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Young people in low level vocational education: characteristics, trajectories and labour market outcomes

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Abstract

Although 10% of school leavers in England start low level vocational education (normally below Level 2, 'BL2'), very little is known about the characteristics of learners, their participation in vocational education and their labour market outcomes.

Benefiting from large size linked administrative data for a full cohort of young people, we use sequence analysis methods to understand the similarities and differences in the biographies of young people who engaged in BL2 programmes initially, and create clusters of learners with similar biographies. As a result of our exploratory analysis, we find four main BL2 trajectories which can help policy makers target their interventions more efficiently: About 45% of all BL2 learners show a clear progression in college-based vocational education to programmes at higher levels, while 21% make a transition into a persistent NEET status, mainly from dropping out in year one. Another 21% move to sustained employment, mainly after their first year, sometimes after undertaking a Level 2 qualification. Progression to apprenticeships was achieved by 13%.

Another key finding is that achieving the low level qualification started by the age of 16 leads to better employment prospects and to higher earnings four years later. This suggests that policy should encourage and support adolescents' engagement until they successfully gain their (low level) qualification.

Keywords: vocational education, apprenticeships, progression routes

JEL codes: I21 (Analysis of Education), I24 (Education and Inequality), C55 (Large Data)

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Executive Summary

Background and objectives of this research

After leaving school, approximately 10% of 16-year olds start a vocational education qualification at very low levels of learning, comparable to qualifications usually taken in lower secondary education at age 11-14, i.e., “below Level 2”, BL2 henceforth. Although this is a sizeable group (around 65,000 school leavers in recent years), their participation in vocational education and labour market outcomes have so far been barely documented: a review of existing research points to gaps in evidence on their education and labour market trajectories. Also, the literature on the wage returns for low level vocational education offers often inconclusive and contradictory results.

This paper aims to address this gap by presenting descriptive evidence on the characteristics of learners in BL2 vocational qualifications, their learning activity post compulsory education and labour market outcomes. We exploit newly available linked administrative data at individual level from the National Pupil Data (NPD), Individualised Learner Records (ILR) and employment data from Her Majesty’s Revenue and Customs (HMRC) records. The dataset then includes complete longitudinal data for a cohort of BL2 learners, regarding their education and employment activities for the first three years after leaving secondary school (census-level). Our analysis engages with an ongoing academic and policy debate on helping young people to make better school-to-work transitions (see for example the recent report by the House of Lords Select Committee on Social Mobility ‘Overlooked and Left Behind: improving the transition from school to work for the majority of young people’).

Descriptive analysis of BL2 learners

The analysis is first contextualised with a description of BL2 learners in comparison to other groups leaving secondary education to different destinations. At the end of compulsory schooling, the majority of secondary school leavers engage in academic learning (57.3%), i.e. in (mainly) A-Levels, Applied Generals, Tech Levels or Other Vocational Level 3 qualifications. A small percentage (2.8%) start an apprenticeship and 12% engage with Level 2 qualifications outside of apprenticeships.

Our data follow the cohort of school leavers who completed compulsory school in the summer of 2011. Our focus is on those enrolled in BL2 programmes in September 2011, a group representing around 10.3% (65,800) of those leaving secondary school that year. Their performance at the end of compulsory school exams (GCSE) is very weak: 96% of BL2 learners have not achieved five A*-C GCSEs. In addition, 69% of them do not achieve a single GCSE A*-C. This is higher than for other groups of people leaving Key Stage 4 (KS4), including those starting employment (49%) or classed as Not in Employment, Education or Training (‘NEET’, 61%). The characteristics of the BL2 programmes tend to be similar to each other: most programmes require between 300 and 400 Guided Learning Hours (GLH) overall, of which 200 and 300 GLH are devoted to the main subject. The main subject for about a third of all young people is Preparation for Life and Work, which focuses on personal and social skills for the purpose of personal growth and further engagement in learning.

Progression after initial BL2 course

Analysing the education and labour market participation of the BL2 learners in September 2012, September 2013 and August 2014, we find significant progression in education by the

BL2 learners. About half of the BL2 learners start a course at Level 2 after one year: 27% to Other Level 2 vocational programmes, 10% to Tech Certificates (Level 2) and 6% to Intermediate Apprenticeships. An additional 3.2% are enrolled in Level 3 programmes. While 7% can no longer be observed in any of the records, 12% are reported to be NEET, 7% employed and not in education and 26% remain at BL2 level. Two years after the start of their BL2 programme, 50% of the original cohort is still observed in learning, 17% are engaged in Level 3 programmes, and 22% in Level 2 programmes. The employment rate outside education for the initial participants increased to 20% and another 18.9% are recorded as NEET. After three years, 20% of the people have progressed to (mainly) Level 3 programmes: 6.1% are in apprenticeships, 5% in Tech Levels and 2.5% in Advanced Apprenticeships. Employment outside of education has increased to 40% and the NEET rate remains around 20%.

Typology of learning trajectories

Using sequence and clustering analysis we derive a data driven typology of BL2 learners in terms of learning and labour market participation:

- 44.8% of all BL2 learners show a clear progression in college-based vocational education (VE) to programmes at higher levels in the second and third year at college;
- 21.2% make a transition into a persistent NEET status, mainly from dropping out in year one;
- 21.1% move to sustained employment, mainly after their first year, sometimes after undertaking a Level 2 qualification
- 12.9% progress to apprenticeships during, but more substantially after, their first year at college.

We found that nearly 80% of all BL2 learners make successful transitions to employment, higher level VE, or apprenticeships during the first 36 months after leaving secondary school. On the other hand, there is also a large group of young people dropping out of education, and being reported as NEET (around 21%). Although the transition from BL2 to NEET during the school year is significant, in particular from courses with a duration shorter than one year, the great majority of young people follow consistent patterns of participation in education until the end of the year, and then remain in vocational education for an additional year or more. In summary, we find a comparatively stable participation pattern is identified for the majority of BL2 learners over the 36 months after KS4.

Educational achievement at 19

By September 2014, over half of the BL2 learners achieved a qualification at, or above, Level 2. Of the BL2 learners, 23.1% are reported to have achieved an Other Level 2 and 13% a Level 3 qualification, especially Tech Levels (5.9%). A large proportion of those who start a BL2 programme (41%) only achieve a Level 1 qualification, while 5.4% do not achieve any qualification at all.

Labour market prospects of BL2 learners

Using data from HMRC records for the 2015 tax year, we analyse the labour market outcomes of BL2 learners and examine whether subject area and achievement of BL2 qualifications are associated with differences in labour market outcomes. We find that 59.6% of BL2 learners are doing some paid work in the 2015 tax year. Those who did some paid work earned on average £6,724. Our results suggest that BL2 learners who achieved their initial learning aim fare better in the labour market than those who did not. Differences in employment and earnings persist when controlling for demographic characteristics, past performance and behaviour at school, as well as college characteristics. Achieving the initial BL2 course is associated with a 4.6 percentage point increase in the probability of carrying out some paid work in the 2015 tax year, and with 16.7% higher earnings. Earnings differentials associated with achievement were significantly different across subject areas. Achieving a BL2 course in Health, Public Service and Care, Retail or Engineering is associated with substantially higher earnings compared to achieving a BL2 course in Preparation for Life and Work, the most popular subject area.

While we control for a number of individual and college characteristics, there may be other factors that drive both achievement and labour market outcomes. While further work would be needed to assess the causal effect of BL2 programmes, there is some indication that completing BL2 courses in some subject areas seem to improve labour market prospects.

Conclusions

Our results suggest that nearly 80% of BL2 learners had a positive transition to higher level VE, apprenticeship, or employment and a substantial share of them were still engaged in education in 2014. In contrast to these young people making successful transitions, 21% of young people had a trajectory of leaving BL2 to a persistent NEET episode. Another key finding is that achieving the low level qualification started by the age of 16 leads to better employment prospects and to higher earnings four years later, even when controlling for demographic characteristics, past performance and behaviour at school and college characteristics.

In our view, the evidence suggests policies should try encourage and support adolescents' engagement until they successfully gain their (low level) qualification. Evidence on interventions amongst adolescents show that the acquisition of basic skills in numeracy and literacy are greatly valued by employers. But targeting such cognitive skills in isolation is not sufficient for long term impacts on successful labour market performances. Non-cognitive skills such conscientiousness, self-discipline, perseverance, cooperation and willingness to be managed by more senior/adult employees are nearly equally essential ingredients to success on the labour market. The role of training mentors in this process can mimic parents involvement and appears most effective in firms-based environments away from formal schooling (Kautz et al., 2014).

1. Introduction

Little is known about the potential role of vocational education for low performing young people's progression in education and entry into the UK labour market. This has been recently underlined in a report by the House of Lords Select Committee on Social Mobility:

An increasing number of young people leave school and go on to A-Levels and university. Of the others, a small minority are at risk of dropping out of education, employment or training—the NEETs. Successive governments have focused on these two groups for a long time. But the majority of young people in the UK do not fall into either group. They do not go to university; they find jobs or they continue with some form of vocational education. Despite making up the majority of the emerging workforce, they have received much less attention.¹

The new classification presented in Hupkau et al. (2016) focused particularly on vocational and general qualifications at Levels 2 and 3 and provided new evidence on the pathways of young people from Key Stage 4 (KS4) to either the labour market, or to further and higher education programmes, such as Applied General and Technical Level qualifications (Tech levels). A-levels or other, vocational Level 3 qualifications can typically only be chosen by 16-year old (or older) students after having achieved a Level 2 qualification, such as five or more GCSEs marked A*-C (including English and mathematics).

In contrast, the education decision for those leaving secondary school with lower level qualifications is less clear. With the compulsory education participation age being raised to 18 recently, most young people with lower GCSE achievement are starting vocational programmes at or Below Level 2. Of those, learners Below Level 2 constitute a sizeable group of students (10% of recent cohorts leaving secondary school in England) for whom there is little systematic evidence about their vocational education participation and labour market outcomes.

