NI firms identified an incidence of skills underutilisation** (employees with qualifications and skills more advanced than required for their current job role). Data from the Institute of Student Employers and the Graduate Recruitment Bureau indicated **a high proportion of employers use a 2:1 classification as a minimum entry requirement**. Industry consultations undertaken as part of this research also highlighted that **not all graduates were yet capable of filling high skill roles without further experience and development**. A finding confirmed by the 2021 CBI/Birkbeck Employment and Skills Survey<sup>32</sup> which reported around **one in five employers were not confident in their ability to meet entry level skill needs over the next three to five years through recruitment or training**.
- 6.7. There are undoubtedly graduates in NI that are unable to access graduate level employment. Data from the ONS highlights that in 2019 around **one in three UK graduates in employment were employed in non-graduate roles**<sup>33</sup>. The implication is that the undersupply at NQF level 6+ does not necessarily have to be met with an increase in supply. **The gap could be bridged by tackling the barriers relating to employability skills which are preventing some qualifiers from accessing graduate level employment.**

<sup>31</sup> Winterbotham, M., Kik, G. and Huntley Hewitt, J. (2020) Employer Skills Survey 2019: Developing the skills pipeline.

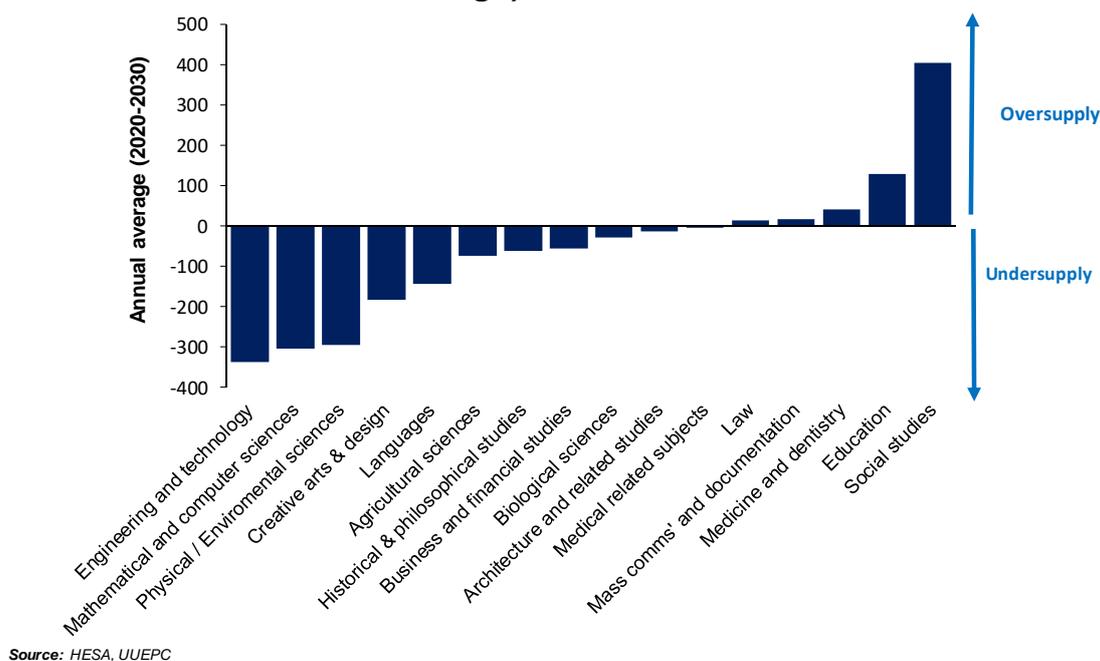
<sup>32</sup> CBI/Birkbeck (2021) Skills for an Inclusive economy. CBO/Birkbeck education and skills survey 2021.

<sup>33</sup> ONS (2020) Employed graduates in non-graduate roles, parts of the UK, 2015-19. Available via: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/adhocs/12501employedgraduatesinnongraduaterolespartsoftheuk2015to2019> [Last accessed on 18th December 2021].

### Supply gap by subject studied

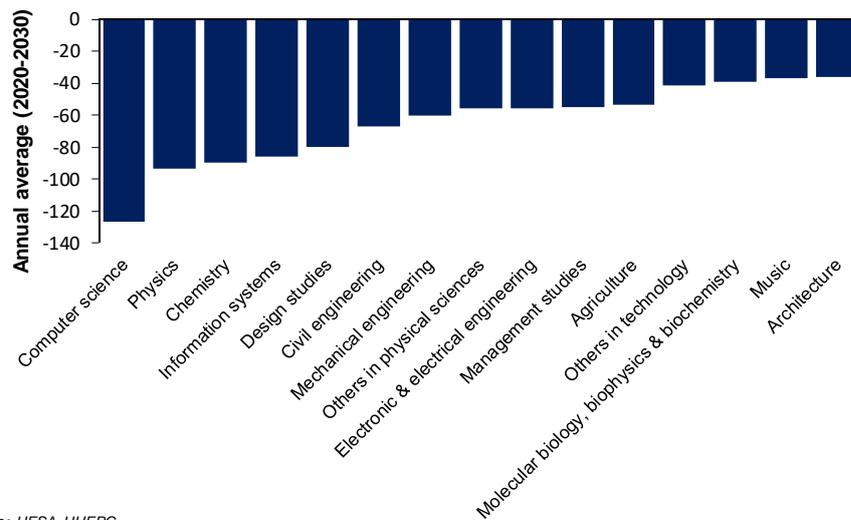
6.8. Whilst the number of graduates and post-graduates combined are slightly undersupplied, there is an imbalance across individual subject areas. In many subject areas the scale of under or over-supply is marginal and these areas should be considered as being broadly in balance.

**Figure 6.2: Average annual labour market supply gap by NQF level 6+ subject (JACS 1-digit), 2020-2030**



6.9. **The STEM related subjects are the most undersupplied, particularly Engineering & Technology, Mathematics & Computer Science and Physical/Environmental Sciences.** This is consistent with the findings in previous NI Skills Barometer iterations. The trend reflects the growth in the ICT, professional services and advanced manufacturing sectors in the high growth scenario driving demand for qualifications in computer science and engineering subjects. This is also evident when analysing supply gaps using more granular subject classifications. The largest supply gaps are recorded in computer science, physics and chemistry.

