

The Design and Technology Association Education and International Research Conference 2007 – Paper Abstracts

Capitalising on the Utility Embedded in Design and Technology Activity: An exploration of cross-curricular links

David Barlex, School of Sport and Education, Brunel University, Uxbridge, UK

Abstract

Despite international support for cross-curricular activity involving design and technology, science and mathematics classroom practice in secondary schools has been unable to respond positively or effectively. This paper explores the ideas of purpose and utility as drivers to enable collaboration between teachers from these subjects and suggests ways in which this collaboration might take place.

Use of SketchBook Pro with Tablet PC (Tab-Sketch™) as a Design Thinking Tool in the Teaching and Learning of Design and Technology
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Abstract

This paper shares the preliminary findings from the first two phases of an exploratory study on the potential of Tab-Sketch™ as i) a design-thinking tool for design and technology (D&T) teachers and pupils in secondary schools; ii) a teaching and learning tool for D&T teachers; and iii) a platform to document design-thinking in the form of digital design journal. Tab-Sketch is an acronym derived from Tablet PC and SketchBook Pro, a computer software. The study, which is naturalistic in approach, was initiated in Nov 2004 and has evolved into three phases. Phases 1 and 2 were completed. Phase 3 has commenced in Aug 2006 and will end in Dec 2007. The insights and experiences gained from the first two phases include:

- the concept of 'growing ideas' conveniently and dynamically;
- the potential of the software for quick sketches and editing via features like layer and the range of rendering tools available;
- Tab-Sketch as a tool for the teacher-designer to dialogue with self and to practise rapid visualisation;

- capturing design conversations graphically and digitally between teacher and pupil; and
- ease in manipulating images and ideating presentation drawings.

These preliminary findings have shaped Phase 3 of the study which is still on-going.

Key words

tablet, design, thinking, drawing, sketching, tool

Computer Aided Design: Implications for pupil attainment and assessment

Alister Fraser and Tony Hodgson, Department of Design and Technology, Loughborough University

Abstract

Previous research has established that, at the very least, the introduction of CAD into design practice led to the better communication and presentation of ideas in the form of high quality outcomes. It recognised that the predominant use of CAD as a means of output is likely to be encouraged by its ability to directly support separate points of assessment rather than focusing on the act of designing itself.

This paper develops on the previous research undertaken by means of a web administered survey and highlights a strong relationship between CAD implementation and an increase in pupil attainment. The paper suggests CAD allows pupils to consistently meet a level of quality, manufacture and accuracy that is well rewarded by some specific points of assessment. Teachers observed an increase in the percentage average A*-C grades of around 10%. The paper reflects on a number of specific case studies which illustrate that despite the emphasis on final outcome it was apparent that CAD was contributing to not only the general quality of pupils' design work (in terms of presentation etc) but additionally the quality of design development.

Key words

CAD, CAM, attainment, assessment and design

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Constructing classroom learning environments that are interactive and authentic and aim for learner empowerment

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Abstract

This paper examines the concept of learning and teaching effectiveness as defined in Kimbell's (2001) assertion that the real products of design and technology classrooms are to be seen not simply in terms of '3D artefacts' learners produce but rather the 'empowerment' of young people. Assuming learner empowerment is the goal, the challenge for teachers is to provide more authentic instructional contexts that will motivate and enthuse pupils in their learning and give them a real sense of ownership and personal achievement. This paper argues that collaborative interaction and imaginative engagement in authentic design and technology contexts helps foster an approach to learning that is empowering for both teacher and learner. Toward this end, teachers need to be reflective and analytical about their own beliefs and practices, and acquire deep understanding of cognitive and motivational principles of learning and teaching. In this paper the author examines how teachers can model and promote greater learner autonomy and empowerment within supportive and creative classroom learning environments.

The research tutor worked collaboratively with teachers in two schools, primary (11 yr old pupils) and post-primary (14 yr old pupils), encouraging a greater emphasis on holistic teaching and more active and reflective forms of learner engagement.

In the primary school, a story, featuring a dilemma and a challenge, provided an authentic context by virtue of its orientation towards mutual engagement and intersubjectivity.

In the post primary school, a short four-minute video clip and other source material related to the G8 'Make Poverty History' concert provided the context for imaginative engagement and reflection. The aim in both schools was to provide real contexts for learning and a classroom ethos that would encourage student voice, purposeful and imaginative engagement, decision-making, action and reflection (learner empowerment).

