

LSIS Practitioner Enquiry: Supporting students who are studying biology as a single science

LSIS Research



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Background

At Winstanley College, around 350 students elect to study biology at AS level each year, most of whom go on to take the subject at A level. Over nine years of teaching science at the college, I have become aware of three main groups of students choosing to study biology.

1. Those who study biology as a third or fourth subject alongside unrelated subjects.
2. Those for whom biology is important and relevant, but who are really interested in non-science related subjects, such as psychology and physical education.
3. Those who study biology as part of a science based course leading to a science based degree course or a career, such as medicine.

Our traditional class timetabling, where no 'setting' criteria was used, led to us creating diverse mixed groups in terms of both ability and interests. We noticed that those students who study biology, but whose real interests were in non-science related subjects, significantly underperformed in biology when compared to their other subjects – up to two grades lower. To try to improve the performance of students who studied biology to support non-science based subjects, such as physical education, psychology and vocational health studies, we decided to group all of these students into a single class and to adapt our teaching style in ways that would help to improve these students' performance.

Starting point

We identified 23 students in Year 12 who had chosen to study biology alongside other related, but non-science subjects. Most of the students had particular interests in physical education; a smaller proportion preferred psychology and vocational health studies. The predicted attainment level for this group was below what was normally expected for a typical biology class – most had projected 'Alp' grades of C or less, meaning that they were likely to find the traditional biology course difficult to access due to some of the demanding concepts. The students were of mixed socio-economic backgrounds, approximately half were male and half were female and all were of white British ethnicity. Many of the students had low expectations of themselves in the subject when compared to their other subjects.

Before the start of the course we interviewed the students to find out how we might go about delivering the usual content in a more relevant and approachable way. The interviews highlighted the importance of teachers:

- using cross subject examples when appropriate and/or examples that everyone would relate to
- taking time to listen to the students' specific interest in order to build relationships and develop a rapport which showed that they were valued and respected as part of the class team
- developing models and analogies to make difficult concepts relevant
- establishing routines to help the class work consistently over a prolonged time
- developing tasks that require thinking and application, and
- using humour.

Teaching and learning process

As the college is a 16-19 establishment, it is important to establish a rapport with the students quickly as well as learn their names. Like many teachers, I used an 'ice breaker' activity to do this, but the activity was also designed to help me find out subject specific interests, such as which sports they played/had an interest in, what subjects they were taking and whether they were linked to a career such as psychology or health care. Doing this allowed the students to identify other individuals

in the class with whom they had similar interests and could develop friendship groups. It also gave me a valuable insight into the 'bigger picture' of the student which I could later build on to develop their interest in the subject. During the teaching of the course I used the information to develop analogies to aid learning. These included describing a cell in terms of a sports stadium, describing osmosis/diffusion in terms of hospital dressings and describing surface area to volume ratios in terms of rugby players getting cold.

Impact

When we interviewed the students again at the end of their AS year, the students spoke of their appreciation of the way that the teacher had made the material more approachable through using analogies relevant to the students' particular areas of interest.

'They (analogies) have really helped me to understand the work better as it's been easier to understand and made it more relevant'.

'I really enjoyed having the work explained to me in a way that used my other interests to help me get it'.

Other strategies they found particularly helpful were:

- explaining material verbally
- providing page references of a written copy before the lesson, and
- the teacher explaining the material to students on a one-to-one basis (made

possible through the teacher setting up differentiated tasks).

At the end of the AS year, the students performed better than other students with similar subject choices who had started their year with the same Alp scores, the previous year. Of those students who were predicted to get a C grade, 35% achieved that grade or a better grade whilst only 20% had achieved the predicted C grade the previous year and 0% had achieved a better grade. More significantly, only 20% achieved an E grade or worse compared with 36% the previous year.

Conclusion

I believe that capitalising on students' enthusiasm for other related subjects, such as physical education is a good way of developing these students' enthusiasm for and enjoyment of biology. I also believe that it is critical for teachers to be aware of the interests and learning needs of their students, and the need to adapt teaching styles to accommodate them. The success of our single science pilot has led to the introduction of a human biology course geared specifically to those students whose interests lie primarily in non-science subjects. We have started to produce resources specifically designed for these students, in collaboration with the vocational health and physical education departments, which will be housed on a specially created website.

Contact

This study was carried out by David Woods who is Assistant Head of Biology and Human Biology Co-ordinator at Winstanley College. If you have any questions or comments, please email: Dave.Woods@Winstanley.ac.uk