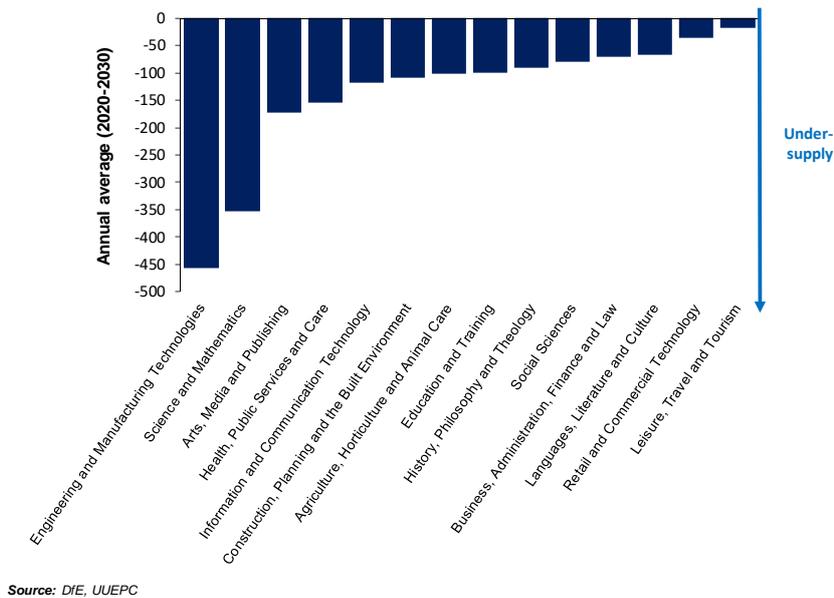
**Figure 6.3: Top 15 most undersupplied areas by NQF level 6+ subject (JACS 2-digit), 2020-2030**



Source: HESA, UUEPC

- 6.10. The largest oversupply is in social studies, which is a parent subject category to a wide range of subject areas (e.g. sociology, economics, politics, social work etc.). This is a large subject area and reflects around 8% of total demand for higher level qualifications, but accounts for 13% of the supply. Education remains an oversupplied subject category, but the scale of the oversupply has reduced in comparison to earlier iterations of the NI Skills Barometer.
- 6.11. An important point to note is that if a subject area is over-supplied, it does not necessarily mean that a young person should not study in that subject area, particularly if they have a strong interest or aptitude in the subject. However, it is important to communicate areas of over and under supply to young people **to ensure that informed decisions are made** relating to their chosen degree subject.
- 6.12. There are relatively **few qualifiers at NQF level 4-5 who enter the labour market**, which results in all subject areas being undersupplied. The most significant undersupply relates to engineering and manufacturing technologies and science and mathematics. This is driven by a high demand for STEM subject areas in sectors which are forecast to grow fastest in the UUEPC high growth sector such as advanced manufacturing and professional services.

**Figure 6.4: Average annual labour market supply gap by NQF level + subject, SSA 1-digit, 2020-2030**



### Key points

- A slight undersupply at NQF level 6+, this could be addressed by improving the employability of graduates (i.e. transversal skills and work placements).
- There is an undersupply of mid-level (NQF level 3-5) qualifications, reflecting a relatively small number of qualifiers at this level who transition to the labour market.
- There is a slight oversupply of low-level qualifications (NQF level 2 and below) over the next 10 years. However, if enrolment and attainment patterns remain at 2020/21 levels and migration flows to not return to pre-pandemic levels there is a risk of undersupply.
- There remains a subject imbalance at HE level, with undersupply in key narrow STEM subject areas (e.g. computer science, engineering, physical and environmental sciences).

## 7. Qualitative research

- 7.0. This section summarises high level findings from qualitative interviews undertaken as part of this research.

### Introduction

- 7.1. A wide range of employer groups and sector skills organisations were consulted to complement the quantitative forecasting work undertaken. In addition to providing comments on the quantitative analysis, qualitative comments were also made which provides a relevant context for any analysis of skills requirements. Key themes emerging from the interviews included:

- **Widespread labour shortages** - There are labour shortages in every area of the economy in the short-term, with shortages being particularly acute in sectors which rely on a pipeline of non-graduate labour. Pre-existing areas of skills shortage have been exacerbated by the recent increase in demand.
- **Experienced hires** - The recent increase in competition for available labour has led to a decrease in firm retention (i.e. an increase in job to job moves). This has created 'hard to fill' vacancies for mid-career professionals in certain occupations.
- **The cost of shortages** – Several interviewees expressed concern that skills shortages were causing businesses to alter their growth plans. An inability to secure talent has caused firms to hold back on investment plans, putting future growth at risk.
- **Soft skills** - Businesses highly value individuals with soft skill qualities (e.g. problem solving, attitude to work etc.). In many industries these are considered to be more important than qualifications, and even in technical occupations transversal skills are considered to be of equal importance. Several respondents mentioned the importance of work experience and work-based learning in the education curriculum to encourage the development of these skills and improve employability.
- **Digital skills** - Covid-19 pushed many businesses forward in the digital skills arena (e.g. websites, online bookings, social media etc.), many supported by available grants. A number of respondents suggested that this type of assistance should continue to support the digital development of businesses. Digitisation is occurring across the economy and is increasing demand for individuals with digital skill sets, from basic digital skills and competencies through to advanced artificial intelligence and machine learning.
- **Upskilling** – All respondents recognised the benefits of upskilling. Lifelong learning is essential for a prosperous future economy and must be encouraged from a young age through the education system, and for those already in the workplace through business providing learning opportunities. However, in micro businesses and small and medium sized enterprises investment in upskilling initiatives may not be viable due to resource and financial constraints.