This paper provides a detailed descriptive analysis of learners engaged in low level vocational education, known in the UK as 'Below Level 2' (BL2). We analyse the characteristics of learners in BL2 vocational qualifications, their learning activity post compulsory education, and labour market outcomes using a newly available linked administrative data at the individual level from the National Pupil Data (NPD), Individualised Learner Records (ILR) and employment data from Her Majesty's Revenue and Customs (HMRC) records. Our results suggest that almost 80% of BL2 learners had a positive transition to higher level VE, apprenticeship, or employment and a substantial share of them were still engaged in education in 2014. In contrast to these young people making successful transitions, 21% of young people had a trajectory of leaving BL2 to a persistent NEET episode. Another key finding is that achieving the low level qualification started by the age of 16 leads to better employment prospects and to higher earnings four years later, even when controlling for demographic

¹ House of Lords Select Committee on Social Mobility (2016). *Overlooked and left behind: improving the transition from school to work for the majority of young people*. London: The Stationery Office Limited, available online <http://www.publications.parliament.uk/pa/ld201516/ldselect/ldsocmob/120/120.pdf>

characteristics, past performance and behaviour at school and college characteristics. This suggests policies should try encourage and support adolescents' engagement until they successfully gain their (low level) qualification.

The remainder of this paper is structured as follows: in the next section, we discuss the existing literature on low level vocational courses and similar interventions. Then we present the data used for the analysis. Section 4 presents evidence on the characteristics of learners in BL2 vocational qualifications, their learning activity post compulsory education, and labour market outcomes. The last section concludes.

2. Background and existing Literature

The UK has the third lowest rate of education participation for 15-19 year olds in Europe: overall 79% of teenagers aged 15 to 19 years old were still in full-time education in 2012. Indeed, only Malta and Cyprus present lower rates (Hadjivassiliou et al., 2015). By contrast, the UK has one of the highest tertiary education rates (see Europe 2020, Target Tertiary Education attainment²), suggesting a profound imbalance in education participation in favour of the academic route.

However, as in all other European countries, participation of young people in post-compulsory education has significantly increased in the UK (Hadjivassiliou et al., 2015) in recent times, and the increase is observed for both high and low achievers. For example, the proportion of 16 and 17-year olds in full-time education after the end of secondary school has increased from 57% in 1992 to 74% in 2008 (Barham et al., 2009). At the end of 2013, 85.9% of 16-year olds and 70% of 16-18 year olds were participating in full-time education, the highest level registered since records began (Department for Education, 2014).

Previous research evidence on the benefits of post-16 education suggests that participation in post-compulsory education is beneficial as it leads to the acquisition of further educational qualifications beyond GCSE level (Howieson and Iannelli, 2008). Obtaining higher qualifications is usually identified as a positive factor because it increases the chances of a successful transition from school to the labour market, good occupational outcomes and returns in earnings (See Kirchner-Sala et al., 2015, for a review). However, empirical evidence also suggests that the returns differ widely by the levels of qualifications. Obtaining a Level 2 or Level 3 is strongly associated with progression in education (Lenton and McIntosh, 2008). The evidence on low level qualifications is mixed. While there is some indication that Below Level 2 qualifications increase the attainment of Level 2 qualifications (Wiseman et al., 2013) and are associated with improved employment and earnings (London Economics, 2011) some studies found no evidence on any effect on employment or earnings (McIntosh, 2004).

Indeed, further qualitative research evidence suggests that qualifications do not have a particularly important role in the recruitment of low-skilled employees, with employers

² http://ec.europa.eu/europe2020/pdf/themes/28_tertiary_education.pdf

preferring to recruit based on other evidence of skills, characteristics, and attributes (Newton et al., 2005; Lloyd and Mayhew cited in McQuaid et al., 2012). A body of studies have examined the effects of interventions during adolescence that combine cognitive learning with wider aims such as punctuality, teamwork and presentation skills. Those latter skills are often mentioned by employers as key skills lacking in young school leavers. Recent studies have found that some of those programmes have strong positive impacts on successful transitions from school to the labour market (Francesconi and Heckman, 2016). Those programmes appear particularly successful when they focus on improving the efficient deployment of existing skills. In particular, the teaching of self-confidence, team working and discipline appear to generate positive outcomes on adolescent transitions to the labour market (Bettinger et al., 2012; Carrell and Sacerdote, 2013; Alan and Ertac, 2015; Cook et al., 2014). A recent OECD review highlighted interventions at the adolescent stage that appear to be most effective (Kautz et al., 2014) and recent evidence reviewed in Heckman and Kautz (2014) shows that apprenticeships combining work-based and classroom learning are the most effective at generating promising transitions from school to the labour markets.

Overall, there are few studies focused on the returns to low level vocational education (BL2). This suggests the need for more evidence on this question, especially for school leavers. This paper aims to fill this gap, by analysing the characteristics, the labour market trajectories and the early performance in the labour market of this group of learners.

3. Data

The data used in this paper are a combination of four administrative databases, providing an unusually comprehensive and rich source of information on young people at the time of leaving compulsory education. This dataset then allows for the observation of the cohort born between September 1994 and August 1995 through all the education stages, from entering compulsory school in 1999, to completing primary school in 2006, and reaching the school leaving age of 16 in the academic year ending in summer 2011.

The schooling achievements data were then linked to the subsequent education participation data for the academic years 2011/2012 and 2013/2014, to the tax records from Her Majesty's Revenue and Customs (HMRC), and to the data on participation in vocational education (Individualised Learner Records, ILR) and administrative data maintained by local authorities (National Client Caseload Information System, NCCIS). The data allows us to follow in detail, month after month, the cohort between the ages of 16 and 19.

More specifically, the data on schooling history comes from the National Pupil Database (NPD), which contains key demographic characteristics (ethnicity, gender), basic family background information (composite index of deprivation in the local area, rural/urban location) and performance at national tests at the age of 7, 11, 14, 16 and 18. The combination of this schooling data with the ILR, provides complete information on all those students that left the academic track to enter Further Education (FE) colleges. In addition, the data are then merged

with the data from NCCIS, a record system which holds data on their post-16 education activity or the NEET status for all 16-19 year olds in England. Lastly, employment information was included from the Longitudinal Education Outcomes (LEO) dataset, which covers all employment subject to National Insurance Contributions, obtained from HMRC tax records.

Overall, our data include GCSE performance, a subject-specific recognised qualification, which is usually taken in 8-10 topics, generally including English and mathematics. Amongst all students taking GCSEs in May-June 2011, 434,850 (68.3%) had at least one record in the ILR between 2011/2012 and 2013/2014, 412,800 (64.8%) are then found in Key Stage 5 (KS5)³ records. Only 32,650 (5.1%) are neither in KS5 records nor in the ILR. These young people did not engage in any learning activities in England, but may have moved to Northern Ireland, Wales, Scotland or overseas.

For the purposes of this paper, we use the data to identify the learning aim at the highest level, and/or any other activity in every month after the end of secondary education. A status variable was then defined, reporting the highest level of general learning and/or vocational qualifications, following the classification derived by Hupkau et al. (2016), or the individual employment status (if no education participation is observed in the calendar month).

4. Results

4.1 Defining and describing BL2 learners compared to other groups

In this section we compare our main group of interest (BL2) to the rest of the cohort leaving compulsory education in summer 2011.

Table 1 describes the initial learning engagement situation of the full cohort of pupils who completed compulsory education in summer 2011: 58.5% students are engaged in either the academic track leading to university education (A-Levels), or higher level technical education (Applied Generals, Tech Levels or other vocational programmes aiming for Level 3 qualifications).

Only 2.8% of those leaving secondary school immediately start an apprenticeship, the majority of which is at Level 2 (2.2%). About 12% are engaged in other Level 2 programmes, including Tech Certificates, GCSEs, Key Skills and other vocational Level 2 qualifications. Lastly, 10.3% (65,768) of the whole cohort enrol in low level vocational education (so-called: ‘Below Level 2’, BL2), and a vast majority of them (94%) at Level 1. This is the group of interest for this paper.

Panel A of Table 2 reports some demographic characteristics of the BL2 learners as well as the other groups: two thirds of the BL2 learners are males. British White people are over-

³ Key Stage refers to the last two years of education of the National Curriculum for students aged 16-18 in England, Wales and Northern Ireland.

represented in this group in respect to other ethnicities, and people are more likely to be born in the summer period, and thus be relatively young in their cohort.

In panel B (Table 2), we show the previous achievement at KS3 and KS4 for our main group of interest (BL2), in comparison to other groups. People starting BL2 qualifications come from the bottom of the school performance distribution: they have extremely poor GCSE results (96.2% did not achieve five A*-C GCSEs, including maths and English) and over half of them performed below the expected level in English and maths when they were 14 years old. Moreover, 68.5% of the BL2 group did not even achieve a single GCSE A*-C, a proportion that is higher than for any other group, including people who leave education to work (48.6%) and those who become NEETs (60.7%). To put those figures in perspective, 88.4% of adolescents starting A-Levels achieved five A*-C GCSEs, including English and maths.

Finally, a large proportion (39.0%) of BL2 learners⁴ report themselves as having disabilities, learning difficulties or other health problems (Figure 1). These students are mainly enrolled in Agriculture and Preparation for Life and Work. In contrast, learning difficulties/disabilities and health problems are less common among students in Construction.

4.2 Describing below level 2 learning

The great majority of BL2 learners undertake learning aims in English and maths to work towards a Level 2 in each subject. This learning is often embedded in their main vocational subject (identified in the data as the learning ‘aim’ with the highest number of Guided Learning Hours (GLH)⁵). As shown in Table 3, the average BL2 course lasts 12 months with a mean of 244 guided learning hours.