Audio and video recordings, collections of pupils' work, teacher and pupils' questionnaires, field notes and reflective comments were used to provide the data. Semi-structured interviews with the teachers and pupils helped illuminate the contextual conditions that seemed to be significant in promoting more participatory and inclusive modes of engagement. Main findings indicated that facilitating student voice and more collaborative ways of working and thinking together helped change the classroom culture to one that empowered pupils in their creative thinking and learning. The quality of the talk-in-interaction, the nature of the teacher-pupil relationship and a more authentic form of pupil assessment provided the engine for driving the learning process forward in creative and personally fulfilling ways.

Key words

teacher effectiveness, engagement, interaction, autonomy, authenticity, empowerment

Unpacking a Research Activity: What was hidden in the panda's suitcase?

Gill Hope, Canterbury Christ Church University

Abstract

The research activity on which this paper reports has played a pivotal role in my developing understanding of young children's design capability over the past nine years, not just in terms of the how but also the why. Although I have referred to this activity in previous writings over the past six years, in focusing on it in this paper I seek to unpick the task as a 'design experiment' as defined by Gorand, Roberts & Taylor (2004), in that through experimenting with the design of a research activity, I was making discoveries about the subject of the study that I would not have done otherwise. The terms that I applied to the work during the course of the research were 'hands-on' or 'plan ahead' as ways of tackling design tasks, or 'design-as-you-go' vs. 'design-before-you-start' and these were not just labels I attached to children's working methods but also to my own fumbblings through learning to do research (Hope, 2001). I frequently conducted a pilot study with the children in my own class, since an early lesson that I learnt about combining teaching and research was that the first time I presented a design activity, I was learning how

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to teach it. In order to have reliable data on variations in children's learning, I had to develop activities that I knew well and presented consistently. This paper is, therefore, the life story of one of those tasks.

Discomforting the Orthodox: Using debates in the pedagogy of curriculum and critical thinking in design and technology teacher education

Steve Keirl, University of South Australia

Abstract

Given the breadth of the design and technology curriculum enterprise, designing a broad-ranging foundation course for design and technology teacher education students is problematic. Matters of content, process, pedagogy, educational theory and curriculum politics all have their needs to be met and understood.

This paper describes how debates have been used to articulate these kinds of needs in meaningful ways for the students. The debates are not simply an 'activity' that fills the assessment menu. They are shown to be, at once, interweaver of multiple issues and questions, modeller of critiquing-designing-making activity, and developer of intricacy for holistic design and technology education.

The paper explains the significance of the context in which the students and course operate and it presents the associated pedagogical rationale. In recognising that discomfort, as a component of critical thinking, is both valid and positive, it seeks to show how this use of debating contributes to a meaningful educational journey for the students.

Getting Ready for the Specialised Engineering Diplomas: Work placements for the 14 to 16 age phase

Tim Lewis and Gary Drabble, Sheffield Hallam University

Abstract

In the UK there is considerable activity at national level in developing the interface between school and training for employment. The intention is to introduce new Specialised Diploma courses into schools starting

in 2008. Early in the planning it became clear that several diplomas offer opportunities for design and technology (D&T) in schools.

A key feature of these diplomas is that the structure consists of learning lines comprising of several subjects coming together for the delivery in schools. However, a significant feature is the integration of work placement into the student learning experience. Sheffield Children and Young People Directorate (CYPD) has a strong commitment to ensuring diplomas are implemented successfully in schools therefore this research was undertaken to assess both the provision and opportunities for work placement in the 14 to 16 age phase. The research focused on commercial providers of education and training. Motor trade training was selected as an industry with the potential to contribute to the emerging specialised engineering diploma (www.engineeringdiploma.com/).

The research consisted of:

- a review of current qualifications for all aspects of the motor trades industry including those provided by the Institute of the Motor Industry;
- semi-structured interviews, using Wiersma's (2000) methodology, with motor trade commercial training and further education (FE) providers;
- observation and informal interviews with a group of Year 10 students on a motor trades work placement;
- informal interviews with teachers and tutors responsible for the above group.