- **Apprenticeships** – Respondents were generally very positive in relation to the apprenticeship scheme. In particular, the provision of Higher-Level Apprenticeships was welcomed. However, while positive experiences were reported most indicated that they had only experience with small numbers and it is too early to make a decision on how important a recruitment pillar the scheme will be over the medium to long term. Some respondents did indicate that the scheme creates an additional administrative and training burden, and that services such as brokerage or sectorally managed apprenticeships may be worth consideration. It was also noted that issues of scale created problems for SME's to engage in the apprenticeship programme.
- **Work placement** – Businesses are increasingly seeing placements as an integral part of their recruitment strategies. A variety of benefits are recognised including reducing recruitment and training costs, securing talent at an early stage within a competitive environment, and the contribution made as a team member during the placement year.
- **Careers advice** – Feedback on the perceived quality of careers advice was mixed. Suggestions to improve careers advice ranged from more industry involvement to a centrally managed careers service. A consistent theme was to ensure careers advice was based on labour market intelligence to enable students to make informed choices.
- **Sector attractiveness** – Respondents recognised their own responsibility in making their sector appear attractive to young people. It is important that the wide variety of opportunities that exist within individual sectors are effectively communicated to students through careers advice (e.g. jobs that cut across sectors such as sustainability and green growth).
- **Industry input to the education system** – Employers do consider that they should have a higher input into the design and delivery of education courses in NI. While some employers did report having strong relationships with individual institutions relating to the provision and delivery of courses, this was ad hoc rather than formalised. There was potential for industry to have a greater input on a more formalised basis across the whole education system rather than based on individual relationships.

7.2. More detailed feedback from industry representatives is included in the Skills Barometer information pack accompanying this summary report.

## 8. Summary, policy remarks and further research

8.0. In many cases this research quantifies previously known findings, and longstanding challenges from education and skills research. However, in other cases new issues and challenges are highlighted for the decade ahead. The main conclusions and policy remarks from this research are summarised in the bullets below:

- **The recovery period** – The future of work has been altered significantly by the events of the past two years. Varying sector growth prospects and shifts in working patterns have accelerated some existing labour market trends and created emerging patterns among the workforce. As the pandemic subsides and the economy moves through the recovery period it is important to continue to ambitiously plan on an aspirational basis, despite short-term uncertainties.
- **The importance of replacement demand** – In the recovery period job creation in the economy is expected to slow, relative to previous forecasts and recent historic trends. However, it is important to recognise a plentiful supply of job opportunities will continue to be available through the natural churn of the labour market (e.g. job to job movers, movers to retirement, movers to sickness etc.). Replacement demand accounts for the majority of job opportunities available to education leavers and migrants over the coming decade.
- **Every job matters** – Since the NI Skills Barometer was initially published in 2015 the research has emphasised the contribution that all jobs across the skills spectrum make to the economy, and that it is important that society places a value on all employment opportunities. The profile of job opportunities created via replacement demand are a function of the structure of the existing economy. Therefore, sectors and occupations do not necessarily have to be growing rapidly in order to provide a plentiful supply of career opportunities. It is important to ensure this point is included in careers advice to encourage students to consider working in a wider range of sectors and occupations.
- **A changing skills supply** – A feature of the education system in recent years has been a major expansion in education participation and attainment. People have been spending more time in education, participating in longer and higher NQF level courses, delaying their entry into the labour market. Much higher rates of education retention and attainment have been recorded during the pandemic, contributing to short term labour shortages which are particularly pronounced at NQF level 3 and below.
- **A permanently higher skills stock** – Higher levels of education attainment is a long-term trend in the labour market. For example, the proportion of people in employment with a highest qualification below NQF level 2 has fallen from 31% to 15% within the past 15 years. Employer expectations have adjusted to a higher qualified labour supply, creating a difficult labour market for new education leavers with low level qualifications.
- **The missing middle** – Earlier iterations of the NI Skills Barometer have identified an unbalanced skills supply, with few sub-degree level qualifications providing

direct transitions into the labour market. This remains a feature, with many of the qualifiers in sub-degree programmes proceeding to further study rather than entering the labour market. Undersupply in this area could be met by either the development of new courses for in-demand subject areas with close employer links, or by expansion of higher-level apprenticeships. There is a competitive strength in having a diverse education offering by enhancing student choice and providing the labour market with a wider range of professional and technical skills.

- **The need to oversupply** – Overall the number of graduates entering the labour market each year is broadly in balance. However, there is a need to oversupply higher level skills to reflect three labour market realities. Firstly, many qualifiers move into sectors different from their area of study. This creates issues in technical subject areas where vacancies cannot be filled by qualifiers in other subject areas. Secondly, numerous employer surveys have identified issues regarding the work readiness of recent recruits. Thus, a proportion of qualifiers will require additional skills development before they are capable of securing employment at a level equivalent to their qualification. Thirdly, some qualifiers voluntarily move into employment that is considered below their skill level (e.g. to secure flexibility). Once a supply adjustment has been made to reflect the imperfect nature of matching labour demand to education supply, there is a slight undersupply of graduates over the next 10 years.
- **Responding to undersupply** – The options to address an undersupply of higher-level skills extends beyond simply increasing student numbers. For example, one option is to place an enhanced focus on qualifiers who are lacking employability skills or sufficient work experience to access the available opportunities. This has the benefit of increasing the supply of higher-level skills whilst simultaneously reducing the number of people who are overqualified for their job.
- **Mobility of graduate flows:** The proportion of HE students studying within their domicile is relatively high in NI. However, NI fails to attract significant talent from elsewhere to study at NI HEI's, and the number of those who remain in NI post-graduation is relatively small. This results in NI being the largest net loser of high skilled labour amongst UK regions. Encouraging more students from the UK, Ireland and further afield to study in NI, would make a meaningful contribution to the labour market if an appropriate proportion remained in NI to live and work post-graduation. Ultimately, changing these flows is not simply a matter of raising the student cap on NI HEI's. Making NI an attractive place to live and work is a function of the economic, political and social environment which is difficult to change over the short-term.
- **HE subject balance** – Over two-fifths of HE qualifiers are within three subject areas: medical related subjects, business and financial related studies and social studies. This is a high concentration of graduates within a narrow range of subjects. Although there is an effective overall undersupply of graduate level qualifiers, there are challenges around the subject mix of qualifiers. For example, there is an oversupply of social studies and education qualifiers and an undersupply of engineering and technology and computer science qualifiers. Subject imbalances are costly for both the individual and employers. For an individual, an inability to develop a career in their subject of choice. For the employer, labour shortages can

lead employers to reign back on growth plans. Achieving an appropriate balance across subject areas will be essential for a prosperous and productive labour market moving forward.