The most frequent subject of the main vocational learning aims for BL2 learners is Preparation for Life and Work (29.3% of all learners, see Figure 2), which combines vocational subjects at BL2 skill levels, as well as general, personal and social skills⁶. Indeed, it is likely that the individual characteristics of the learner would result in a specific choice of course combination, for example selecting more general skills in order to progress to a vocational field (see ‘Purpose Statement’, below) or more vocational courses if the student is more ready to engage in technical skills for particular occupations. Amongst the subject areas with a clear vocational focus, the most popular choices are Construction (23.7%), Engineering (15.5%), Retail (12.2%), Health, Public Services and Care (8.4%), Agriculture (2.6%). And Leisure/Tourism (2.5%). The description of the purpose statement related to the learning aim shows that a significant proportion of BL2 learning activities (16.2%) have the purpose of ‘personal growth and engagement in learning’ (Figure 3). Further reasons for engaging in the

⁴ Note that the analysis here is restricted to students in subject areas with more than 100 observations.

⁵ As can be seen in Table 3, GLH for the main vocational aims are reported for about 61,200 BL2 learners, out of a cohort of 65,800. We could not identify such aim for about 4,500 young people, primarily because their programme of study did not have a specified number of GLHs, as, for instance, is the case for some re-engagement programmes.

⁶ Main vocational aims at BL2 level are structured by individual learning plans and allow for many choices by learners and options. For example see http://qualifications.pearson.com/content/dam/pdf/BTEC-Entry-Level-and-Level-1/Vocational-Studies/2010/Specification/9781446907702_Entry_E3_VoStuUni_Issue_2.pdf

Individual aims additionally vary by the accrediting body chosen by the college, for example <http://filestore.aqa.org.uk/subjects/AQA-4800-W-SP-13.PDF>

specific aims are to acquire a licence to practice (4.8%), prepare for employment (9.5%) or gain specific knowledge and skills of a subject area (55.9% of all BL2 learners).

4.3 Progression after initial BL2 course

This section describes the education and labour market participation of the BL2 learners in September 2012, September 2013 and August 2014 (Table 4). We find significant progression in education by the BL2 learners. About half of the BL2 learners made a transition to Level 2 learning after one year: 27.1% to Other Level 2 vocational programmes, 10.4% to Tech Certificates (Level 2) and 5.9% to Intermediate Apprenticeships. An additional 3.2% are in Level 3 programmes. While 7.2% can no longer be observed in any of the records, 11.6% are reported as NEET, 7.0% employed outside education and 26.1% remain at BL2 level. Two years after the start of BL2, over half of the cohort is still observed in learning, 16.9% are engaged in Level 3 programmes, 22.0% in Level 2 programmes. The employment rate outside education for the initial participants has increased to 20.6% and another 18.9% are recorded as NEET. After three years, 12.4% of the young people have progressed to (mainly) Level 3 programmes - 5.0% in Tech Levels and 2.5% in Advanced Apprenticeships. Employment outside of education increased to 40.3% and the NEET rate remains just above 20%. As shown in Figure 8 in the Online Appendix, there are no substantial differences between males and females.

In order to analyse whether subject changes determine whether people remain in BL2 programmes, we further analyse whether the subject of the main vocational learning aim changes between September 2011 and 2012. Figure 4 shows this analysis for those starting the five most popular subject areas in September 2011 (Preparation for Life and Work, Construction, Engineering, Retail and Health/Public Services and Care). As is suggested in Figure 4, between 20 and 30% of BL2 learners left education before the start of the subsequent academic year and can no longer be observed. Of the remaining group, most students continue in their subject area, e.g. 56.7% who started in Retail are still studying for vocational qualifications in this sector. Similarly, most people starting BL2 qualifications in Construction and Engineering remain in their subject area. The exception to this is Preparation for Life and Work, of which only 30.7% of the initial participants continue with the subject, while the majority make a transition to a vocational subject. Some of the BL2 learners in the other subject areas also change to Preparation for Life and Work: 5%-7% from Construction, Engineering and Retail. The figure is higher for people in Health/Public Services and Care.

4.4 Typology of learning trajectory between the ages of 16 and 19

In this section, we derive a typology of different trajectories followed by the BL2 learners, based on the monthly activity status between the ages of 16 and 19. Using sequential analysis (Brzinsky-Fay et al., 2006), we compute a distance measure between the individual trajectories and then run a cluster analysis to identify types of trajectories on a 20% random sample of BL2 learners⁷ (For more detail on the method, see Appendix).

⁷ Because the algorithm to conduct the sequence and cluster analysis is computationally very demanding, we could not run the analysis on the full cohort of BL2 learners but had to select a 20% random sample. Results obtained with different subsamples are consistent with the results presented in this section.

Relying on this data driven approach, four groups of BL2 learners with four distinct trajectories were identified. Figure 5 reports individual trajectories for these four groups of BL2 learners. The trajectories are the following:

i) *NEET status*: about one fifth (21.2%) of BL2 learners make a rapid transition from BL2 to a NEET status. The great majority of these are reported to drop out within the first year after leaving secondary school and do not re-engage in education or move into sustained employment. By contrast, the majority of those making positive transitions, i.e. to education and employment, remained in education at 17.

ii) *Sustained employment*: another fifth (21.1%) of BL2 learners make a transition to sustained employment. Most of them move straight into employment after their initial BL2 course, but around a quarter of them engage in BL2 or a Level 2 vocational course for another year before joining the labour market.

iii) *College-based vocational education*: close to half (44.8%) of the BL2 learners remain and progress in college-based vocational education. While some remain in BL2 courses beyond the first year, the majority of them move to Level 2 (including Tech certificates) and even Level 3 in the second and third year, which can be seen as a positive outcome.

iv) *Apprenticeships*: 12.9% of the BL2 learners progress to an apprenticeship. These young people start apprenticeships directly from BL2 programmes or after a subsequent higher Level VE.

In summary, nearly 80% of all BL2 learners made successful transitions, leading into continued employment, higher level VE or apprenticeships. In the Appendix Figure A1, this four group typology was tested to check if it varied across gender: the figures are very similar for males and females, with no significant differences.

An analysis was then conducted on whether there is an association between the BL2 subject area and achievement, and the type of post-BL2 transition followed by the learners. This was done using a multinomial logit regression, regressing the type of trajectory (as the dependent variable) on BL2 subject area and achievement status, as well as socio-demographic characteristics (gender, ethnicity, Quintile of Index of Multiple Deprivation), performance in secondary school (number of GCSEs, A*-C, GCSE in maths and English, whether the learner was excluded from school) and college characteristics (number of learners, average achievement rate).

Table 5 shows the marginal effects from the estimations of the multinomial logit model: achieving the main BL2 aim⁸ is associated with progression in the vocational education system. Conditional on the characteristics included in the model, those who achieved their main BL2 course are 27.7 percentage points (p.p.) more likely to progress to higher level vocational education courses. Achieving the main BL2 aim is associated with a reduction in the probability of becoming NEET (-14.9 p.p.), of moving straight into employment (-9.0 p.p.) or into an apprenticeship (-3.7 p.p.). Results from an additional model that interacts achievement with the subject of the main aim are reported in Table A1 in Appendix, and

⁸ 74.0% of BL2 learners achieved their main aim.

indicate that the association between achievement and progression to higher level vocational education is stronger for Construction, Retail and Engineering, compared to Preparation for Life and Work. Compared to the BL2 courses in Preparation for Life and Work (which is the omitted category), those enrolled in courses in Construction are more likely to follow an apprenticeship and employment trajectory, instead of becoming NEET or undertaking further vocational education courses.

A range of individual and college characteristics were included, since they are likely to be correlated with both achievement and the type of transitions experienced by young people. Progression following being enrolled in a BL2 learning course is related to individual characteristics. Indeed, women are less likely to enter employment, and are more likely to become NEET than men. Those from a more privileged background are more likely to move into an apprenticeship or employment than become NEET. These estimates may not reflect a causal relationship of achievement of the main BL2 course: there may be other factors that drive both achievement and the type of transitions experienced by young people. For instance, more motivated individuals may perform better and therefore be more likely to achieve the BL2 course, and then continue into higher level courses or apprenticeship. Further work is needed to analyse whether participating in BL2 courses has a causal effect on young people's prospects.

4.5 Educational achievement at 19

While the previous section focused on the monthly activities undertaken by BL2 learners, this section examines qualification attainment three years after leaving secondary school.

Table 6 shows the education achievements three years after leaving secondary school for BL2 learners. The education achievement descriptives for BL2 learners, as well as other groups defined by the status reported in the September following GCSEs, are reported in Table A2 in the Appendix. Over half of the BL2 learners achieved a qualification at, or above, Level 2. Of the BL2 learners 23.1% are reported to have achieved an Other Level 2 and 13% a Level 3 qualification, mainly Tech Levels (5.9%). A large proportion of those who start a BL2 programme (41%) achieve only a Level 1 qualification, while 5.4% do not achieve any qualification at all.

Table 7 shows the highest qualification achieved at the age of 19, grouped by the trajectory typology identified in the previous section⁹. Around 60% of BL2 learners who progressed into an apprenticeship had achieved the apprenticeship outcome by August 2014. Considering that some apprenticeships programmes can take up to 24 months to complete, some learners might still have been engaged in the programme in August 2014, and the number might increase when analysing later data. However, other learners may have dropped out: the overall achievement rate of apprenticeship for 16-18 year olds was 72% in the academic year 2013/2014¹⁰. Nearly 80% of those who progressed to college-based VE obtained a Level 2 qualification or higher. Just under one third (30.7%) of those who followed an employment

⁹ Because the sequential and clustering analysis was conducted using a 20% random sample of all BL2 learners, the total figures in the last column of 7 may differ from the data presented in **Error! Reference source not found.6**.

¹⁰ <https://www.gov.uk/government/statistical-data-sets/sfa-national-achievement-rates-tables-2014-to-2015>

trajectory achieved a qualification at or above Level 2, compared to 8.4% of those who became NEET.

This table can also be seen as a way of assessing how well the typology of trajectories matches the actual qualification attainment three years after leaving school. Looking at row percentages, we calculate that 97.6% of those who obtained a Level 3 or above qualification were classified as having progressed to the college-based VE trajectory, while 90.3% of those who achieved an apprenticeship were classified as having progressed to an apprenticeship trajectory from initially BL2. Over 90% of those who follow the NEET trajectory did not achieve any qualification above Level 1, suggesting that our typology correctly identifies the group most at risk. This suggests that our data-driven classification matches the achievement of qualification at the age of 19, and could then be used in other contexts where achievements data are not available.

