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Does the Preferred Learning Style of Those Training for a Career in Design and Technology Differ Depending on Age?
Dr Stephanie Atkinson, University of Sunderland, England

Many universities now enrol students on their degree programmes from a broad age range with a variety of entry qualifications. This has caused a shift from an elite to a mass higher education system that has affected aspects of teaching and learning. Much research has been carried out into the relationship between preferred learning style (PLS) and effective learning. There is evidence to suggest that a large proportion of those in a specific profession have the same PLS and that there is no overall gender difference in respect of PLS. However, little seems to be known regarding age differences in the PLS of those studying for a given profession,

This paper briefly discusses existing PLS research and explains the choice of tool used to determine the PLS of the sample. It then reports on the findings of a small-scale study of 153 design and technology students (aged between 18 and 54) studying at three different universities in England. The results support the belief that there is a relationship between PLS and specific professions. However, they also indicate that the spread of PLS ratios lessen the older the students become, and that there are differences in PLS in terms of a student's age and gender.

The paper concludes that there are implications for teaching strategies if materials are to meet the needs of all students in mixed aged cohorts even if they are studying for a given profession. The findings would suggest that further research is required to identify ways in which classroom practice could be enhanced as a consequence of the evidence presented in this paper.

Key words: learning style, age differences, gender differences, design and technology, higher education, teaching and learning strategies

Photo-stories From Durham: a case study on assessing design innovation
Jenny Bain, Goldsmiths College, England

In 2002 the DfEE and DATA Strategy Group for design & technology recommended that research be undertaken to examine the extent to which - and the ways in which – innovation and team-work might be more fully recognised and rewarded in assessment processes, particularly within GCSE.

As a result of this, in January 2003 the Department for Education and Skills (DfES) and the Qualifications and Curriculum Authority (QCA) asked the Technology Education Research Unit (TERU) at Goldsmiths College to undertake a research and development project, 'Assessing Design Innovation', to develop a system of assessment that would measure and reward design innovators. This paper focuses on the 'live' classroom activity carried out as phase 2 of the project, designed to examine the activity and the pedagogy in use with teachers that enabled them to promote innovative performance in their students. It presents a case study of one such project that:
- outlines the factors influencing the phase 2 project structure and content;
- explores and the impact of handling and modelling collections on having and growing ideas;
- traces the emergence of a 'photo' storyline and its impact on learners and assessors;
- examines how the findings of the project influence phase 3 of the Assessing Design Innovation project, the construction of assessment activities that would explicitly promote evidence of the process of design innovation.

Key words: creativity, innovation, assessment, photo-story-line, handling-collection
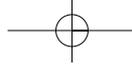
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Look At This: imagery training for technology students
Roy Barnes, Griffith University, England

This paper outlines a training program based on the regular practised generation and manipulation of neural images that has been used to improve the visual mental imagery (VMI) of design students. Most people can produce mental images, although there is variability in terms of the vividness, detail and control that can be achieved. Research indicates that VMI is an important feature of activities such as inventing and solving complex problems. Perceived images such as sketches or diagrams facilitate creative problem solving and therefore VMI should facilitate problem-solving within design activities. Further research has found that professional designers have varying degrees of imagery generation and manipulation that correlates with their level of expertise. Studies have found that it is possible to improve people's ability to create mental images and others have improved the control of neural images. This research has developed strategies to concurrently improve design students' vividness and control of their VMI. The application of the program within the Design and Technology learning environment and the influence on students' design ability is discussed.

Key words: visual mental imagery, training, problem solving, design ability

Teachers' Experiences of Teaching Young People About the Food Industry
Gill Bielby, University of Surrey, England

In design and technology (D&T), pupils are expected to design for manufacture in quantity, and simulate production and assembly lines (QCA, 2005). This presents a professional challenge for teachers as they seek to help young people to develop industrial knowledge and understanding. This paper discusses findings from a research project exploring the relationship between food technology (which is taught within D&T) and industry. Data was generated through semi-structured interviews with teachers of food technology and a questionnaire completed by a sample of members of the Design and Technology Association (DATA). Key findings relating to teachers' experiences of teaching young people about industry are presented. Issues include teachers' views on the importance of keeping up-to-date with technological developments, accessing teaching materials, and making contacts with industry. The support they receive and the challenges they face as they seek to give young people 'real life' impressions of industry are discussed.

