

How do you solve a problem like the transition to university? The use of MAXQDA in a qualitative evaluation of additional support classes for undergraduate biologists

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Background

Many students find the transition from secondary education to university difficult. In the UK, lecturers are frequently dissatisfied with the skills and knowledge that new undergraduates possess. In biology, poor retention of basic concepts has been attributed to a reliance on surface learning during A level and other pre-university courses. General academic and practical skills are also perceived to be weak. To address this problem, some university biology departments offer additional support classes for struggling students.

Research questions

We investigated additional support classes at three British universities with contrasting affiliations and student intakes.

1. How are additional support classes structured?
2. What is taught?
3. How effective are the classes perceived to be?

Preliminary data analysis

Audio-recordings of the interviews and facilitated discussions with the undergraduates ($N = 5$), lecturers ($N = 3$) and teachers ($N = 3$) were transcribed. Initial analysis entailed:

- a preliminary reading of the transcripts,
- formulation of an initial analytical framework.

Methods

Linked observation and interview methods were used to obtain perspectives from:

- undergraduates who had completed a full year of the classes
 - lecturers responsible for class delivery
 - secondary school teachers with an in-depth understanding of A level biology and its underpinning pedagogy.
- Unusually, the A level teachers visited the universities in person, observing the classes and discussing them subsequently with the lecturers who delivered them. As the teachers could draw upon their specialist knowledge in these discussions, qualitative data with high integrity could be generated.

Detailed analysis using MAXQDA

- MAXQDA was used to segment the data then code it by source and theme.
- In an iterative process involving two researchers, relevant content was identified and coded further using a refined framework of hierarchical codes (red, yellow and blue).
- The lexical search function in MAXQDA facilitated the identification of references to themes across the sources.

Red codes relate directly to the three research questions

Blue codes relate to transitional difficulties

Snapshot of the refined coding framework

Results and discussion

- We identified important similarities in approach across the universities. Additional support classes were introduced to target a particular sub-set of skills related to scientific investigation that university lecturers had prioritised. These included the component elements that contribute to an effective research report, including initial data collection (practical skills), analysis, and the conventions of academic writing. The classes were widely considered effective.
- Our findings contributed to an evidence base which informed national reforms to A level biology courses, to make them a better preparation for university. For example, the issues that were identified with practical skills informed the development of a new 'endorsement' assessment model for practical science in reformed A level courses.

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