4.6 Labour market prospects of BL2 learners

In this section, we analyse the labour market outcomes of BL2 learners, and focus on the potential relationship between the subject area and achievement of BL2 qualifications, and the differences in labour market outcomes.

Table 8 reports the labour market outcomes in the 2015 tax year for the BL2 learners. We focus on whether BL2 learners have been doing some paid work in 2015¹¹, total earnings and earnings of those who have been doing some paid work. Overall, 59.6% of BL2 learners were doing some paid work in the 2015 tax year. The average earnings for the entire cohort amounts to £4,011, while the average earnings conditional on doing some paid work is £6,724. BL2 learners who achieved their main course fare better in the labour market than those who did not: they are more likely to be employed (61.6%), compared with 54.0% of those who did not achieve their main aim. They have higher total earnings (£4,243 vs £3,349) and earn more, conditional on being employed. There is also substantial variation across subjects: learners who study Engineering and manufacturing, or Construction, have better labour market prospects than those engaged in courses in Preparation for Life and Work.

In order to disentangle the effect of individual and college characteristics, some regression models were estimated to examine the relationship between the labour market outcomes and BL2 course characteristics and achievement, also including a range of controls, similar to those included in the multinomial logit discussed in the previous section.

Table 9 presents the estimates of these regressions, using labour market outcomes in the tax year 2015-2016, and controlling for socio-demographic characteristics, performance in secondary school and college characteristics. Achieving a BL2 course is associated with an increase in earnings in the 2015 tax year of £510.4. Achievement is not only related to a higher probability of carrying out some paid work (+4.6 p.p.) in the 2015 tax year but also with higher earnings for those who are employed (+16.7%). Studying BL2 courses in Preparation for Life and Work is associated with less favourable labour market prospects compared to the other main subjects, controlling for a range of individual and college characteristics. On average, studying Engineering and manufacturing is related to £1,406 higher annual earnings compared

¹¹ BL2 learners are considered to have been doing some paid work in 2015 if the tax records report a positive value of earnings in 2015

to studying Preparation for Life and Work. The premium for studying Retail amounts to £833.9 a year, and £1,146 for Construction. However, studying BL2 courses in Preparation for Life and Work is associated with better labour market outcomes than other smaller, less popular subjects such Agriculture and Business and languages, which were aggregated together into a residual category.

Figure 6 presents estimates of the effect of achieving a BL2 course in different subjects, showing the interaction between achievement and each subject. Therefore, the estimates can be interpreted as the effect of completion of each course compared to non-completers in the same subjects. We find significant differences in the returns to achievement across subject. Achievement is related to large returns for courses in Retail, Health, Public services, Engineering or Construction. However, achievement is not associated with any labour market returns for Preparation for Life and Work. This does not imply that engaging in that course has no impact on wages, as the result is compatible with a story where the course leads to successful transitions into paid employment or higher level learning, before formally obtaining the qualification.

As mentioned in the previous section, we cannot claim that these conditional associations can be interpreted as causal effects. While we control for a number of individual and college characteristics, there may be other factors that drive both achievement and labour market outcomes. However, while further work is needed to assess the causal effect of BL2 programmes, there is some indication that completing BL2 courses in some subject areas could improve labour market prospects.

5. Conclusion

While the progression to A-levels and higher education and the related labour market returns have been comparatively well studied, not much is known about the education decision making process and school-to-work transitions of those leaving secondary school with lower level qualifications. Thus, the objective of this paper was to provide a descriptive analysis of one group of such adolescents who start vocational education at low levels. Using newly available linked administrative data at the individual level from the National Pupil Data (NPD), Individualised Learner Records (ILR) and employment data from Her Majesty's Revenue and Customs (HMRC) records allows us to follow this particular group for three years.

Our results suggest that nearly 80% of BL2 learners had a positive transition to higher level VE, apprenticeship, or employment and a substantial share of them were still engaged in education in 2014. Over half the initial learners achieved qualifications at or above Level 2 by the end of 2014. Four years after starting a low level programme, the employment rate of the BL2 learners is around 60%, showing a successful labour market transition for many individuals. In contrast to these young people making successful transitions, a fifth cohort enter a persistent NEET trajectory.

Another key finding is that achieving the initial low level qualification can lead to a better employment situation four years later. Moreover, achievers have higher total earnings (£4,243 vs £3,349) and earn more, conditional on being employed. There is also substantial variation across the subject areas: learners in courses such as Engineering and manufacturing, Construction and, to a lesser extent Retail, have better labour market prospects than those engaged in Preparation for Life and Work. Achievement consistently appears to be one of the key contributors to better performance and transitions into the labour market for this group, suggesting that government policies should try to encourage and support engagement until the achievement of a qualification. Evidence on interventions amongst adolescents show that the acquisition of basic skills in numeracy and literacy are greatly valued by employers. But targeting such cognitive skills in isolation is not sufficient for long term impacts on successful labour market performances. Non-cognitive skills such conscientiousness, self-discipline, perseverance, cooperation and willingness to be managed by more senior/adult employees are nearly equally essential ingredients to success on the labour market. The role of training mentors in this process can mimic parents involvement and appears most effective in firms-based environments away from formal schooling (Kautz et al., 2014).

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Tables and Figures

Table 1: Initial destination after GCSEs in September after KS4

	Linked NPD-ILR- NCCIS data	Linked NPD-ILR-NCCIS replacing non-education by employment if found in HMRC data	
	%	%	1,000s*
HE/Above L3*	0.0	0.0	0.1
Mainly A Levels	45.3	45.7	288.4
Mainly App Gen	5.5	5.6	35.2
Mainly Tech Levels	3.7	3.7	23.5
Adv. Apprenticeship	0.6	0.6	3.7
Mainly Other L3	2.8	2.9	18.0
Tech Certificate	2.2	2.2	14.1
Apprenticeship	2.2	2.2	14.1
Other Vocational L2	8.6	8.7	54.6
Key/Functional Skills L2	0.4	0.4	2.3
GCSEs	0.4	0.4	2.6
Below L2	10.3	10.4	65.8
Employment	1.3	3.5	22.0
NEET/Other NCCIS	4.7	4.2	26.4
Included in NCCIS with 'Status Not Observed'	11.0	9.5	60.0
Missing in any post-16 data set	1.0	1.0	6.3
Total	100.0	100.0	637.0

*Numbers have been rounded to nearest 100

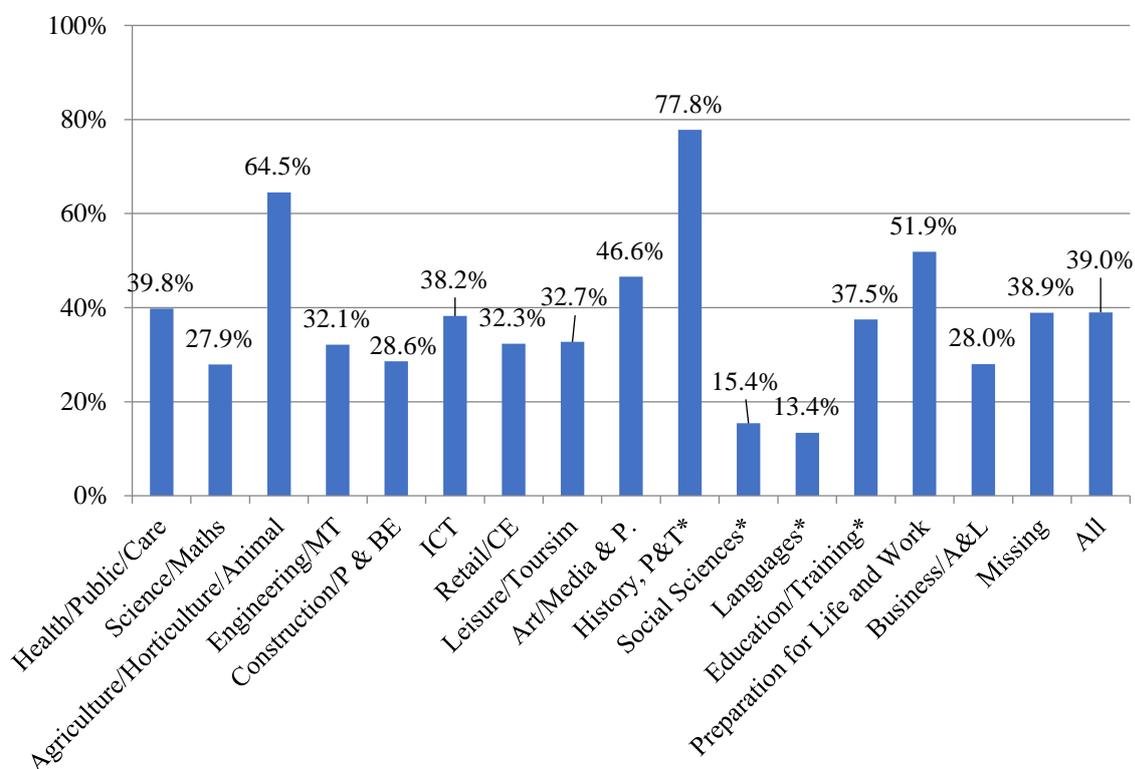
Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Table 2: Characteristics of the cohort of KS4 leavers 2010/11