Key words: secondary, teachers, food education, industry, work, industrial practice

Slow Down; how to stop spinning at KS3
Louise T. Davies, DATA
Torben Steeg, University of Manchester, England

Rotational or 'carousel' models, where pupils move to new material areas and teachers once or twice a term, dominate the organisation of the Design and Technology Key Stage 3 curriculum in England. This dominance has been maintained in the face of a great deal of concern expressed about the negative effects of such models on the quality of teaching and learning and in spite of the long term availability of various alternative models.

This paper describes a small-scale study of D&T departments where models other than simple rotation through different material areas have been attempted at KS3. The aim of the study was to find out what had motivated some schools to go against the dominant trend of rotational models at KS3 and to elicit from these schools details of their experience with alternative curriculum structures.

The study indicates that schools are successfully adopting a range of non-rotational courses at KS3. Most of the schools claim that the adoption of new structures has led to improved KS3 results and success at
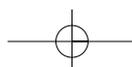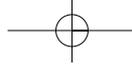
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recruitment to GCSE programs in the face of the new optional status of D&T at GCSE. Schools also claim improvements in pupils' perception of D&T as a subject as opposed to disparate material areas and a reduction in sex stereotyped views of the material areas.

The obvious objections to non-rotational courses circle around issues of teacher specialism. The schools in this study show that these objections are surmountable; D&T teachers do have the professional capability to extend their repertoire of skills and pupils benefit from their doing so.

Key words: KS3, curriculum organisation, curriculum models, curriculum innovation, rotational courses

Effective Student Industrial Designers: identifying formative factors
Dr Howard Denton, Loughborough University, England

Those students who are most effective at gaining high grades at A' level Design do not necessarily produce the best design at a university level. A small sample of first year undergraduate industrial design students with the highest performance in university design modules were interviewed to identify the factors they saw as formative in establishing them as good designers. In addition university staff teaching design to this cohort produced a reflective analysis of approaches to design they observed in new undergraduates; that is approaches developed during their school experiences.

It was apparent that these high-performing young designers had their appetites for design formed in play with construction kits in pre-school years. The majority of their primary and secondary school design experiences were bland and uninteresting to them. However, when teachers ran extra-curricula experiences in design it was apparent that a far more positive impression was made. This discussion may inform the on-going debate as to the

nature of design practice and teaching and learning the knowledge and skills required.

Key words: industrial design, teaching and learning, extra-curricula, secondary school design

Creativity in Practice… What not to do…
Melanie Fasciato, Manchester Metropolitan University, England
Maggie Rogers, Goldsmiths College, England

This paper describes research carried out in two UK primary training providers as part of the 'Creative Teachers for Creative Learners' project, funded by a Research and Development Award from the Teacher Training Agency. Over the past two years a study of trainees has been undertaken at Manchester Metropolitan University and Goldsmiths College, University of London, as part of a larger collaboration with Bath Spa University College. During the first year this looked at undergraduates who were training to teach in primary schools. They expressed their own notion of the 'creative person' using cartoons and further data was collected using a questionnaire. This year, a task that had originally been piloted by Bath Spa to gain an insight into where postgraduate trainees located creativity within their practice, was used to further explore the undergraduates' understanding of creativity while they were on school experience placements.

This paper draws on data collected from two cohorts of undergraduate trainees in each institution. Comparisons will be drawn between the two sets of data collected to establish how one varies from the other and possible reasons for this will be mooted. Initial findings indicate that the Goldsmiths and MMU trainees expect to find opportunities for creativity in most areas of the curriculum with assumptions that certain subjects offer more opportunities than others. However, as the Goldsmiths and MMU trainees reflected on the reality of teaching on their school experience placements the data gathered offered some interesting insights,

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which are particularly pertinent in this time of further curriculum change in primary education, including inhibitors of creativity.

