



Case Study

The use of 3-D Technology to Deliver Science Curriculum

Dumfries and Galloway College

Kevin Wilson-Smith, Professional Development Manager

Summary

3-D technology can be used to add innovative and dynamically interesting dimensions to the teaching and learning process. The use of 3-d technology in a range of subjects can be used to emphasise, highlight and trigger attention processes to key learning concepts in the classroom.

Using a portable active 3-d projector and specific 3-d curriculum packs, the college has begun to integrate 3-d technology to offer the learners a new and exciting way to combine both visual and kinesthetic preferences to learning with a current focus on trialing its use in plant biology, human anatomy and physiology and sports science.

The technology is above all else a fun and engaging way of introducing anatomical models with research data supporting its use as an aid to more successfully identifying, describing and replicating diagrams and models during the assessment process.

About the Institution

Dumfries and Galloway College serves the needs of the whole of the South West region of Scotland. The College has an average of 9,000 students per year - 15% full-time and 85% part-time/other attendance. Approximately 20% are west of the Region based. The college offers a range of curriculum and is currently focusing on transforming the curriculum to offer flexible and innovative delivery methods.

The Challenge

First Impressions Last a Lifetime!

Delivering Anatomy and Physiology in the curriculum is often seen by the learners as a necessary evil when wishing to undertake learning in areas such as Sports Science, Hair and Beauty and Psychology. The resources used to deliver this type of curriculum have not moved on significantly since the introduction of PowerPoint and Promethean technology, often being used as drag and drop activities or even more simply as a method of projecting a 2-d image of anatomical models onto the whiteboard. The alternative to this has historically been to use dissection as a teaching methodology for learning about heart physiology; however this is often met with anxiety and moral dilemmas by our learners as well as being limited to the organs that can be used, partially due to health and safety risk. An innovative, engaging and most importantly fun way was needed to engage learners from the get go when learning anatomy and physiology, with the intention of getting learners to look forward to the next topic of anatomy covered. Generally speaking, Science examinations and other summative assessment rely on the labeling and description of whole organ systems that have often only been seen by the learner in a 2 dimensional format offering poor visual spatial learning experiences.

The Activity

The college began to review the literature to identify how technology could be used to enhance the learner's engagement in Anatomy and Physiology. It was identified that some American institutions were engaging in 3-d technology as an innovative teaching tool used in certain medical and veterinary schools. There had been one or two examples of the use of 3-d in British Primary Schools and it was assumed that the technology could be used within the FE sector. The 3-d projector systems allow fully interactive 3-d models to be projected into the centre of the classroom and manipulated by the lecturer or learner to have a 360degree, multidimensional view of the model.

Kevin Wilson-Smith, the Project Lead, contacted the Primary School to discuss the use of the technology and to gather information about the benefits and challenges of using 3-d technology in the classroom. The Primary School provided KWS with the company information (Amazing Interactive: see below for link to company website) and a demo of the software was arranged.

Following feedback from Lecturers and learners, a full 3-d projector system was purchased which included:

- A 3-d ready laptop
- A 3-d Active System Projector
- 30 pairs of 3-d glasses
- 2 learning packs (anatomy and Physiology, Core skills Maths)

The projector is completely portable and is now being used as a bookable resource, which is simply "wheeled" into any classroom. A number of classes have now piloted the use of 3-d, including a recent Science lesson where the technology was offered as an alternative to a "dissect and draw activity". The lecturer noted that learners who used the 3-d projector tended to replicate anatomical models in 3-d effect, rather than in 2-d.

The technology is now being trialed in more specialized areas such as:

- 3-d skin cells in Beauty therapy
- Hair follicles in Hair dressing
- Brain physiology in Psychology

The Outcomes

The impact can be measured both in terms of hard and soft targets. The initial grading of learners who use the 3-d projector appears to be significantly higher by at least 1 grade point when compared with a control group from the same class.

Learners have asked for 3-d projection to be used at the start of each anatomy topic. Equally, classroom evaluation scores on "How engaged were you with today's activity" was significantly higher than the average, scoring 8.6 on a 10 point likert scale. In reference to sustainability, the projector is a one off cost that comes with technical support from the provider company.

There will be the outlay of purchasing additional learning packages as they are developed, with current developments expected in the area of Motor Vehicle and Engineering. The investment of a 3-d projector system offers efficiencies in terms of preparation time for the teacher and appears to be very good value for money.

The projector system can be used as a standard projector when not being used with 3-d packages and could even be used as a rentable resource for local companies and adjoining Universities (e.g. UWS Nursing School).

Lessons Learnt

It was found that the technology could be found cheaper elsewhere but did not necessarily offer the same amount of technical support and some learners were not comfortable wearing the 3-d glasses. However overall the project has been a success and the college

hopes to extend the usage to a more diverse range of curriculum over the course of the academic session.

Useful Links

Amazing Interactives website:

<http://www.amazing-int.com/>

Video of Project by Abbey Primary School:

http://www.youtube.com/watch?v=9y_UajsvKJw

Disclaimer

The Regional Support Centre Scotland supports the development of educational e-learning. We may refer to specific products, processes or services. Such references are examples and are not endorsements or recommendations and should not be used for product endorsement purposes