		Above L3	Mainly A Levels	Mainly App Gen	Mainly Tech Levels	Adv Appr.	Mainly Other L3	Tech Certificate	Appr.	Other Voc. L2	Key/ Functional Skills L2	GCSEs	Below L2	Employment	NEET/ Other NCCIS	NCCIS "Not Observed"	All
A. Demographics characteristics																	
Gender	F	58.1	54.1	49.9	45.7	8.7	60.6	76.6	43.4	43.3	28.3	45.6	32.8	30.1	43.5	45.7	48.2
	M	41.9	45.9	50.1	54.3	91.3	39.4	23.4	56.6	56.7	71.7	54.4	67.2	69.9	56.5	54.3	50.8
Ethnicity	White	72.0	72.3	78.7	84.0	86.1	84.9	89.7	91.3	76.3	79.8	56.1	78.8	90.1	75.6	58.1	73.7
	Unobserved	9.7	8.5	3.3	3.9	3.2	4.8	3.9	3.1	5.5	6.6	10.4	7.4	5.4	12.8	25.9	10.0
Month of birth	Average	6.8	6.6	6.5	6.4	6.7	6.5	6.4	6.6	6.5	6.5	6.4	6.4	6.7	6.6	6.5	6.5
B. Previous achievements																	
Number of Full GCSE qualifications at grades A*-C	0	12.9	0.2	5.2	4.0	7.4	4.2	31.0	26.5	34.5	34.4	32.9	68.5	48.6	60.7	27.4	18.8
	1	8.6	0.7	7.5	5.8	7.3	7.0	18.7	14.8	23.3	20.0	21.6	15.0	14.1	12.4	10.5	7.5
	2	7.5	1.4	11.1	9.4	8.4	11.1	15.7	12.2	16.5	12.2	18.1	6.4	9.3	6.9	8.1	6.1
	3	3.2	2.4	13.6	12.5	8.8	13.9	11.0	11.0	10.3	10.0	13.1	3.7	7.0	5.0	6.7	5.6
	4	5.4	3.7	14.5	13.7	9.7	14.1	7.8	8.6	5.9	7.1	7.9	2.2	5.6	3.4	5.7	5.5
	5+	62.4	91.6	48	54.4	58.6	49.6	15.7	26.9	9.5	16.3	6.4	4.4	15.3	11.6	41.6	55.4
Achieved 5 A*-C including English and maths	No	37.6	11.6	57.2	51.9	44.0	54.7	87.0	75.1	92.1	86.3	96.0	96.2	86.4	89.5	60.9	46.3
	Yes	62.4	88.4	42.8	48.1	56.0	45.3	13.0	24.9	7.9	13.7	4.0	3.8	13.6	10.5	39.1	52.7
	Unobserved	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
KS3 english	Below expected	18.3	2.7	13.6	12.4	13.2	11.5	29.4	27.1	37.2	34.2	31.1	59.1	40.5	42.7	23.8	18.9
	Unobserved	9.7	11.5	5.6	6.3	5.3	7.1	4.8	4.1	7.5	7.5	14.1	10.6	6.7	14.4	31.4	12.9
KS3 mathematics	Below expected	19.4	2.3	12.4	10.0	6.2	11.5	34.4	23.1	34.9	23.3	27.3	54.0	33.0	39.4	22.4	17.3
	Unobserved	10.8	11.6	5.7	6.5	5.0	7.3	4.8	4.2	7.6	7.7	14.0	10.4	6.7	14.0	31.4	12.9
KS2 english	Below expected	8.6	2.7	12.0	11.5	10.3	11.4	25.2	21.8	28.2	26.7	22.3	34.6	26.9	27.9	15.6	13.4
	Unobserved	11.8	8.2	6.7	6.8	3.9	6.1	8.1	5.7	13.6	10.7	19.7	29.9	12.0	18.3	27.5	13.9
KS2 mathematics	Below expected	19.4	5.3	17.9	16.3	8.2	18.3	37.8	25.7	34.1	25.6	29.1	35.4	30.2	31.6	18.7	16.8
	Unobserved	10.8	8.2	6.7	6.7	3.5	6.1	9.0	5.0	13.9	9.9	19.6	28.6	9.9	17.6	27.5	13.7
Total in '000s		0.1	288.4	35.2	23.5	3.7	18.0	14.1	14.1	54.6	2.3	2.6	65.8	8.5	29.7	70.2	637.0

Source: NPD, ILR, NCCIS, Italic indicate group size under 100

Figure 1: Learning difficulties and/or disabilities and/or health problems of all learners Below Level 2 by sector of main vocational aim



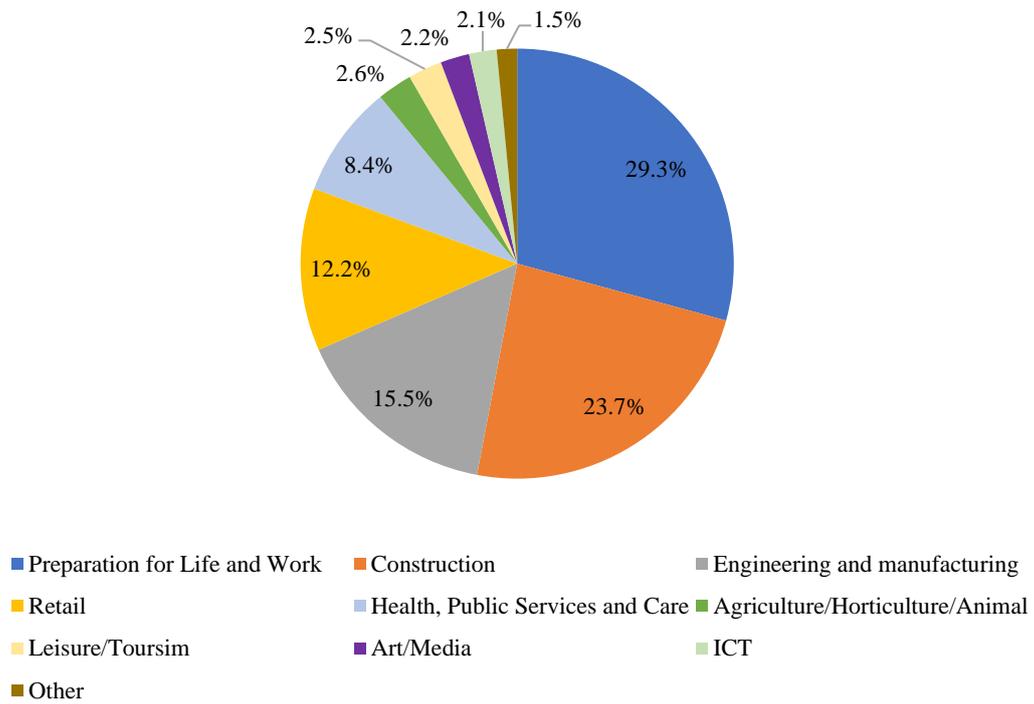
Source: ILR data for KS4 leavers 2010/11

Table 3: BL2 Learning hours and training duration (main aim)

	Observed for learners (in 000s)	Mean value	Standard Deviation	Min.	Max.
Credit value of main vocational aim	57.0	29.12	14.30	0.00	64.00
Total GLH (min) in September 2011	65.3	347.65	190.37	0.00	1,354.00
Minimum GLH of main vocational aim (if known)	61.2	243.78	126.82	6.00	600.00
Duration of initial education participation (in months)	65.8	12.10	7.66	1	36

Source: ILR data for KS4 leavers 2010/11

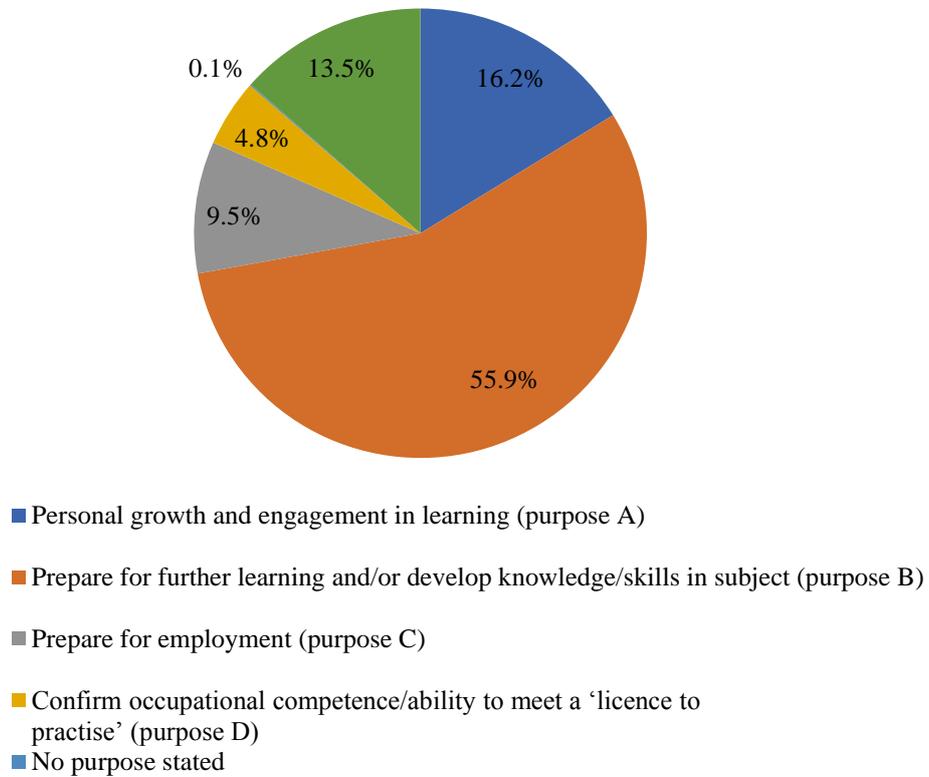
Figure 2: Subject area of main vocational learning aim