Key words: creativity, primary, trainees

Developing a More Holistic Approach to Teaching, Learning and Assessment
Wesley Hamilton, Stranmillis University College, Northern Ireland

Stories in this research study were used to provide authentic design and technology contexts for Key Stage 2 (11 year old pupils) and Key Stage 3 (13 year old pupils), in two different schools. Both learning contexts involved the pupils in problem solving and creative working in groups, two key skills of business and commerce. Dilemma, mystery and intrigue within the different stories invited the pupils to think, act, and reflect on a number of open-ended issues, some of which had no immediate or obvious answers. Classrooms for the 21st Century, it is argued (Marton et al., 1993; Wallace, 1996; Watkins, 2001), need to provide contexts for learning that will encourage children to think logically, critically and creatively, to reason and reflect, and be less dependent on their teachers. These qualities are essential if pupils are to be equipped with the learning dispositions and capability needed to manage complexity and uncertainty, and engage in futures yet to be envisaged. Both stories were used to stimulate and initiate purposeful Design and Technology activity that challenged pupils to think and act, individually and collectively. The stories provided new environments for pupils to think in and be creative, and helped place concepts in real and meaningful contexts (Vygotsky, 1987).

In this more applied research study, the class teacher and researcher sought ways of integrating the development of positive learning dispositions with classroom pedagogy. The research hypothesis, that engagement with authentic and creative activity developed positive learning dispositions as well as technology capability, was tested. A framework of learning dispositions, organized into four domains, (EPIC): Expressive, Productive, Innovative, and Collaborative, attempted to provide a more holistic view of learning in the classroom. The framework facilitated more informed teacher observations and reflection on the learning process. It also formed the basis of a more divergent form of assessment and proved helpful in monitoring pupil engagement with authentic tasks. Five levels of engagement were identified: Level 1 indicated a reluctance to engage naturally with a task, with no evidence of exploratory or creative activity, while Level 5, recognised engagement as continuous, open-ended, reasoned and highly creative.

Data was generated using audio and video recording of pupil and teacher interaction and by keeping research diaries and examples of pupil work. The work is still at an embryonic stage but it has been successful in challenging teachers' views and conceptions of learning. The study has encouraged reflection on teaching and assessment practices at a much deeper and analytical level.

Key words: interaction, active engagement, authentic, learning narrative, feedback, formative assessment

Craft Histories, Textile Futures: the emotional affectivity of a 'future quilt'…
Dr Catherine Harper, The Surrey Institute of Art & Design, University College, England

This paper discusses how innovative and emergent textile design materials, processes, products and technologies are combined with traditional craft methods and aesthetics to create new poetic hybrids in conceptual and functional textile design.
Section 1: Historyground, pastground, futureground…
Section 2: Imagine…
Section 3: Magic…
Section 4: Coarse Craft
Section 5: Beds and Blankets
Section 6: Blush and Blanche…
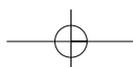
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The Impact of Computer Aided Design and Manufacture (CAD/CAM) on School-based Design Work
Tony Hodgson, Loughborough University, England
Alister Fraser, Loughborough University, England

This paper reports the findings of a national survey distributed to Heads of Design and Technology departments, with the aim of identifying the level of CAD capability that currently exists, and the nature of its implementation, within UK schools. It draws on teacher perceptions and conclusions from the study to identify further research that might be undertaken to help clarify the impact CAD/CAM has had on the activity of 'designing' within an educational context.

The role and impact that CAD may have on other aspects of Design and Technology education is described and provides for a more informed discussion on the students' learning experience, particularly where this might be promoted by CAD.

Key words: CAD, CAM, design, education, model, process

Managing Change in Design and Technology
Christopher Hughes, Edgehill College, England

The ability to manage change is now a desirable attribute for those who work in today's rapidly changing competitive environment. It is especially important for those who manage people and teams in nearly every type of industry and business. The education field is no exception. Placed in this context, this paper considers some of the issues that effect the management of design and technology in an ever demanding change environment.

It begins by placing Design and Technology in terms of the macro and micro influences on its change field. A number of models will be examined which relate design and technology to the external and internal pressures.

The work then goes on to propose a change model for design and technology. This emphasises the need to focus on team building as a methodology to manage change. To support the theoretical work a number of semi-structured interviews have been carried out in schools in the North West of England. Those interviewed include Heads of Department, subject teachers, newly qualified teachers and trainee teachers. The findings from this work provides an insight into current design and technology management approaches and how effective these are at creating a design and technology department that can adapt to change.

The field work has been used to evaluate the merits and demerits of the theoretical change models and how these may be used to develop a department that can cope with change.

