Research Project Details

EPSRC Rearch Project-Designing Our Tomorrows (DOT) (200k)

Inclusive Design-Introduction

Bill is co-investigator of this EPSRC Funded Research Project in collaboration with the Engineering Design Centre (Engineering Department in Cambridge), Royal College of Art (Henry Hamlyn Centre, London), and Ergonomics and Safety Research Institute (ESRI) of Loughborough University. Inclusive design is the *design of mainstream products and/or services that are accessible to, and usable by, as many people as is reasonably possible ... without the need for special adaptation or specialised design* (British Standards Institute, 2005).

This latest project builds on the highly successful and influential EPSRC funded i~design programme which has been running for nearly 10 years and is now in its third major phase. It has helped define, develop and promote inclusive design both in the UK and globally. Thus, this project builds on a substantial body of research and expertise, not only within inclusive design, but also the teaching of creative thinking within schools. The aim is to bring about a substantive and sustainable change in the way design is taught. As such it engages with a section of the population who have amongst the potential to bring about long-term change towards a more inclusively designed society, namely teachers of D&T.

Objectives

The focus on teachers is a deliberate policy. Research by Nicholl *et al.* (2008) on Leadership and Creativity in Design & Technology (D&T) 11-14 years, found that teachers and their belief systems influenced their classroom behaviours; that is, what they taught, and how they taught for creativity in the D&T classroom. Working with teachers, and their belief systems, is a means of engaging pupils, via their teachers, who are seen as the gatekeepers of inclusive design. To this end, the project team will work with teachers and pupils to develop high quality resources that help teachers to help pupils engage in, and learn through, inclusive design tasks. To do this, the project will develop an approach to inclusive design that is tried and tested by teachers and their pupils. A set of resources will be developed.

This is an on-going research project and more information will be available shortly.

Autodesk Research Project. £36k

Bill acts as a consultant to Autodesk (Education) Limited on a number of different projects. In Wroclaw, Bill is exploring lecturers' and students' beliefs about creativity and teaching and learning. This investigation includes planning and delivering a creative intervention that aligns rigorous engineering curricula to art and design with the view to developing a new creative design degree module.

This research project is part of a wider strategy within Autodesk Limited, which is aiming to explore how 1) their Digital Prototyping software can be used to inform creative design for the 21st century and 2), the role Education has in achieving this aim.

GATSBY-Creativity in D&T (330k)

The **Gatsby** Charitable Foundation *id*

Bill was Principal Investigator of this externally funded (GATSBY , 330k) research project that aimed to support the leadership of excellence in teaching and learning in design and technology (D&T) by:

- Developing a model of learning and teaching in D&T that explicitly develops creativity;
- Supporting heads of D&T departments to become more effective in their role as leaders of learning who are responsible for subject-creating and managing the D&T learning environment.

Research methods adopted (overview):
- 14 schools nationally participated in this research project over 2 phases;
- Questionnaires: 1 to 5000 pupils and another to 59 teachers; (pre and post intervention);
- Interviews with 15 teachers (phase 1); 50 interviews with teachers (phase 2);
- Interviews with 134 pupils (phase 1); 164 (phase 2);
- Survey 256 parents across 7 schools;
- Interviewed 6 eminent designers about their work;

This research has approached creativity from different perspectives including creative cognition, creativity and motivation, pupil voice, and creative leadership/teacher beliefs. Extracts from the dissemination conference are goiven below. If you would like to purchase a fully illusrated colour booklet (see below), then please email Bill on ban22@cam.ac.uk (subject to availability). If you want to purchase any of the resources then please go to www.mutr.co.uk.

Understanding Creativity For Creative Understanding

Bill Nicholl
Dr Ros McLellan
Dr Wafa Kotob

Design & Illustration
by
Matt Thomas

Creative Cognition

Students find generating original ideas difficult. Bill experienced this throughout his teaching career, where students would often generate clichéd or stereotypical design ideas based on popular culture or from existing products (see figure below). Here, one of Bill's students based his early radio design ideas on existing radios he had researched from the Argos Catalogue. Needless to say, his ideas were the same as the ones he had researched! To overcome this, Bill used a strategy which showed how looking at other products might help this student with generating more creative ideas. This was the beginning of a passion Bill has pursued ever since - teaching for creative design.