The research outcomes identify issues concerning the provision of work placement within diplomas and particularly how it is integrated into the learning experience. Additionally there are implications for subject teaching of D&T, science and mathematics to ensure that students are prepared prior to work placement. The conclusion identifies examples of good practice but also raises issues about organisation and capacity. While this research concerned engineering the implications and issues are likely to be similar for other diplomas currently being prepared such as Manufacturing, Construction and the Built Environment and Hospitality and Catering.

Key words

design and technology, D&T, 14 to 19 age phase, work placements, vocational diplomas, engineering diploma

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Evaluating an Approach for Eportfolio Development

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Introduction

This paper reports on the evaluation of three years of eportfolio development work at Liverpool John Moores University with undergraduate students undertaking a final year design and technology module of key significance in determining their overall degree classification.

Set up in 2002 the module is assessed solely through an electronic portfolio. Whilst, on first impression, appearing not to value students' making skills, the module encourages risk taking and often results in high quality finished products. Common to the module from 2003 to 2006 was the use of grade-related assessment criteria. These were modified versions of criteria from similar modules where students would develop paper-based portfolios and three-dimensional outcomes.

The aim of the research was to explore similarities and differences in the pedagogical approaches that have been undertaken over the years and identify future trends and ways of further developing the students' experience. In doing so it was necessary to use a mixture of quantitative and qualitative methods that included: comparing assessment procedures by analysing documentation; comparing outcomes across the cohorts and interviewing tutors and students to provide insights into the processes of development.

Design Decisions in Design and Technology Education: A research project undertaken in Cyprus, Iceland, and England

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Gisli Thorsteinsson, Iceland University of Education
Eddie Norman, Loughborough University*

Abstract

The paper represents a research project on design decision-making in the area of design and technology education in Cyprus, Iceland and England. This was carried out in 2006-7 and explored the role of

teachers and their understanding for the importance of students' autonomy in decision-making when they are at age 11-14. In addition the paper looked at the congruity between decision-making opportunities included in national curricula and how teachers understand the relationship between such curricula and practice. The data collection is based on semi-structured interviews with teachers from Cyprus, Iceland and England, and reviews of the national curricula. In the study, the researchers compared their findings and reached common conclusions. This initial study articulated understanding gained from teachers of their practice and hence provides the foundation for an action research programme and further comparative studies. However, some discussions of possible improvements to practice in design decision-making within design and technology education are also included in the paper.

Key words

design decisions, design and technology, national curricula, comparative studies

The Contribution of Product Analysis to Fixation in Students' Design and Technology Work

Bill Nicholl & Dr Ros McLellan, University of Cambridge

Abstract

Design and technology (D&T) educators have pointed to a 'crisis' in creativity within the subject. Creative cognition literature suggests lack of creativity in design work is at least partly the result of 'fixation' (difficulty in generating novel ideas due to imagination being 'structured' by pre-existing knowledge). This paper applies these ideas in the context of current practice in D&T to shed light on how students generate design ideas and how a particular teaching approach, product analysis, influences these processes. Data are reported from the six schools involved in the preliminary phase of a Gatsby-funded ongoing research and intervention project¹. A number of methods including interviews with D&T teachers (N=14) and focus groups of students (N=126), lesson observations (N=10) and an analysis of documents and student work were utilised to address the question: 'How does the use of product analysis contribute to fixation in secondary school students'

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design work?’ Product analysis was found to be frequently used by teachers at different points in design and make projects, particularly during initial research work prior to the generation of design ideas and as a starting point for the generation of ideas during an idea generation lesson. Examples of these different uses of product analysis are outlined, however the impact each has on students’ generation of design ideas was similar: current practice leads to fixation as thinking is constrained down a particular path. Implications for practice are noted.

Key words

creativity, product analysis, fixation, generating ideas, creative cognition, 11-16 years

The Use of Sustainable Design Websites Within Design and Technology Education at AS/A2 Level

Peter C. Simmons, Loughborough University
Kevin Badni, Loughborough University

Abstract

Websites have become key knowledge and information sources within design and technology education for students. This paper looks specifically at sustainable design websites, highlighting the current literature on sustainability, and also sustainability’s integration into design and technology education. This integration focuses on sustainable design schemes, such as Practical Action’s Sustainable Design Award (SDA), and its website. The paper progresses to describe some initial trials to identify website use within ‘designerly activity’ for students aged 16-18. It examines their use of websites, in particular sustainable design sites and the SDA website, and whether these are used during their design activity. Further research that will be carried out to aid an ongoing analysis of how effective sustainable design websites are influencing design decisions is also outlined in this paper.

