University of BRISTOL

Graduate School of Education

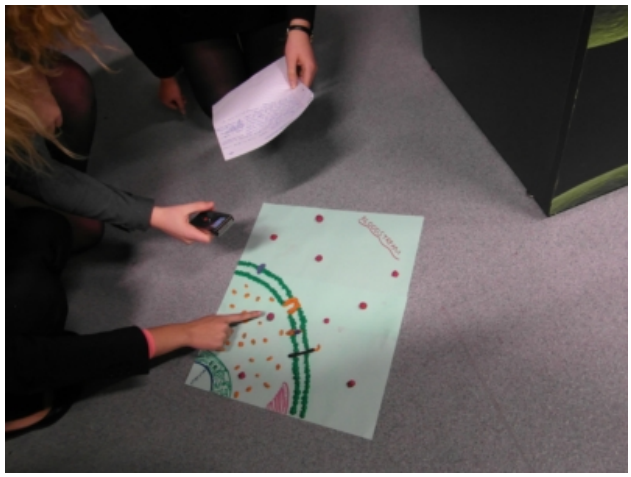
Research Briefing No. 20

Animating Science

Key findings and implications for Policy Makers

It has recently become possible to create a short animation in a school science classroom using a digital or mobile phone camera, Plasticine and freely downloadable software such as Windows Moviemaker within one or two lessons. This project explored working with secondary and primary school teachers to pilot creating animations as a means of learning about a range of different science processes.

It was found that making animations in school was enjoyed by nearly everyone and that the animations could be made within a teaching session by students ranging in age and ability from grade 4 to grade 12. The students themselves reported that talking in their groups during the task and seeing and discussing other groups' work were the most help to their understanding of the science concepts being animated whilst making the animation models with modelling clay (Plasticine) or drawing was enjoyed the most. It is concluded that that making animations enables constructivist learning opportunities that centre on social interactions between students and their teacher and between students themselves during the creation and evaluation of multiple representations of a science process.



The research

The research project, funded by the National Science Learning Centre, aimed to explore which activities within the process of creating stop-motion animations in science lessons, promoted learning and how learning activities involving this type of animation could be effectively deployed in teaching science at different levels. The research took place through observation and data collection in local schools. Participants for the study were recruited by contacting teachers previously known to be interested in research opportunities either with the local Science Learning Centre (responsible for continuing professional development) or with the School of Education (responsible for pre-service teacher education). The resulting participants were students from four classes (years 1, 4, 8, and 12) whose current topic was viewed by the teachers as suitable for animation.

Theoretical Background

Much of science learning concerns understanding processes that cannot be easily observed as they are too small, too slow or on too large a scale (Webb 2010). In animation these unseen processes are emphasised and reinforced with multiple, linked representations combining to enhance understanding (Kozma 2003). Indeed Hoban & Nielsen (2013) show that all the different stages student teachers followed in creating an animation: researching, storyboarding, modelling, taking photos etc., were important to their learning the underpinning science creating a cumulative semiotic progression with meaning building from one representation to the next to promote learning.

Research design

This research study, largely exploratory in nature, followed a mixed methods design. It combined collection of quantitative data on student attitude to making animations and their perception of how the different activities supported their understanding of the science with more qualitative data sourced from teacher interview and non-participant observation during the four science lessons themselves. The quantitative data was sourced through use of closed questions in a short student survey designed to be easily completed by even young (Grade 4) pupils. The researcher joined each of the four lessons, acting as a learning support assistant and, towards its end invited the pupils to complete the questionnaire survey. The teacher was interviewed face to face at the next opportunity once the lesson was over.

Further information

Each teacher chose to manage the lesson or sequence of lessons on animation being observed slightly differently however, in every case it was presented to the pupils as a way of consolidating their learning on the current science topics. Year Four students spent the morning making animations to show how filters and sieves work, Y8 a lesson on breathing and oxygenation, Y12's Biology lesson covered transport across a membrane and Year 11 researched a range of GCSE physics topics as revision. The technology used varied too with students using both familiar packages such as Powerpoint and learning new ones such as Windows Moviemaker. Lack of experience with the software did not appear to impact on its use, problems that arose were largely to do with image capture such as camera shake and taking too many photos which then took extra time to upload and edit.

Website

http://www.bristol.ac.uk/education/research/sites/animating-science/

Contact

Dr Jocelyn Wishart.
Email: j.m.wishart@bris.ac.uk **Phone:** 0117 3314497.