- **STEM subject demand** – The undersupply in many of the narrow STEM subjects has been a continual theme throughout NI Skills Barometer publications. A key challenge in meeting the demand is to address the lack of females studying and qualifying within narrow STEM related subjects. For example, almost two-fifths (36%) of male HE qualifiers are within narrow STEM subjects, compared to just 16% of females. If the NI education system is to meet the required demand for narrow STEM over the next decade it must significantly increase the number of qualifiers within these subject areas, and in particular encourage young women to study within these areas.
- **Labour Market Intelligence (LMI)** – The importance of developing policy based on LMI remains imperative. NI is still without published data on Longitudinal Education Outcomes (LEO) which is essential for demonstrating labour market returns to qualifications which can be tracked over the life course. The data would also provide an invaluable resource to provide insight on under employment of graduate skills. Similarly, there is a need for high quality longitudinal information on FE qualifications. This would represent an important evidence base to demonstrate the value of alternative pathways to HE.
- **Flexibility to respond to changing demand** – The implications of the pandemic on jobs illustrated the ability of NI's education system to rapidly design and deliver formal courses across a range of qualification levels for priority areas (e.g. software development, data analytics, cyber security, leadership and management). This pragmatic approach to delivering courses within areas of high-demand should be maintained moving forward. As NI is a relatively small region, a small flurry of inward investment announcements could alter the education requirements over a short period. Maintaining an agile, and responsive education system is essential for responding to rapidly changing demand.
- **Mitigating risks** – Sector growth should be tracked against the high growth scenario forecast and used as an 'early warning system'. If a sector is continually growing above the rate expected in the high growth scenario (recall this is a highly ambitious scenario used for skills planning) it could be a sign that the education system needs to quickly respond, or policy makers must consider ways to attract inward migration for vacancies.
- **Contingency planning** – It is well reasoned to ambitiously plan for skills for the future. Indeed, the skills shortages reported in 2021 have highlighted the need to plan using a high-growth scenario as skills undersupply can hold back growth. However, it would be remiss not to have contingencies in place in the case of weaker economic growth or an economic downturn. The high-level results for a more modest baseline economic scenario are included in Annex A, with more detailed analysis included in the Skills Barometer information pack which accompanies this report.

- **Migrant labour uncertainty** – The number of non-UK nationals applying for a National Insurance Number (NINo) has been declining since the Brexit referendum result in 2016. However, applications have been significantly impacted by the pandemic, whereby travel has been restricted for most of the last two years. With the combined effects of post-Brexit migration arrangements alongside a potential long-tail of Covid-19, there is considerable uncertainty whether migrant flows will return to their pre-pandemic state. In at least the short term this will continue to contribute to labour shortages across industries reliant on migrant labour.
- **Demographic transition** – The demographic profile of the future workforce is an important factor in forecasting job growth. The identified skills shortages have been aligned to strong demand and a reduced proportion of education leavers entering the labour market. However, changing demographics will also exacerbate skills shortages over the longer term. The working age population is expected to change only marginally over the coming decade. Under a high growth scenario this has the potential to generate labour supply shortages.
- **Planning for participation** – Without the demographic dividend NI has enjoyed in previous decades, and limited scope for expanding the labour supply through ‘catch up’ effects in female economic activity, increasing labour market participation will play an important part in meeting future skill needs. This will require significant increases in underrepresented groups in the labour market such as the disabled, the long-term sick, carers, people with low qualifications and older people. There are many barriers to improving the employment rate of these groups, and it will require policy intervention alongside a cultural change amongst employers to embrace the flexibility required to access these untapped labour reserves.
- **A culture of learning** – NI tends to underperform relative to the UK on lifelong learning measures. Lifelong learning is based on strong foundation skills and a willingness to learn to build a habit of learning over the course of a working life<sup>34</sup>. Those with prior attainment tend to have higher participation in lifelong learning activities, which can deepen inequalities that have accumulated during formal schooling. There are barriers to lifelong learning from the individual, where there is often<sup>35</sup> an unwillingness to participate in such opportunities. From the employer side, a cultural change is also required. There are understandable barriers to training and supporting employee’s independent learning activities, notably time and financial barriers. However, in a rapidly changing world, skills during formal education or in prior employment become obsolete more quickly. Therefore, lifelong learning activities become an essential instrument in addressing NI’s competitiveness challenges<sup>36</sup>. The policy approach to lifelong learning should recognise that barriers are often interrelated and should not be approached in isolation. For example, long run initiatives designed to reduce inequalities and improve attitudes to learning in the early years can arguably be more effective than short-term employer incentives.

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<sup>34</sup> Kautz, T. (2014) Fostering and measuring skills: Improving cognitive and non-cognitive skills to improve lifetime success, NBER working paper.

<sup>35</sup> The OECD Survey of Adult Skills (PIAAC) highlights that approximately two-fifths of the UK adult population had disengaged from learning opportunities.

<sup>36</sup> UUEPC (2021) Addressing NI’s competitiveness Challenges.

- **Transversal skills** – These cross-cutting skills are increasingly reported in employer surveys as important factors in recruiting education leavers. The pandemic has undoubtedly enhanced the value of soft skills as blending work arrangements have heightened the need for workers to be digitally competent, flexible and adaptable, strong communicators as well as independent personally responsible individuals. Recent evidence has highlighted the positive wage and employment effects from an accumulation of transversal skills, with particularly positive effects when these skills are bundled alongside technical skills.
- **Digital skills:** The demand for digital skills has been stressed during qualitative consultations, and is supported by the modelling analysis. The demand for digital skills can be deconstructed into three components. Firstly, demand from the IT sector. As jobs in this sector are technical and require high level software and programming skills, it is difficult to recruit from non-IT backgrounds for these roles. Therefore, a lack of supply can hold back sector growth. Secondly, there has been significant growth for digital skills across all other sectors. There are sectors which have traditionally created a high number of digital roles such as financial services, professional services and the creative industries. However, there is now also significant demand for IT professionals in sectors not previously associated with a demand for IT graduates as firms undertake digital transformation across an increasing number of business functions. Thirdly, most roles, and wider society, now require digital competency. This does not create additional demand for IT graduates, but implies that digital skills must be incorporated across all subject areas in the education system.
- **Importance of work experience** –The value of work experience cannot be understated, increasingly employer surveys highlight the value in recruiting those with relevant working practice. However, the pandemic has made it more challenging for students to gain relevant work experience opportunities. Further, the pandemic had a particularly negative impact on many of the sectors where students find part-time employment (e.g. hospitality, retail). Part-time work is often where students begin their development of soft skills (e.g. team work, communication, professionalism). A reduction in placements and internships alongside a weaker economy for part-time jobs will compound the negative impact on the perceived employability skills for education leavers over the short-term.