Key words: management, change, models, team building, design and technology

The Technology Enhancement Programme (TEP) Millennium Research - a positive intervention to change the D&T curriculum
Prof Tim Lewis, Sheffield Hallam University, England, Nick Baldwin, TEP, England, Jenny Dein, Sheffield Hallam University, England and Peter Grover, Sheffield Hallam University, England

OfSTED reports published at the start of the millennium indicated significant weaknesses in the Key Stage 3 design and technology (D&T) curriculum. In 2002 HMI said:
'*…the choice of project, with contexts that are pertinent to pupils' experience, is crucial to successful learning in design and technology. Far too many projects are based on contexts that are seen as irrelevant or boring by pupils. Tasks need to encourage creative and innovative responses.*'
(OfSTED 2002b 7)

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The previous year's report highlighted possible reasons for this weakness. HMI said:
' *…many teachers are failing to keep up with new developments in the subject because there are few opportunities for appropriate INSET…*' (OfSTED 2001c 5)

The Technology Enhancement Programme (TEP) has a remit to develop the D&T curriculum therefore it was appropriate they instigated a development programme to facilitate change in the Key Stage 3 curriculum. This became known as the TEP Millennium Project.

By the year 2000 TEP had developed a range of new products and materials for use in the D&T curriculum and the initial focus of the Millennium Project was to develop a range of projects teachers could use to modernise their curriculum. To implement these in a number of schools TEP and Sheffield Hallam University devised a programme of development, targeted support and INSET. Financial support to participating schools gave D&T departments access to TEP products. This paper reports on the research outcomes of this project.

The research was to:
  • monitor the progress of D&T change in the schools;
  • assess the impact of change on teachers and pupils;
  • assess the longer term effects of the intervention on the D&T curriculum in the schools.

The research team used in-depth case studies compiled from observation and teacher interviews, followed by questionnaires.

The conclusion discusses the features that this intervention found to be effective in bringing about curriculum change.

Key words: design and technology, D&T, intervention, millennium research, Technology Enhancement Programme, TEP

Teacher and Learner Interaction When Exploring Products
Mike Martin, Liverpool John Moores University, England

This paper provides a report of a small-scale study that explored the interaction between a teacher and learner whilst evaluating products. It was hypothesised that the evaluation of a product unfamiliar to both would result in a different interaction than the evaluation of unfamiliar products. Patterns in verbal and non-verbal communication were recorded during the evaluation of two products, one familiar to the teacher and the other unfamiliar to both participants. The coded results showed a change in the behaviour of both participants, most notably the teacher. Overall it was found that the interaction was more symmetrical in nature when evaluating unfamiliar products. The interpretation of the results highlighted the importance of evaluating unfamiliar products in enabling learners to express their ideas about the origin and purpose of technological products.

Key words: teaching, learning, products, analysis, evaluation, interaction

Technicity as the Conceptual Basis for Explaining Innovation in Design and Technology
Dr Eddie Norman, Loughborough University, UK
Dr Owain Pedgley, Loughborough University, UK

At DATA's international research conference in 2004, Doyle introduced the concept of technicity. As a concept seeking to provide causal explanation of human evolution itself, as well as innovation and creativity within design and technology education, this was arguably the most significant new contribution presented at the conference and challenged those in design and technology education to fundamentally review the foundations of the subject.
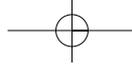
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Technicity might best be characterised by a creative capacity to:
  a) deconstruct and reconstruct nature, and
  b) communicate by drawing

…If further studies support the technicity hypothesis then reappraisal of the conceptual framework underpinning the educational curriculum might be of benefit: a technology of language rather than the language of technology. (67)

This paper reports one such further study and then considers how design and technology curricula might be reviewed in this context.

The research evidence which is used to explore the concept of technicity is derived from a detailed diary of designing written as one aspect of the polymer acoustic guitar project at Loughborough University. Ten characteristics of technicity are identified from Doyle's paper and the project diary is searched for corresponding examples. Numerous examples relating to each characteristic were identified. One example for each characteristic is given, with the evidence clearly supporting the conception of technicity as an aspect of human capability. Some corresponding curriculum review questions for design and technology education are accordingly identified.

