Neighbourhood, school and individual effects on success at GCE A-level: a multilevel analysis

Conference Paper Abstract

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Abstract

Introduction and aim of the research

Previous research has provided evidence of strong links between the socio-economic characteristics of students and their educational attainment. In particular, socio-economic status, parents' educational background, family structure and income and ethnicity have been shown to be important predictors of attainment at school.

In this research, information from different databases is used in order to investigate factors that can influence the success of students taking GCE A-levels in England, in particular A-level Chemistry. The characteristics of the schools (type, attainment and gender), the characteristics of the neighbourhoods where the schools are located, as well as the students' attainment on entry to school, are taken into account.

Data and methods

We use data on students' examination results for the cohort of students that were 17 years old in 2004 and we consider the five Chemistry specifications at A-level offered by the three awarding bodies in England. Students' prior attainment is based on the mean of their GCSE results.

Schools offering A-level subjects were classified into five categories: comprehensive and secondary modern schools, grammar schools, independent schools, sixth form colleges and further education and tertiary colleges. Their ability or attainment group was computed as the mean of the attainment of their students.

Not everything that influences students' success in a particular examination is their previous attainment and the school characteristics. It is necessary then to take into account background factors, such as the characteristics of the neighbourhood, which can be obtained from the Office of National Statistics. This research focuses on the following background factors: parental unemployment, qualifications, car ownership, density of population (proxy for rural/urban areas), lone parent status, ethnicity and deprivation index.

Students in the same school may have more in common than with students in other schools. Therefore, we use multilevel models to analyse the data. These models are a type of regression models that take into account the hierarchical structure of the data (students grouped in schools). In this research we model the students' probability of obtaining a certain grade given the school and background characteristics mentioned above.

Results

Many different analyses were carried out in an exploratory manner before deciding on the most efficient combination of students and school characteristics to use in the modelling stage. The models were fitted using the package MLwiN.

The variable that has the largest effect in obtaining a grade A in A-level Chemistry is the prior attainment. Gender and its interaction with prior attainment are also significant.

In terms of schools, the probability of a student getting an A depends on the type of school attended (grammar, independent, etc.). The differences between types of schools are statistically significant. The school attainment group plays an important role in the success of a student taking A-level Chemistry. The higher the average attainment of the students in the school, the larger the odds of getting a grade A.

Further models were fitted where socio-economic factors were taken into account. The significant effects, after adjusting for prior attainment are: lone parent status (negative effect) and qualifications (positive effect).

The findings of this research suggest that students' prior attainment has, by far, the largest impact on their later attainment and adjustments using socio-economic background factors or school characteristics are small by comparison. However, these factors explain a substantial proportion of the variation in the students' progress.

Full paper

Vidal Rodeiro, C.L. and Bell, J.F. (2007). Factors affecting examination success at A-level. *Research Matters: A Cambridge Assessment Publication*; 3: 14-19.