Source: ILR data for KS4 leavers 2010/11

Other subject areas include Science, Business and Administration and Languages

Figure 3: Purpose statement



Source: ILR data for KS4 leavers 2010/11

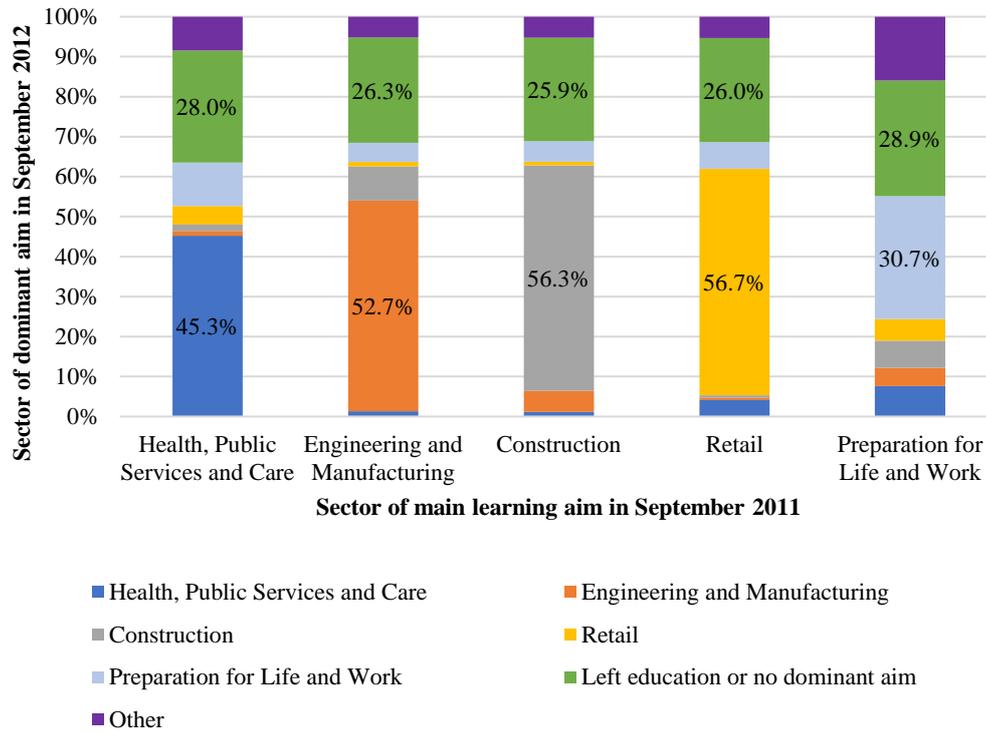
Table 4 Education and labour market participation

	Sep-2012	Sep-2013	Aug-2014
HE/Above L3	0.0	0.3	0.7
Mainly A Levels	0.3	0.2	0.2
Mainly App Gen	0.9	2.7	1.9
Mainly Tech Levels	0.7	8.1	5.0
Adv Apprenticeship	0.5	1.8	2.5
Mainly Other L3	0.8	3.7	2.1
Tech Certificate	10.4	5.2	0.1
Apprenticeship	5.9	7.6	6.1
Other Vocational L2	27.1	8.0	0.4
Key/Functional Skills	1.4	1.2	0.1
GCSEs	0.3	0.3	0.0
Below L2	26.1	12.6	1.0
Employment	7.0	20.6	40.3
NEET/Other NCCIS	11.6	18.9	20.7
Not Observed	7.2	8.7	19.0
Total	100.0	100.0	100.0

Note that education participation can only be observed until August 2014

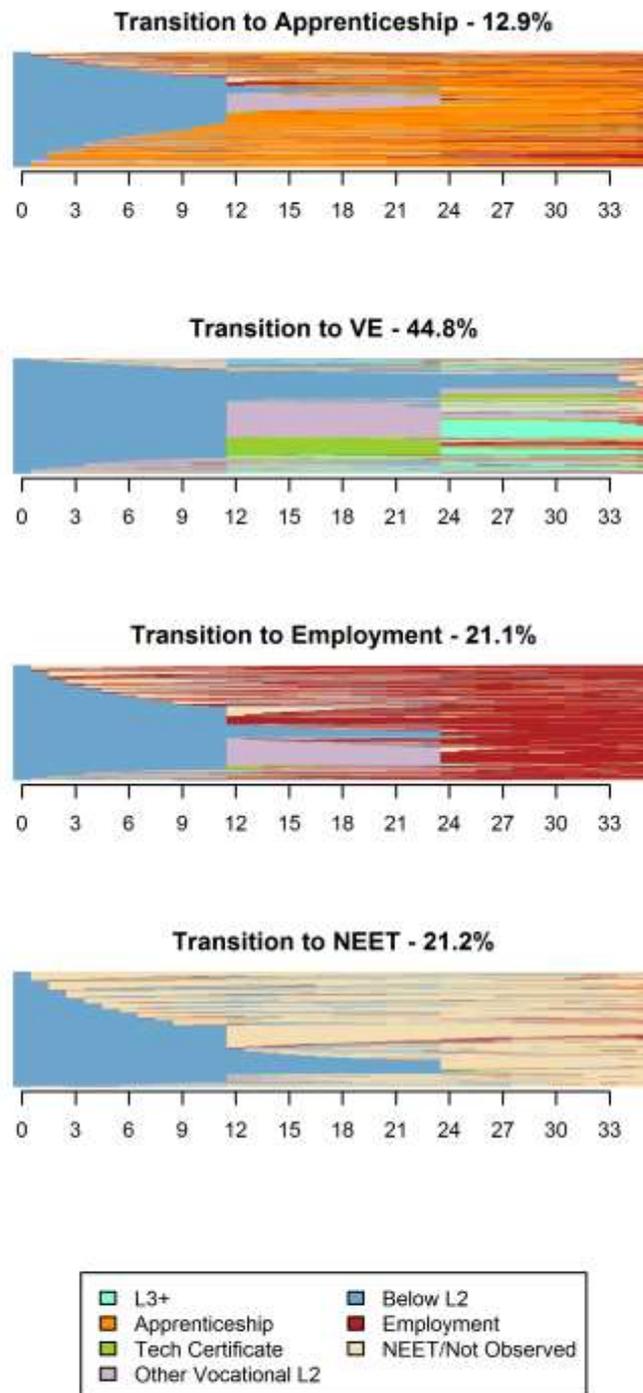
Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Figure 4: Subjects of main vocational aims of BL2 learners, September 2011 and 2012



Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Figure 5: Clustered education and employment sequences of 'Below Level 2' learners



Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Table 5: Marginal effects on probability to follow particular transitions

		Apprenticeship	Other VE	Employment	NEET	
BL2 aim characteristics	Main aim achieved	-0.0373*** (0.00672)	0.277*** (0.00986)	-0.0902*** (0.00778)	-0.149*** (0.00658)	
	<i>Initial subjects enrolled in:</i>					
	Health public services and care	0.0146 (0.0134)	-0.0392** (0.0179)	0.0580*** (0.0155)	-0.0334** (0.0136)	
	Engineering and manufacturing	0.0126 (0.0107)	0.00516 (0.0149)	0.0126 (0.0129)	-0.0304** (0.0121)	
	Construction	0.0419*** (0.00936)	-0.0847*** (0.0135)	0.0706*** (0.0111)	-0.0278*** (0.0107)	
	Retail	-0.0173 (0.0120)	0.00386 (0.0160)	0.0459*** (0.0140)	-0.0325*** (0.0124)	
	Other	-0.0196* (0.0117)	0.0163 (0.0148)	-0.00157 (0.0134)	0.00487 (0.0106)	
	Individual characteristics	Female	-0.00785 (0.00884)	0.00191 (0.0117)	-0.0454*** (0.0104)	0.0514*** (0.00866)
		White	0.0620*** (0.0106)	-0.166*** (0.0125)	0.0941*** (0.0124)	0.00979 (0.00972)
		Disability or learning difficulty	-0.0533*** (0.00729)	0.0841*** (0.00942)	-0.0419*** (0.00815)	0.0111 (0.00721)
IMD Quintile 2		0.00582 (0.00830)	0.00131 (0.0114)	0.0311*** (0.00978)	-0.0382*** (0.00857)	
IMD Quintile 3		0.0137 (0.00908)	0.00853 (0.0129)	0.0416*** (0.0108)	-0.0638*** (0.0103)	
IMD Quintile 4		0.0177* (0.0100)	0.00306 (0.0146)	0.0494*** (0.0120)	-0.0702*** (0.0123)	
IMD Quintile 5		0.0408*** (0.0106)	-0.00696 (0.0165)	0.0502*** (0.0134)	-0.0841*** (0.0144)	
Number of GCSEs achieved		0.0107*** (0.00148)	0.00592*** (0.00210)	0.00690*** (0.00177)	-0.0235*** (0.00166)	
A*-C GCSE in English		0.0613*** (0.00841)	0.0251* (0.0150)	-0.0157 (0.0124)	-0.0706*** (0.0151)	
A*-C GCSE in Maths		0.0437*** (0.00840)	0.0776*** (0.0148)	-0.0184 (0.0121)	-0.103*** (0.0157)	
Excluded from School		-0.00406 (0.00914)	-0.122*** (0.0131)	0.0620*** (0.00988)	0.0642*** (0.00895)	
Pseudo-R2		0.0927				
Observations		11,820				

Note: Marginal effects based on a multinomial logit. The omitted reference for subjects enrolment is Preparation for Life and Work. The model also controls for college characteristics (Number of learners and average achievement rate).

Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Table 6 Achievement by month 36 after GCSEs

	Frequency	Percent
Above level 3	9	0.0
Mainly A-Levels	204	0.3
Mainly Applied Generals	1,345	2.0
Mainly Tech Levels	3,859	5.9
Advanced Apprenticeship	817	1.2
Mainly KS/NVQ Level 3	630	1.0
Mainly other Level 3	1,727	2.6
Tech certificate	5,472	8.3
Intermediate Apprenticeship	4,878	7.4
Other vocational at level 2	15,210	23.1
Key/Functional Skills Level 2	806	1.2
GCSEs	163	0.2
Below level 2	27,116	41.2
No Achievement	3,532	5.4
Total	65,768	100.0

Source: NPD (KS5) and ILR data for KS4 leavers 2010/11

Table 7: Highest qualification achieved by type of trajectory

	Transition to Apprenticeship	Transition to VE	Transition to Employment	Transition to NEET	Total
Level 3 or above	1.4	26.0	0.3	0.3	12.0
Apprenticeship	60.8	1.2	1.0	0.4	8.7
Level 2	14.8	50.9	29.4	7.7	32.6
Below level 2	20.9	21.5	57.9	80.0	41.5
No achievement	2.2	0.3	11.4	11.7	5.3
N	1,707	5,929	2,791	2,804	13,231

Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Table 8: Labour market outcomes of BL2 learners

	Paid Work in 2015	Earnings incl. 0	Earnings exc. 0	N
<i>All</i>	59.6%	4,010	6,724	65,768
<i>Main aim achieved</i>				
No	54.0%	3,349	6,200	17,104
Yes	61.6%	4,243	6,886	48,664
<i>Initial subjects enrolled in</i>				
Health, public services and care	57.0%	3,315	5,815	5,265
Engineering and manufacturing	71.8%	5,550	7,729	9,707
Construction	69.8%	5,398	7,735	14,826
Retail	67.1%	4,320	6,438	7,658
Preparation for life and work	46.5%	2,710	5,824	18,860
Other	52.8%	2,985	5,649	9,452

Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

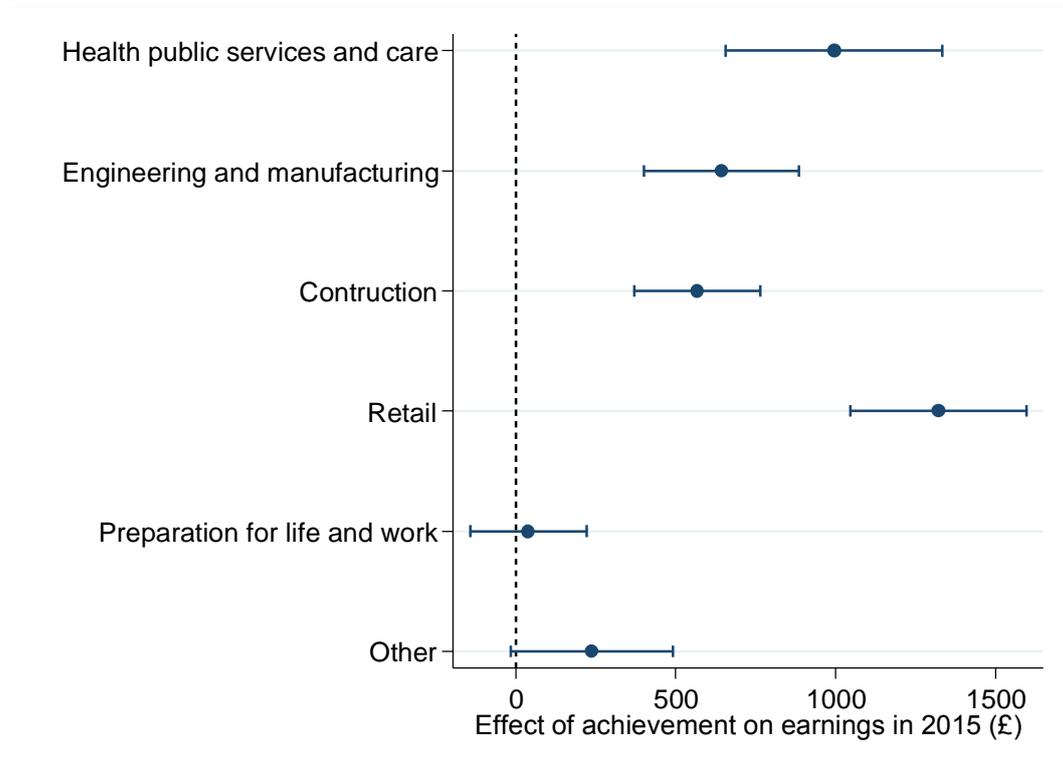
Table 9: Conditional association between BL2 achievements and labour market outcomes

	(1) Earnings incl. 0	(2) Paid Work in 2015	(3) Log of earnings
Main aim achieved	510.4*** (48.90)	0.0464*** (0.00441)	0.167*** (0.0162)
<i>Initial subjects enrolled in</i>			
Health public services and care	497.1*** (86.00)	0.0695*** (0.00764)	0.105*** (0.0289)
Engineering and manufacturing	1,406*** (71.02)	0.138*** (0.00648)	0.214*** (0.0225)
Construction	1,146*** (64.68)	0.107*** (0.00583)	0.191*** (0.0208)
Retail	833.9*** (76.37)	0.126*** (0.00692)	0.134*** (0.0246)
Other	-138.9** (69.04)	0.0205*** (0.00614)	-0.0685*** (0.0240)
Individual characteristics	Yes	Yes	Yes
College characteristics	Yes	Yes	Yes
Observations	58,832	58,832	36,067
R-squared	0.145	0.086	0.084
Mean	4010.5	0.596	5875.9

Note: Marginal effects of a probit model are reported in column 1. OLS regression coefficients are reported in columns 2 and 3. The omitted reference for subjects enrolment is 'Preparation for Life and Work'.

Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Figure 6: Effect of achievement on earnings, by subject area



Note: Estimated earnings effects of achieving a BL2 course by subject area, obtained from a regression model interacting achievement with subject area.

Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Appendix

Sequential and cluster analysis

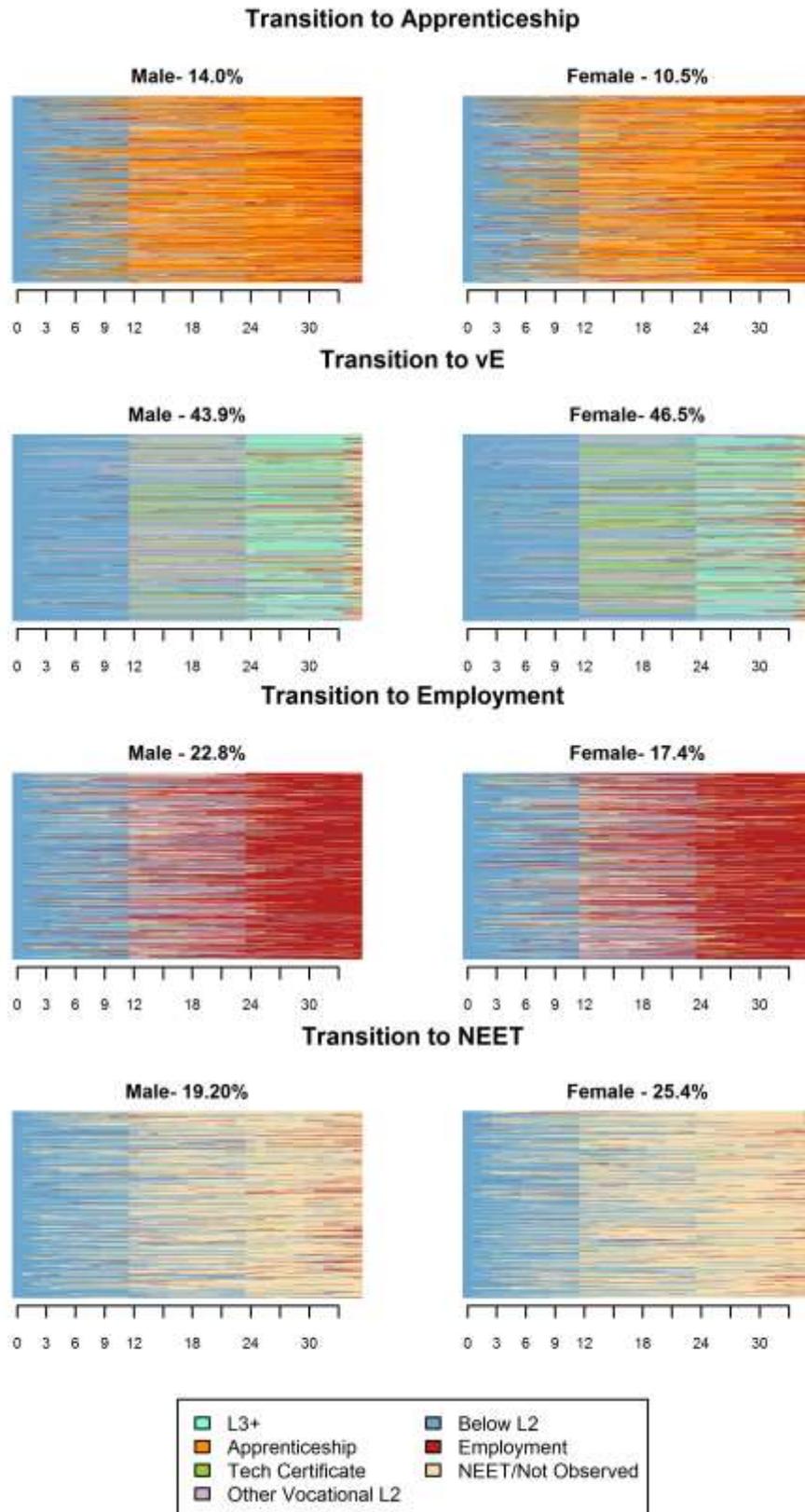
Sequence analysis has been used in various studies to explore the path of young people from secondary school to upper secondary, vocational and higher education and into the labour market (Speckesser et al., 2015, Brzinsky-Fay, 2014 and Dorsett and Lucchino, 2013). The aim of the sequence analysis is to identify similarities and differences in individual trajectories of education and labour market participation of young people by looking into an entire sequence of continued and changing monthly status variables. In comparison to other panel data methods, sequence analysis does not aim to explain particular transitions or status changes, but to visualise and cluster whole sequences as one entity and to identify typical patterns.

Following Brzinsky-Fay et al. (2006), the individual sequences are graphed in sequence plots, which show the sequence of different monthly status variables of one person as one-line relative to the elapsed duration after KS4 in graphs. The different colours used in the graph denote the different statuses in each month, so that the graphs allow for a visual understanding of the size of those groups making specific types of transitions over time. To facilitate the interpretation of the graphs, sequences are ordered by how similar they are. This sorting is achieved using optimal matching algorithms¹², which reduce the variation between sequences based on distance measures.