8.1. The completion of this research has highlighted a range of policy areas which require further research. These include:

- **Short-term skills measurement** –The NI Skills Barometer is designed for long-term future skills planning and brings to the fore high-level industry shifts and associated requirements. However, there is merit in more regular research to compliment the NI Skills Barometer to gauge skills experiences from industry and enable early detection of skills issues. The existing published data does not support more regular updates of the NI Skills Barometer model (e.g. most supply side data used is only published annually), and would likely require primary research (e.g. a regular vacancy survey).

- **Skills Barometer model** – The skills model underpinning the NI Skills Barometer research was designed in 2015, and has facilitated four NI Skills Barometer reports published at two year intervals. However, the underlying data will have changed significantly in two years' time. For example, the subject classification for subjects will have transitioned to a new framework, and the type of data collected at HE and FE will have changed to a new methodology using the Graduate Outcomes Survey. Therefore, the model will require significant adjustments and it may be more appropriate to develop a fresh model. This will provide opportunities for scoping to provide further data in future Skills Barometer publications such as differentiating between undergraduate and postgraduate demand, development of subject metrics below tertiary level, apprenticeship demand and upskilling activity.
- **Labour market tightness** – This report has highlighted short term labour pressures and sources of constraints on labour supply over the longer term. Therefore, research to understand the quantum of spare capacity available in the labour market, and the profile of people with excess labour supply (i.e. the unemployed, hidden unemployed and underemployed) would be a useful addition to the research base. It is important to better understand the mismatches that exist between labour demand and those currently out of work.
- **Enhancing participation** – The data analysis has highlighted the importance of increasing labour market participation moving forward. Further labour market intelligence relating to key groups such as older workers and the disabled is needed to provide appropriate baseline information to inform policy.
- **The migration gap** – The labour market impact regarding migration flows is highly uncertain. Net migration is down, driven largely by reduced inflows. It is uncertain if and when patterns will return to a pre-pandemic state. Therefore, it is important to maintain up to date information relating to migration tracking the types of roles that are typically filled to identify areas of potential shortage.
- **Pandemic qualifiers** – Education qualifiers during the pandemic provide the opportunity for a unique case study. This is the first group to transition through the education system with final results being based on teacher assessment. This has resulted in higher levels of academic achievement, providing additional options for qualifiers and encouraging an increase in the length of formal education. The long-term labour market outcomes for this group should be tracked longitudinally and compared against earlier cohorts to assess the impact of this method of assessment.
- **Home schooling** – School pupils have had their education significantly disrupted during the pandemic, and this has implications for future inclusive growth. Learners with sufficient motivation are more likely to have remained fully engaged in learning during home schooling<sup>37</sup>. The absence of a teachers supervising learning behaviours alongside a lack of peer effects may have prompted more vulnerable students less suited to self-directed learning to pay less attention during instruction. The education of home schoolers will have varied from household to household.

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<sup>37</sup> Ivani et al (2020) Digital transformation of everyday life – How the COVID-19 pandemic transformed basic education of the young generation, and why information management should care? *International Journal of Information Management*, Vol 55.

Recent international research has highlighted that less educated parents have been less supportive of their children's efforts during lockdown partly because they feel less able to help<sup>38</sup>. Therefore, there exists a risk of existing socioeconomic disparities being widened by periods of home schooling. It will be essential to develop new methods of data collection and research to identify more vulnerable groups, and to highlight effective methods to aid the design of policies to support children at risk of falling behind.

- **Training and adult learning** – High-level trends relating to lifelong learning have been presented in this report. However, there is a need for further analysis to develop an evidence base to inform policy. For example, understanding the sector and occupation differences, and participation of different socioeconomic groups in lifelong learning activities.
- **Careers** – Strong views were expressed during qualitative interviews regarding careers advice. However, much of the feedback was either anecdotal in nature or based on personal experience. This suggests a lack of knowledge regarding the structure of careers advice provided across NI education institutions. Industry perception may improve with greater transparency of the programme of careers guidance provided. A wide range of suggestions relating to potential reforms were provided during consultations ranging from greater industry involvement to a centrally managed independent careers service. There may be merit in undertaking a policy benchmarking exercise from elsewhere to identify international best practice regarding careers advice, and gaining stakeholder buy-in for any planned reforms.

8.2. Achieving success across all aspects of the education and training system is an extremely difficult challenge. The Skills Barometer is one resource that can be drawn upon, alongside many others, to inform policy. More detailed presentation of Skill Barometer modelling outputs is provided in the PowerPoint information pack which accompanies this summary report. This information should be utilised by policy officials, teachers, students, careers advisors and employers. It is important that stakeholders across the education and training system move forward with a common vision to develop policy that will equip individuals across NI with the skills to succeed.

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<sup>38</sup> Bol (2020) Inequality in home schooling during the corona crisis in the Netherlands. First results from the LISS panel.

## Annex A: Baseline scenario

A.0. This section aims to compare key results from the assessment of future skills demand between the baseline scenario and high growth scenario.

### Introduction

A.1. UUEPC produces regular economic forecasts for NI under three scenarios: lower scenario; baseline scenario; and high growth scenario. The forecasts under the baseline scenario outline the ‘most likely’ economic outcome for NI. The economic outcomes under the high growth scenario are highly aspirational, aligned to NI achieving its economic ambitions (e.g. stronger growth in 10X cluster sectors).