Generating ideas based on popular culture was something not only Bill's students did, as this research project found and reported. Love hearts and logos, as design ideas, were used by students across a number of schools (see fig. below). Thus many students find generating new ideas to be difficult.

This phenomenon can be described as fixation, a phenomeon defined within the creative cognition literature as a 'blind adherence to a set of ideas or concepts limiting the output of conceptual design' (Janson and Smith, 1991, p.3). There are studies available that suggest even designers can think in fixated ways. Interestingly this is a perfectly normal way of thinking. It is however, malleable, that is, it can be changed. This is really interesting from a teaching (and learning) perspective, but before discussing this aspect of the project, it is important to investigate how designers generated creative ideas, or to put it another way, avoided fixated ways of thinking.

Case study of designers

As part of this research we asked a number of eminent designers where they got their ideas from. This resulted in a number of case studies illustrating the ways in which designers avoided fixation, that is, weere able to think more creatively by deploying certain cognitive processes. One such process, the use of analogies, is illustrated below, by a fashion designer , Louisa Parris. Louisa's work shows how the properties of an old perfume bottle has informed her thinking about a dress she was designing. Looking at unusual things then, was one strategy Louisa used to help her overcome fixated ways of thinking. Examples of other cognitive processes are illustrated in the GATSBY Report.

ANALOGY

Sketches of glass bottle inform the design of dresses

Final design of dress

Louisa Parris - Freelance Fashion Designer

Students' outcomes from the project

Using the findings from the first phase of this research project, and drawing on related literaure, Bill developed many resources/strategies (see below) to help teachers plan tasks that allowed their students opportunities to think creatively (i.e. by understanding and using creative processes such as analogies outlined above).

Teachers introduced these strategies to their respective students and some of the outcomes are discussed below. In the electronics example below, students aged 11 years, used a standard alarm circuit configuration to generate some ideas based on their personal lives. Examples shown below include an alarm which senses the heat in a baby's milk bottle; the heat of the water in a baby's bath (which doubles as a bath toy); a water sensor that detects the height of the water whilst running the bath; and a broach which changes colour depending on the humidty (humidity sensor) which reminds the wearer to drink some water in humid conditions.


In the materials example below, students aged 12 years, challenged the notion that picture frames should always be square or rectangular; designing instead, these picture holders using flowers as inspiration.
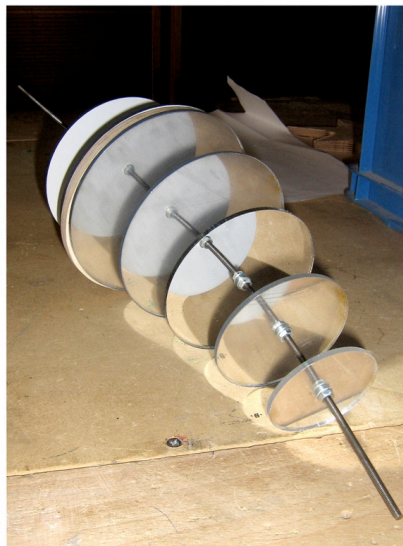
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Similar to above, students aged 13 years designed mirrors based on what they saw when walking around a buidling. I'll think you'll agree, these mirrors challenge the concept of 'mirror-ness' in the same way the picture frames do above. This is key to creative thinking.

Pupil research
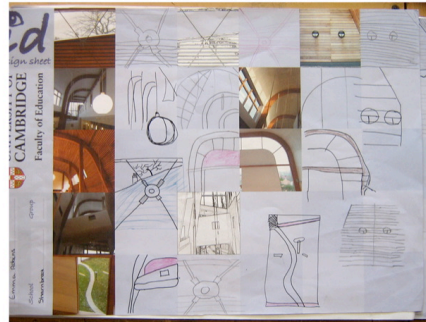
Pupil outcomes

In the example below, textiles students aged 13 years, designed and made jeans in the style of the fashion designer, Versace.

In summary, strategies such as challenging assumptions and/or using analogies, allows students the opportunities to experience and develop the ability to think creatively.

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