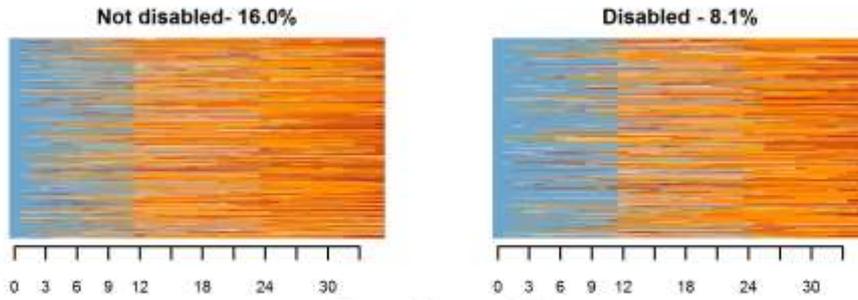
In addition, we run a cluster analysis based on the distance measure derived from the sequential analysis. We used the ‘agnes’ package from R and used the Ward's method. We then display the sequences for various numbers of groups. We decided that four groups were the most meaningful way to partition the data. These four clusters can be interpreted as a data-driven typology of BL2 learners, defined in terms of learning participation and labour market outcomes.

¹² Because optimal matching is computationally costly due to theoretically near endless different sequences, we used a 20% of the sample of the BL2 learners from Table 1 above. Overall, the analysis is supported by 6,485 fully observed individual biographies, which were included in the optimal matching procedure

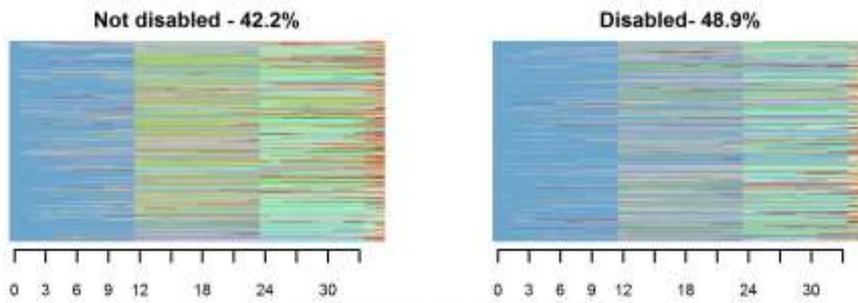
Figure A1: Clustered education and employment sequences of ‘Below Level 2’ learners



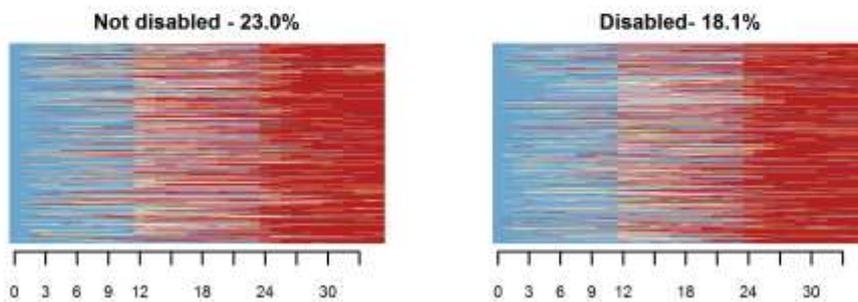
Transition to Apprenticeship



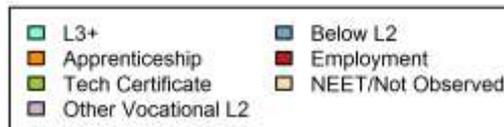
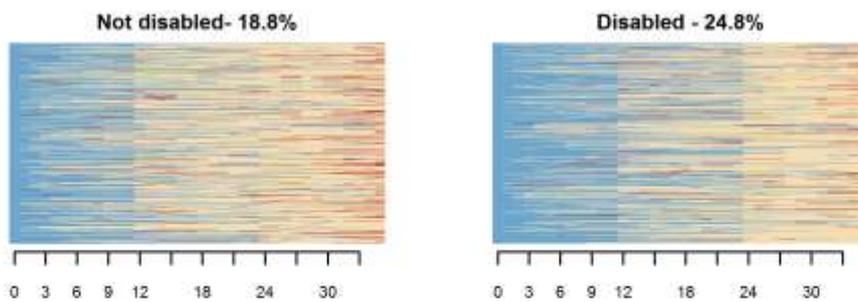
Transition to VE



Transition to Employment



Transition to NEET



Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Table A1: Marginal effect of achievement interacted with subject area of BL2 course

	Apprenticeship	Other VE	Employment	NEET
Main aim achieved	-0.0263*	0.227***	-0.0782***	-0.123***
	(0.0160)	(0.0224)	(0.0161)	(0.0123)
Achieved X Health public services and care	0.00699	0.0409	0.0225	-0.0704***
	(0.0320)	(0.0445)	(0.0335)	(0.0267)
Achieved X Engineering and manufacturing	-0.0240	0.108***	-0.0458*	-0.0379*
	(0.0243)	(0.0341)	(0.0255)	(0.0219)
Achieved X Construction	-0.0155	0.0775**	-0.0207	-0.0413**
	(0.0208)	(0.0347)	(0.0230)	(0.0202)
Achieved X Retail	-0.0598**	0.164***	0.0116	-0.115***
	(0.0249)	(0.0395)	(0.0296)	(0.0239)
Achieved X Other	-0.00988	0.0411	-0.0367	0.00547
	(0.0266)	(0.0390)	(0.0300)	(0.0221)
Health public services and care	0.0223	-0.0913**	0.0482	0.0208
	(0.0284)	(0.0407)	(0.0302)	(0.0227)
Engineering and manufacturing	0.0459**	-0.101***	0.0512**	0.00336
	(0.0213)	(0.0311)	(0.0208)	(0.0188)
Construction	0.0627***	-0.154***	0.0896***	0.00185
	(0.0188)	(0.0314)	(0.0207)	(0.0182)
Retail	0.0481**	-0.150***	0.0544**	0.0470**
	(0.0217)	(0.0358)	(0.0247)	(0.0191)
Other	-0.00460	-0.0280	0.0256	0.00700
	(0.0220)	(0.0341)	(0.0237)	(0.0185)
Observations		11,820		
Pseudo-R2		0.0995		

Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11

Note: The omitted reference for subjects enrolment is 'Preparation for Life and Work'.; Control variables include gender, ethnicity, disability status, IMD quintile, GCSE results, whether was excluded from school, college size and achievement rate.

Table A2: Highest level of education achieved three years after KS4 by initial destination after GCSEs

Initial post-16 status	Above L3		Level 3*						Level 2					BL2	None	Total	N
	H. App. %	Other %	A-Lev. %	App. Gen. %	Tech Lev. %	Adv. App. %	KS/NVQ %	Other %	Tech Cert. %	App. %	Other %	KS/FS %	GCSEs %				
HE/Above L 3	0.0	35.5	10.8	2.2	2.2	0.0	0.0	1.1	1.1	7.5	8.6	0.0	0.0	7.5	23.7	100.0	<i>0.1</i>
Mainly A-Levels	0.0	0.4	88.2	3.1	1.1	1.3	0.1	1.1	0.1	2.8	0.3	0.0	0.1	0.4	1.0	100.0	288.4
Mainly App. Gen.	0.0	0.7	1.9	72.8	3.4	2.0	0.1	2.1	0.5	5.7	3.2	0.4	0.4	3.2	3.5	100.0	35.2
Mainly Tech Lev.	0.0	0.6	1.7	4.4	69.2	3.0	0.1	2.4	0.7	5.3	3.5	0.7	0.4	3.9	4.0	100.0	23.5
Higher/Adv. App.	0.1	0.1	0.8	0.7	1.6	83.8	0.3	0.3	0.3	1.7	1.6	0.5	0.0	1.3	6.8	100.0	3.7
Mainly other L3	0.0	0.4	4.4	7.1	6.2	2.6	1.7	60.1	0.7	6.1	3.7	0.4	0.2	2.9	3.5	100.0	18.0
Tech certificate	0.0	0.4	0.7	2.8	23.4	2.6	6.4	9.1	30.2	8.8	4.9	0.3	0.1	5.9	4.5	100.0	14.1
Inter. App.	0.1	0.0	0.5	0.6	0.6	22.5	0.1	0.5	0.7	62.3	2.1	0.2	0.0	3.1	6.8	100.0	14.1
Other Voc. L2	0.0	0.1	1.9	15.9	11.6	2.8	2.3	10.1	3.4	7.0	33.6	0.4	0.4	6.1	4.4	100.0	54.6
Key/Functional Skills L2	0.0	0.0	2.0	6.4	12.7	2.2	1.6	3.9	10.6	8.7	26.1	10.2	1.0	11.7	2.9	100.0	2.3
GCSEs	0.0	0.0	15.0	13.1	6.6	1.2	0.5	5.7	4.0	6.6	19.6	1.6	14.5	6.1	5.5	100.0	2.6
Below L2	0.0	0.0	0.3	2.0	5.9	1.2	1.0	2.6	8.3	7.4	23.1	1.2	0.2	41.2	5.4	100.0	65.8
Employment	0.0	0.0	0.3	1.0	0.8	2.8	0.0	0.7	1.1	17.4	4.9	0.4	0.1	11.5	59.0	100.0	8.5
NEET/other	0.0	0.0	2.2	2.0	1.4	2.1	0.1	1.0	1.7	10.2	8.4	0.9	0.3	25.9	43.7	100.0	29.7
Not observed	0.0	0.1	22.7	11.5	3.3	2.0	0.4	6.7	1.4	6.5	5.5	0.4	0.3	9.6	29.7	100.0	76.4
Total	0.0	0.3	43.4	9.0	6.1	2.7	0.6	4.7	2.3	6.4	7.3	0.4	0.2	8.1	8.5	100.0	637.0

*Categories are referring to 'Mainly' A-Levels, Mainly Applied Generals, Mainly Tech Levels, etc. as Level 3 might be combined A-Levels and vocational education in KS5

Source: NPD, ILR, NCCIS and HMRC data, KS4 leavers 2010/11, Numbers in thousands (N) rounded to nearest 100

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