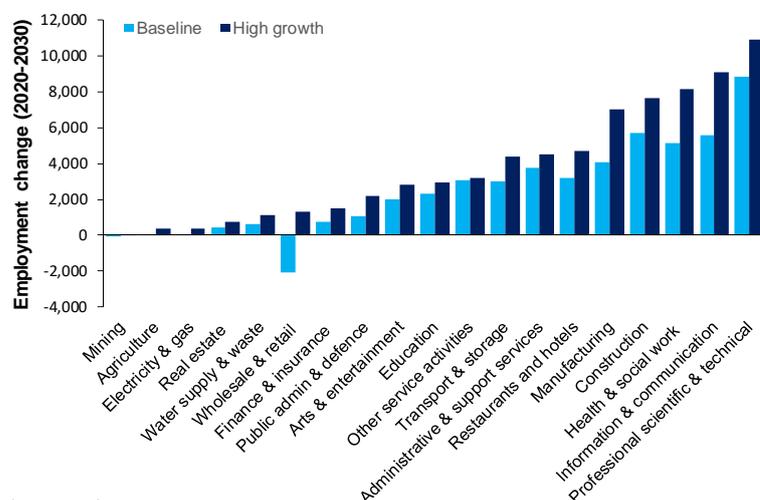
A.2. Policy intervention to improve skills planning should be developed on an aspirational basis to avoid future skills shortages. However, it is important to be cognisant of the outcomes under a scenario where economic conditions do not align to aspirations. This allows for development of contingency planning to mitigate the impact of a potential skills oversupply.

### Assumptions under the baseline scenario

A.3. UUEPC’s baseline scenario estimates the NI economy will create 4.8k additional jobs per annum over the next decade (2020-2030). That compares to an actual job creation of 14.5k per annum over the period 2012-2019. The baseline scenario’s weaker growth outlook is linked to a more prolonged post-pandemic recovery, supply bottlenecks and labour shortages. In comparison, the high growth scenario forecasts job creation of 7.3k per annum over the decade, 2.5k per annum above the baseline.

A.4. The sectors expected to create the largest quantum of jobs under the baseline scenario are professional services (8.8k), construction (5.7k) and ICT (5.6k). The sectors with the largest differences between the baseline scenario and high growth are ICT (-3.5k lower in the baseline scenario), wholesale and retail (-3.4k) and health and social work (-3.0k).

**Figure A.1: Employment (jobs) by sector (SIC, 1-digit), baseline versus high growth, NI, 2020-2030**



Source: UUEPC

## Labour demand under the baseline scenario

- A.5. The composition of job growth drives labour demand by across sectors, occupations, qualification levels and subject areas. Under baseline conditions gross demand (80.6k) is 4.1k per annum lower than gross demand under the high growth scenario. A lower expansion demand under the baseline conditions (associated with the most likely economic outcome) explains the majority variance between the two scenarios.
- A.6. Expansion demand is on average 2.4k per annum lower under baseline conditions, compared to the high growth scenario. Job opportunities filled within the existing labour market component of gross demand explains only a small proportion (0.4k) of the difference, driven by the structure of an economy, which changes slowly over time.

**Table A.1: Components of demand, baseline scenario versus high growth scenario, NI, 2020-2030**

Demand category	Baseline (2020-2030)	High growth (2020-2030)
(A) Gross demand	80,610	84,690
(B) Expansion demand	4,620	7,040
(C) Replacement demand	75,990	77,650
(D) Filled from within the existing labour market	55,640	56,030
(E) Net replacement demand	20,350	21,620
<b>(F) Net requirement from education and migration</b>	<b>24,970</b>	<b>28,660</b>

Source: UUEPC

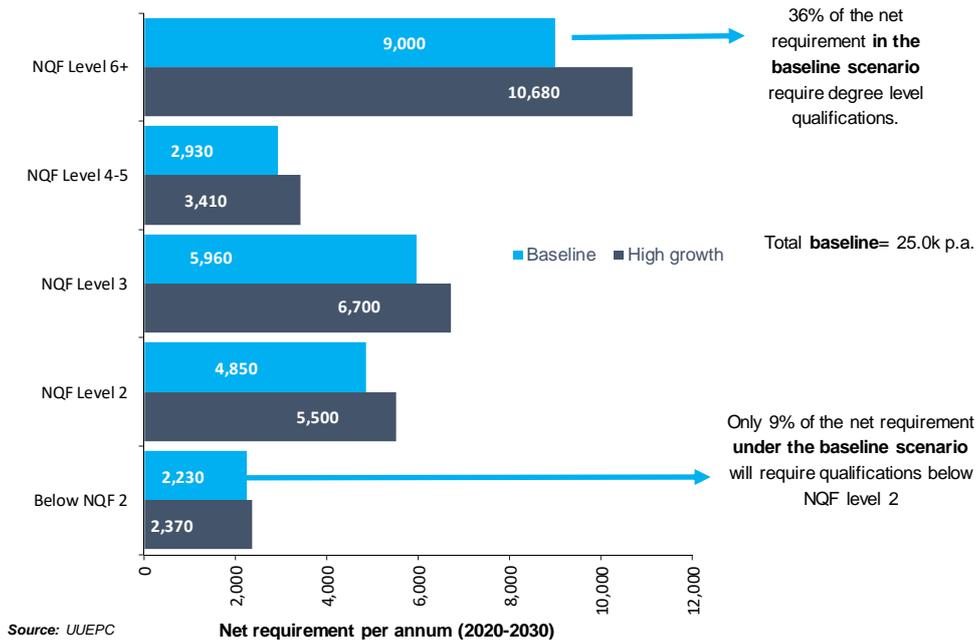
Relationship between rows:  $A=B+C$ ,  $E=C-D$ ,  $F=E+B$

- A.7. The net requirement under baseline conditions (25.0k per annum) is on average 3.7k per annum less than the high growth scenario (28.7k per annum), driven by the difference in expansion demand. For example, the expansion demand in the baseline scenario accounts for 19% of the net requirement, compared to 25% under high growth conditions.