Key words: technicity, innovation, characteristics, diary, guitar, curriculum review

Exploring the Impact of Pedagogic Approaches in Technology Practice upon the Construction of Feminine Identity
Dr Stephen J. Norton, Queensland University of Technology, Australia
Dr Ian S. Ginns, Queensland University of Technology, Australia

Females participate to a limited extent in science, engineering and technology (SET) industries that are central to innovation and building national economies. The causes of this under representation, in part, have their roots embedded in how females perceive school mathematics, science and technology subjects as being inconsistent with their gender identity. A participatory action research methodology was used to investigate the effect of two different pedagogical approaches for teaching middle school mathematics and science through technology practice on female students' attitudes to SET. Quantitative and qualitative data related to enjoyment, intention to undertake further such study, perceived usefulness and interest in career options involving SET, and perceptions of the investigative nature of the two approaches, were sought using, interviews, classroom observations, and a modified survey instrument. The findings indicated that female students responded in a more positive manner when careful scaffolding and the establishment of explicit linkages between the construction activity and mathematics principles were part of the pedagogical approach. In addition, there were specific types of projects that females found authentic. The implications of these findings for SET syllabus authors, pre- and inservice teacher educators, and classroom teachers are explored.

Key words: gender identity, pedagogy, attitudes, mathematics, science; technology

A Learner Centred Evaluation of Hypermedia-based Learning Resources in Blended Learning in Microcontroller Product Design
Tom Page, Loughborough University, England

The research reported here provides a comprehensive report and formative observations of the development and implementation of hypermedia resources for learning and teaching used in conjunction with a managed learning environment (MLE). Such resources were used to enhance teaching and learning of a microcontroller-based product design module at final year undergraduate level at Loughborough University. This work has taken place over a two-year period when

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such resources were developed and implemented. Such hypermedia-based learning resources were developed by the author and include text, graphical, video and sound based media.

The microcontroller programming development environment MPLab® IDE V.6.20 was supplied by the vendor of the microcontroller devices, namely Microchip Technology Inc. This environment is required for the programming of the microcontroller devices called PICs. In essence the students design and write the program code using MPLab® which can then be compiled into hexadecimal notation for subsequent programming of the PIC devices.

The managed learning environment referred to in this paper as 'Learn' is a university wide file-server system which is used to facilitate distance learning as well as provide support to many aspects of teaching, learning and assessment at Loughborough University. The work reported here focusses on the use of the MLE in support face to face learning as this module is not undertaken on a distance learning basis. The author has uploaded all relevant teaching and learning resources onto the MLE for accessibility by the students on this module. Moreover, hypermedia-based learning resources and assessments, in the form of pre-written assembly language programs and circuit building projects, were developed by the author, to enable the students to gauge their knowledge and understanding at staged points through the tutorial and laboratory sessions within the module.

In addition, this paper presents through case study the way in which this module is delivered and received illustrating how such resources are used by both teacher and learner. As such this proffers a paradigm for effective deployment of such supportive technologies and resources in learning, teaching and assessment of a design and technology module at undergraduate level.

Key words: managed learning environment, microcontrollers, product design, blended learning.

Designing in Food Technology – a curriculum intervention strategy in a one year design & technology postgraduate teacher training course
Marion Rutland, Roehampton University, England
Dr David Barlex, Nuffield Foundation, England
Margaret Jepson, Liverpool John Moores University, England

This study builds on previous work (Barlex and Rutland, 2004) exploring the effectiveness of a deliberate curriculum intervention strategy aimed at enhancing the design ability and design teaching skills of trainee teachers on a one year PGCE Design & Technology course. In this new study the focus is on the design ability and design teaching skills of food technology trainees. A parallel study was carried out at another institution and this will be reported in a future publication.

The trainee's initial design ability in food technology was gauged in two ways; using an audit tool and evidence provided by the design portfolio produced during the first food technology design activity for all trainees on the course. The development of food technology design ability was then gauged using evidence from the design portfolios produced during two additional food design activities. The study includes two sets of interviews with a sample of food technology trainees following the food design activities and a final interview at the end of the research project.

The ability to teach designing with food and its development across the one year course was gauged using data collected through classroom observation; trainee's teaching practice file and analysis of interviews with the sample of food technology trainees at the end of each teaching experience.