Key words

sustainable design, effectiveness, education, impact, methodology, website use

PICs, CAD & Creativity

Torben Steeg, University of Manchester
John Martin, University of Salford

Abstract

This action research project grew out of a concern that electronics in schools does not generally foster creativity.

Earlier work by the authors has suggested that incorporating microcontrollers (‘PICs’) – small, low cost, programmable integrated circuits – in electronic products developed by pupils in design and technology could increase opportunities for pupils to make creative design decisions, because they enable pupils to make more decisions about the ways in which their design will act and respond.

Three schools have carried out a radical reappraisal of one unit of work, developing new units that foster greater opportunities for (and recognition of) pupil creativity by incorporating modern technology. The research question that all three schools sought to address was:

Does the use of programmable microcontrollers (‘PIC technology’) and computer aided design (CAD) enable teachers to arrange electronics project work so that pupils are better able to make creative design decisions, as compared to pupils’ design decisions in previous electronics projects?

The preliminary analysis of the data presented here indicates that programmable technologies can help enhance the degree to which pupils make design decisions, but that other factors in the approach taken to reaching that decision are also important.

Key words

creativity, ECT, electronics, systems & control, systems, microcontroller, PIC, teaching approaches, action research

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A Literature Review in Search of an Appropriate Theoretical Perspective to Frame a Study of Designerly Activity in Secondary Design and Technology

Donna Trebell, University of Greenwich (EdD student)

Abstract

This paper explores how literature in which socio-cultural theory is applied to learning (John-Steiner, 1985; John-Steiner, 2000; Vygotsky, 1978) can be used to frame a study of designerly activity in a secondary design and technology classroom. Having established the theoretical underpinnings of the study, the paper goes on to develop an appropriate research question, methodology and analytical framework, all of which are justified against the theoretical perspective. The paper concludes by explaining how the approach could be applied to studies in other areas of the curriculum.

Key words

social constructivism, socially, culturally, designerly, interaction, collaborative learning

PowerPoint Presentation

Linking Learning – The perceptions of teacher practitioners on becoming teacher educators
Su Garlick, University of East London, Kate Jones Teacher Fellow Caterham High School, Mary Roberts, University of East London

'Once a teacher, always a teacher!' The purpose of the research carried out by the Secondary team at UEL is to discover the perceived differences between teaching teenagers and teaching adults. It may be that something as simple as referring to the teachers as educators may do the trick. Imparting subject knowledge is a basic role of an educator, whatever the age of the person they are trying to educate.

Abstract

This piece of research contributes to the work carried out by Peter Boyd and his team. (Becoming a Teacher Educator: Guidelines for planning and reviewing the induction experience of new lecturers in the subject discipline of initial teacher education. Boyd, Harris, Murray 2006) It has been reported that while the

transition between school teaching and higher education (HE) work may look like a small shift of occupation and setting to the casual observer of education, individuals often experience the change as challenging and stressful. Many teacher educators have difficulties in adjusting to the academic expectations of HE-based teacher education work. (Ducharme, 1993) Is this because the perceptions of the school based teachers regarding what it is like to teach in initial teacher education (ITE) are not at all accurate?

The research is based on a case study involving Teacher Fellows who are on a one day secondment to the University from their schools. The Teacher Fellows had to apply for the role in summer 2006 and undertook formal interviews.

Once in position, guidelines were given for time allocation in different ITE roles to ensure a variety of experiences.

The teachers were fully aware of their inclusion in the research and agreed to be the subject of an on-going case study.

It was essential to identify the methodology for the project at a very early stage and to ensure that everyone taking part was comfortable with the approach. Teacher Fellows were asked to keep logs of their days spent at UEL as these could be used when analysing responses to interviews and questionnaires.

A base line questionnaire was set at the beginning of the year to indicate the perceptions of the Teacher Fellows before they became involved in the work. A questionnaire was given to the Teacher Fellows after one term to try to ascertain how they felt their work as a teacher in a school has helped to prepare them for work within ITE. Using the responses to these questionnaires, interview questions have been formulated and the interviews will be carried out in the next two weeks.