## Qualification and subject demand under the baseline scenario

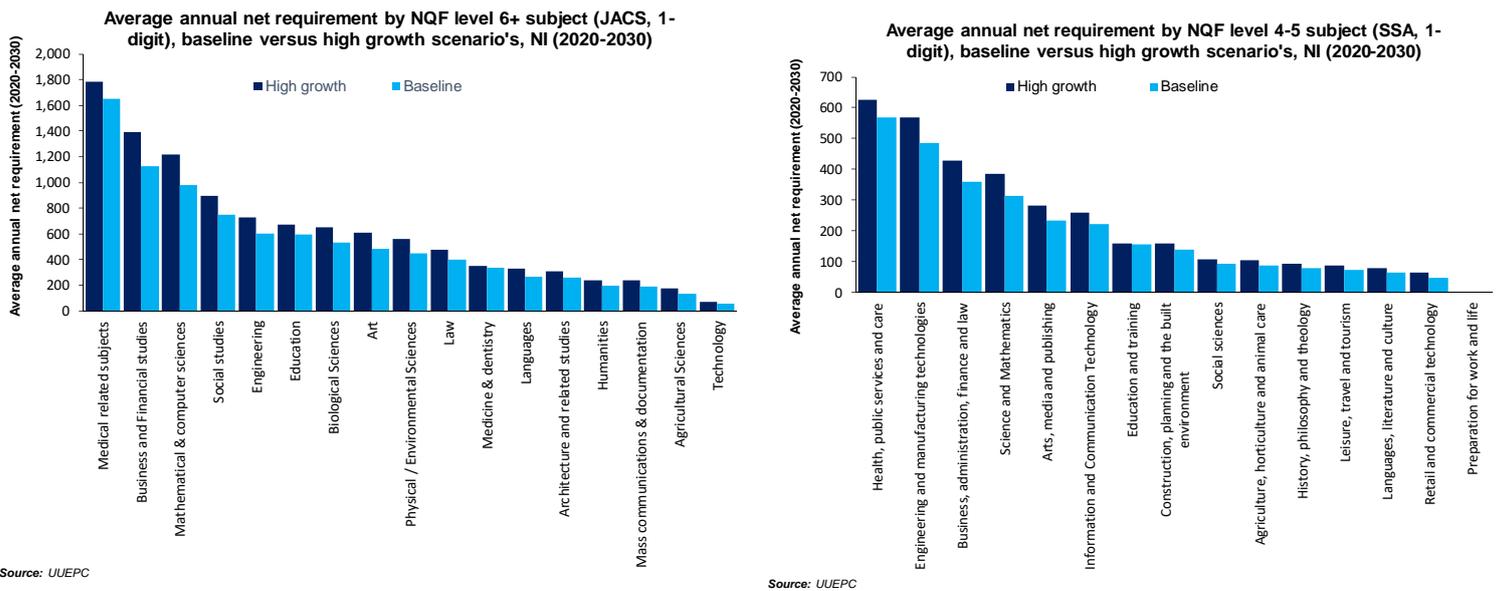
- A.8. The average annual net requirement by qualification level is also driven by the difference in expansion demand. For example, stronger growth in sectors with a high graduate concentration (e.g. ICT, financial services) drives a higher demand for graduate level qualifiers under the high growth scenario, relative to the baseline.
- A.9. Under baseline conditions, 36% of the net requirement will require degree level qualifications, compared to 37% in the high growth scenario. At the lower end of the qualification spectrum, almost one in ten (9%) of the net requirement will require below NQF level 2 qualification, compared to 8% in the high growth scenario.

**Figure A.2: Average annual net requirement by qualification level (NQF), baseline scenario versus high growth scenario, NI, 2020-2030**



A.10. The demand by qualification can then be split by demand for specific subject groupings for NQF level 6+ and NQF level 4-5 (this is not possible below NQF level 4 as individuals typically study a range of subjects at this level). Under baseline conditions the most in demand subject at NQF level 6+ is medical related subjects (1.6k per annum), followed by business and financial studies (1.1k) and mathematical and computer sciences (1.0k). These are the same top three subjects demanded under the high growth scenario, however under the high growth each has a stronger demand.

**Figure A.3: Average annual net requirement by subject (NQF level 6+ and NQF level 4-5), baseline scenario versus high growth scenario, NI, 2020-2030**



A.11. At NQF level 4-5 the composition of the most in demand subjects is health public services and care (0.6k per annum), engineering and technology (0.5k) and business

administration, finance and law (0.4k). Again, the same composition as those demanded under the high growth scenario, albeit marginally lower demand in absolute numbers under baseline conditions.

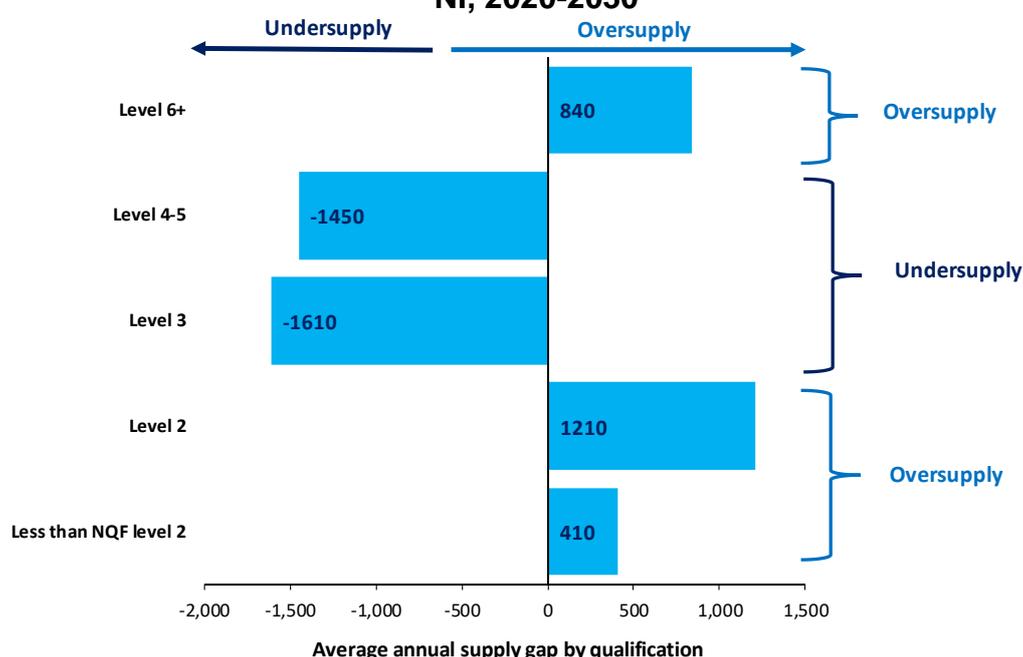
A.12. The variance in demand across subjects is driven by the sectoral outlook. For example, the subject with the largest difference in demand is business and financial studies (260 per annum fewer demanded under baseline conditions). This demand aligns to the professional service sector, which requires a high concentration of graduates and has relatively stronger growth in the high growth scenario.