It is anticipated that by July, the majority of this research will have been completed and some conclusions will be made. These will then be shared at the conference in the presentation.

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PowerPoint Presentation CAD/CAM and Its Relationship To Creativity in Designing

Aede Hatib Musta'amal, Dr Eddie Norman and Tony Hodgson, Department of Design and Technology, Loughborough University

Abstract

Previous research in the Department of Design and Technology has explored the relationship of CAD/CAM and school based designing (e.g. Hodgson and Allsop, 2003, Hodgson and Fraser, 2005). Both within school based designing, and in national economic debates, there is an increasing focus on creativity as a key issue, and there is a need to understand the relationship between CAD/CAM and creativity, both in school-based designing and beyond.

This research area is anything but straightforward, because the definitions of creativity currently being advocated are vague (Spendlove, 2005) and multi-dimensional. Some view creativity as the preserve of the few, and suggest that it cannot be taught or learnt, but others disagree, and believe that creativity is present in almost everyone (Gilchrist, 1972), and that many people have the potential for a high level of creative achievement. A current position from design and technology educators might be that creativity can be recognised in all students (people) and can be facilitated and nurtured as an essential life skill.

Available definitions range through the characteristics of creative people, processes and outcomes (e.g. Amabile (1983,17), and most agree that creativity must be defined in relation to the perceived value of the outcome, although the criteria to be applied vary. Economic value is often prized of course, but sustainability is also becoming seen as a key agenda. It is also recognised that creativity is not unique to the arts, but also fundamental to advances in other areas such as sciences, technology etc (Department of Education and Employment, 1999).

This research project has begun by analyzing the reported definitions and from these definitions deriving the characteristics of people, processes, products and environments (or 'press', the 4Ps, Rhodes (1961), Runco (1997)) that are related to creativity. From this analysis each of these

characteristics has been related to corresponding research questions e.g. 'willingness to take risks' is a characteristic commonly suggested and the corresponding research question becomes 'Does the use of CAD/CAM within design and technology education support risk-taking?'

The PowerPoint presentation will begin by summarizing this analysis of definitions and characteristics of creativity, and the resulting research agenda.

The results of comparing this agenda with prior research concerning CAD/CAM will then be presented and hence the key areas for this research programme established. Pilot studies will be in the process of being planned, and feedback on these plans will be sought.

PowerPoint Presentation Reflections on PGCE Engineering

Mike Martin and Paul Spencer, Liverpool John Moores University

Abstract

The increased interest in specific engineering and manufacturing courses and qualifications has raised important issues about the nature of education for engineering and its relationship with design and technology. A number of authors have expressed their concerns and it is clearly important that this area be researched and debated.

Liverpool John Moores University has a long track record of developing design and technology teachers. In 2005 the University explored the possibility of running an engineering PGCE as a direct result of numbers becoming available from the TDA. The 2005-2006 academic year was used to plan the course and develop working relationships with schools and FE institutions involved in delivering engineering courses. Of particular interest was the development of engineering subject knowledge competencies following the framework of those developed for D&T by the Design and Technology Association.

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Poster Presentation

To What Extent is it Possible to Measure a Pupils Understanding of Design?

Designers In Residence, Loughborough

Background

Designers In Residence is an initiative that places practicing and passionate industrial designers into schools to run a series of workshops and activities. These workshops engage pupils in a mix of core skills (such as sketching and visual presentation techniques) and more holistic sessions such as design ideation workshops, designed to inspire the creative resolution of design briefs.

As an initial starting point the designers from the initiative run a brief activity which is designed to gauge the pupils' understanding of design and the concept of designing. This poster presentation records pupils' responses to this activity and discusses the extent to which pupils can distinguish the difference between drawing and designing. Similarly, this poster discusses to what extent the activity designed by the practitioners can be used as an effective measure of an individuals understanding of 'design'.

Method

Pupils are each given a Post-it note and encouraged to 'design' a toaster within two minutes. The responses are then collected and presented on a board.

Results

The resulting 'designs' were surprisingly common. Pupils' responses typically comprised of the expected functionality and form. For example, the toasters generally had a slot (more usually two) in which the toast was located; the majority are rectangular in shape, and have some kind of lever or handle to operate the internal mechanisms.

As a follow-on activity pupils were encouraged to pick an end user and a context from a pack of cards in front of them. They were then advised to brainstorm the implications surrounding these criteria and integrate solutions to these scenarios into their original toaster 'concept'. The changes in design solutions, product form and function were quite substantial and very often did not conform to the 'norm'.

Discussion

On reflection it was apparent that the students had failed to distinguish the difference between the activity of 'designing' a toaster (as requested) and that of simply drawing one. Despite this, it was re-assuring to note that students were often surprisingly very aware of the mistake they had made, particularly when reflecting on one another's work.

For example, pupils typically resorted to drawing what they perceived a toaster to look like rather than necessarily engaging in any 'designerly' activity. Despite this, after a period of reflection, pupils readily identified the mistakes they had made. That is to say, that the pupils in question were not unable to design and/or possessed little or no design awareness (in fact in this instance the pupils were actually very astute) but moreover, that they simply did not recognise the activity of designing as appropriate at that point.

For these reasons the extent to which this activity can be used as an effective measure of a pupil's understanding of design and the activity of designing, is at this stage unclear.

What is apparent is that pupils in viewing Designers In Residence as an extra curricular activity, did not instantly recognise the knowledge acquired in their D&T lessons (as they do with so much of their school work) as more widely applicable and as having implications outside of the classroom. Once the activity was recognised as design and technological activity (in the follow-on task) the pupils were generally more effective in addressing the 'designerly issues' at hand.

This poses the question; how can practitioners make pupils more aware of the implications and opportunities for design and technological activity in the real world and are there enough opportunities for pupils to practice the application of design and technological knowledge outside of a conventional D&T environment? This is the subject of a series of activities designed and offered by www.designersinresidence.co.uk.

The poster is available for download at www.designersinresidence.co.uk/research.

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Poster Presentation

Children and Innovation in Iceland

Gisli Thorsteinsson, research student at Loughborough University

Abstract

The poster shows a specific Icelandic Innovation Education model that is a simple way to teach students ideation skills. This model has been implemented in Icelandic comprehensive schools over the last fifteen years. It is founded on long experience through co-operation between students and teachers in Iceland.

The main emphasis is on 'ideation' or finding a solution to a problem or need discovered in one's environment and bringing it to its realisation. The Innovation process is problem solving based and does not require a specific body of knowledge. It is intended to exercise knowledge gained across the curriculum and life experience.

In innovative work the student's idea are in union as they are working on solutions to a problem or a need in their environment discovered by themselves. The development of the prototype provides a strengthening of the student's intuition and a deeper understanding of the prototype and its usefulness in the human world. This means that the individual matures through the innovative work and gains a new image of his or her world.

The poster shows ideas from children in conventional Icelandic Innovation Education classes and a few prototypes they have made of their ideas.

Key words

Innovation Education, ideation process, general education, prototypes, ideation, inventions, design

Poster Presentation

Piloting Ideation in a Virtual Reality Learning Environment

Gisli Thorsteinsson, research student at Loughborough University

Abstract

Innovation Education (IE) is a new subject area in Icelandic schools. The aim is to train students to identify needs and problems in their environment and to find solutions: a process of ideation. This activity has been classroom based but now a specific Virtual Reality Learning Environment technology (VRLE) has been created to support ideation. This technology supports online communications between students and teacher and enables them to develop drawings and descriptions of the solutions. The VRLE is Internet connected and the students work online with their ideas in real time. As this learning environment is new it is important to evaluate and explore its use and value in supporting ideation in the context of IE. The author has run a series of pilot studies to identify the pedagogical issues of using the new VRLE to support ideation within IE. This poster demonstrates the background of Innovation Education in Icelandic Education and reports the pilot studies.

The main aim of the pilot studies was to explore the ways in which ideation was developed in students when using IE materials within the VRLE. The researcher used the following research questions:

1. What are the essential learning factors relating to IE?
2. What are the central factors of the VRLE as used with in the project?
3. How can the VRLE be used to reinforce ideation in the IE context?
4. How do the students get their ideas and how do they manage to express them?