### (Im)balance under the baseline scenario

A.13. The (im)balance (i.e. supply gap), calculated as net requirement minus leavers from education institutions entering the labour market, provides outputs at both qualification level and subject level.

A.14. The effective supply balance varies across qualification level under the baseline scenario. At NQF level 6+ there is an estimated effective over supply (0.8k per annum)<sup>39</sup>. This is different to the high growth scenario wherein an effective undersupply is estimated (0.8k per annum). Therefore, it is important there are measures in place to mitigate any negative impacts associated with an oversupply of graduates if baseline conditions were to occur.

**Figure A.4: Average annual supply gap by qualification level (NQF), baseline scenario, NI, 2020-2030**



Source: UUEPC

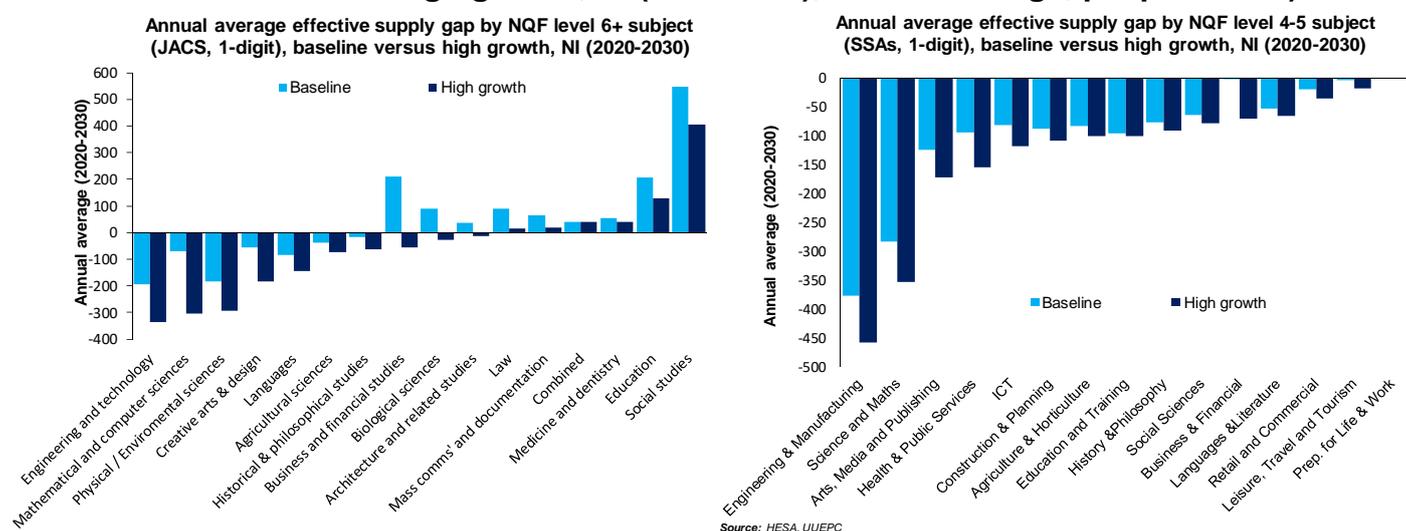
**Note:** The supply gaps in the above chart have been calculated based on 'effective supply'. This takes account of migration patterns amongst qualifiers at NI institutions and NI domiciled qualifiers qualifying from GB institutions, in addition to labour force participation. A supply adjustment is then applied to subtract tertiary qualifiers who require additional skills development to effectively fulfil the requirements of tertiary level employment. This group are not included in the above chart.

<sup>39</sup> In the absence of a supply adjustment, there would be an oversupply of 2.4k per annum. This would cause an increase in the number of graduates in 'non-graduate' employment.

A.15. At the mid-level (i.e. NQF level 3-5) there is an undersupply of qualifiers driven by supply trends. At the bottom of the qualification spectrum, NQF level 2 and below qualifiers are expected to be over supplied. The demand for qualifications across the economy will squeeze the opportunities for those at the bottom end of the qualifications ladder.

A.16. The (im)balance is reviewed at the subject level under baseline conditions. Although there is an oversupply at NQF level 6+, there are some subject groupings that are in undersupply. The most undersupplied subject is expected to be engineering and technology (-190 per annum) followed by physical and environmental sciences (-180) and languages (-80). Whilst the most oversupplied are estimated to be social studies (+550 per annum), followed by business and financial studies (+210) and education (+210).

**Figure A.5: Average annual supply gap by subject (NQF level 6+ & NQF level 4-5), baseline versus high growth, NI (2020-2030), annual average, people based)**



Source: HESA, UUEPC

Source: HESA, UUEPC

A.17. At NQF level 4-5 all subjects are considered undersupplied under baseline conditions. The most undersupplied is expected to be engineering and manufacturing (-380 per annum), followed by science and maths (-280) and arts, media and publishing (-120). This is the same undersupply composition as seen under the high growth scenario.

A.18. It is reasoned to continue to plan ambitiously for the skills base of an economy in order to maintain and prosper from international competitiveness. However, if the economic ambitions of an economy are not achieved it is important policy is cognisant of measures to mitigate against the risk of an oversupply in skills.

## About UUEPC

UUEPC is an independent research centre focused on producing evidence-based research to inform policy development and implementation. It engages with all organisations that have an interest in enhancing the Northern Ireland economy. The UUEPC's work is relevant to Government, business and the wider public with the aim of engaging those who may previously have been disengaged from economic debate.

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