Key words

Innovation Education, Virtual Reality Learning Environment, ideation, ideation process, pedagogical model, case study pilot, action research, case study methodology, pedagogy, learning factors, inventions, design, brainstorming methods

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Poster Presentation

The FISTE Project: A future way for in-service teacher training across Europe, through Computer Supported Co-operative Learning (CSCL)
Gisli Thorsteinsson, research student at Loughborough University

Abstract

This poster forms part of the FISTE project (2004-2007) which is based on the need for innovative and effective ideas for increasing the efficiency of teachers' daily work. In essence, the project is aimed at finding new ways of how to teach in-service teachers in in-service teacher training and how the teachers themselves can learn and upgrade their knowledge and teaching methods by using ICT. The proposed project concerns the development of an in-service teacher course on national and on European level (see further on <http://bscw.ssai.valahia.ro/>).

Computer Supported Co-operative Learning (CSCL) Environments have given rise to innovative new ways to teach and learn. However, so far teaching and learning processes have been technologically driven as opposed to pedagogically led. This poster shows the development of pedagogy and its application for teaching, studying and learning with Computer Supported Co-operative Learning (CSCL) Environments. This is in the context of teacher education, where it has been devised for the support of in-service teacher education. This poster promotes an understanding of the implications of ICT technologies in education for teachers, learners, and educational decision-makers.

Key words

FISTE project, in-service teacher training, pedagogy, Virtual Learning Environment, Computer Supported Cooperative Learning, ICT

Poster Presentation

Innovation and Practical use of Knowledge
Gisli Thorsteinsson, research student at Loughborough University

Abstract

Innovation school activities in Iceland are based on a creative emphasis in both teaching and learning. The basis is conceptual work in the broadest sense, which involves a search for solutions to needs and problems in our environment. It can also be used to enhance or redesign current designs, products or solutions. IE is intended to be driven by an innovation process rather than subject content and as such is cross-curricula. The primary aims are:

1. To stimulate and develop the creative abilities of students;
2. To teach students certain processes; from identifying a context, developing their own concepts and realization with appropriate models;
3. To teach students to use their creative ability in daily life;
4. To encourage and develop the student's initiative and strengthen their self image;
5. To make students aware of the ethical values of 'objects' while teaching them ways to improve their environment (Thorsteinsson, 1996).

This poster presents the Innovation school policy in the Icelandic school system and a new cross curriculum school subject called 'Innovation and practical use of knowledge'. Innovation in this form is the result of long curriculum development work, aimed at developing a new model for education. This was done in co-operation between the school system and the work place. The new subject is placed in the national curriculum as part of the area for information technology and technological education. Innovation Education and Practical use of Knowledge are, along with Vocational training Design and Craft is the core of Technological studies in Elementary Schools. Aims, course content, knowledge, and technical aspects are then the same as those identified for the technologies as a whole.

The poster presents how the new subject has developed, its character, pedagogy, the ideology behind it, its ethical aspect and practical applications.

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Key words

innovation, InnoEd, technology, curriculum, creativity, practical knowledge, IT, ODL

Key words

Innovation Education, ideology, ideation, ideation process, pedagogical model, action research, pedagogy, inventions, design

Poster Presentation

The Pedagogy of Ideation in Icelandic schools

Gisli Thorsteinsson, research student at Loughborough University

Abstract

Innovation Education (IE) is defined as an innovative school activity. It has pedagogical values, in the context of general education. Innovation Education is based on creative emphasis in both teaching and course work. The mainstay is ideation in the widest sense. This entails the search for solutions to needs and problems in our environment or the improvement or further development of known objects. As the student uses a process of ideation, gaps in their knowledge base emerge and the student finds it necessary to research and gain appropriate knowledge to suit the particular ideation process they are involved in. The process is paramount; subject knowledge follows as appropriate. As the student acquires increased knowledge and experience of ideation, they can employ it in new contexts.

IE is based on conceptual work which involves searching for needs and problems in the student's environment and finding appropriate solutions or applying and developing known solutions. Innovation is often described as either:

- an invention which may be considered completely new;
- an improvement of an existing product or system; or
- a diffusion of an existing innovation into a new application.

Developing students' ideation skills is the main emphasis of the pedagogy of IE. By strengthening individuals' ideation in a general educational context they are meant to be better able to deal with their world and take active part in society.

The IE process is a simple way to teach ideation skills. The poster shows the fundamental steps in the innovation process as it has been promoted. Ideation skills are used at all stages of the IE innovation process.