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The study will report preliminary findings from data collected September 2004 – December 2004 concerning the development of design ability within food technology and the development of the ability to teach designing with food technology for trainees at a single institution.

Key words: ITE, postgraduate, secondary, designing, food technology, curriculum intervention

Innovative Performance – how can it be assessed?
Inga-Britt Skogh, Stockholm Institute of Education, Sweden

In 2004 the Technology Education Research Unit (TERU) at Goldsmiths College in London developed a system of evaluative methods which measure and reward innovative performance (possessing ideas, developing ideas, as well as evidentially testing ideas). Together with Professor Richard Kimbell (Goldsmiths College) a group of researchers from Sweden have tested this evaluative tool in a Swedish upper secondary school. The Swedish research project involved a testing series based on the TERU assessment methods as well as studies carried out with pupils/students and teachers alike, revealing their thoughts on assessment issues in general. Some preliminary results from this very first application of TERU's assessment tool outside the UK, are presented in this paper.

The results from the Swedish pilot testing project have been found to be similar to the results found in the UK. The student's individual level of achievement in the test corresponds almost identically. Student attitudes to the test and test situation are also very similar. Just as in England, girls are relatively direct in terms of openness and reflection compared to the male students, while the boys on the other hand, tend to have relatively stronger ideas when compared with the female students. Another similarity is found in the fact that the Swedish students test

performance did not match their design grades achieved prior to the TERU based test, carried out by their teacher.

The Swedish research project includes studies on the student's attitudes towards different aspects of assessment issues. This portion of the study results is preliminary only. Among the results which have become apparent to date, are the tendency of many Swedish students to possess strong views about what they believe teachers bases their evaluations on, as well as on what criteria they would prefer their teachers to assess them on. Few students appear capable of defining orally how the concept of design or the involvement of technology could better serve the ultimate goal of more effective evaluation.

Key words: assessment, D&T, evaluation, performance, secondary school, assignment, United Kingdom, Sweden

ECT: Electronics, Creativity and Technology?
Torben Steeg, University of Manchester, England
Dr John Martin, University of Salford, England

There is small-scale research evidence (Spendlove, 2003) that Electronics and Communications Technology (ECT) is perceived by pupils as allowing little scope for creativity when compared with other focus areas of design and technology.

This paper reports a preliminary, small scale, investigation into the extent to which Spendlove's findings are replicated in a study of schools where ECT has a substantial presence in the D&T Schemes of work and GCSE syllabuses.

Based on a combination of qualitative and quantitative data, coupled with scrutiny of schemes of work, the paper investigates the relationship between the teaching approaches adopted in ECT classes and the extent to which pupils feel they are able to engage creatively
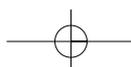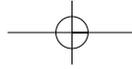
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with the subject matter. In particular, we examine the extent to, and ways in, which the use of:
- a 'components and circuits' approach;
- a 'systems' approach;
- a programmable microcontroller ('PIC') based approach;

supports or hinders pupils' perceptions of creativity.

The small sample doesn't allow definitive conclusions to de drawn, but the data do indicate that, at least in some settings, pupils rate work in ECT as providing a great deal of opportunity for creativity and that the underlying ECT technology used is not the only factor affecting pupils' creativity. This raises intriguing possibilities for further investigation.

Key words: creativity, ECT, Electronics, Systems & Control, Systems, microcontroller, teaching approaches

I Don't Enjoy Making the Folder: secondary students' views of portfolios in technology education
Dr Malcolm Welch, Queens University, Canada
Dr David Barlex, Nuffield Foundation, England
Krista Taylor, Queens University, Canada

This paper will describe a research study that investigated students' experiences with the use of design portfolios in their technology education. The research builds on previous work by the first two authors that investigated the use of portfolios by professional designers, teacher educators and secondary school teachers working in England and Canada.

Separate focus group interviews were conducted in England with one group of Year 10 boys in a technology college and one group of Year 10 girls in a technology college. Questions asked of participants focused on definitions and the advantages and disadvantages of using a portfolio, as well as students understanding of the purposes of a portfolio. Audiotapes of the interviews were

transcribed verbatim. Analysis of the data involved thematic analysis and concept analysis.

Analysis of the data has revealed that secondary school students participating in this study regard the portfolio as a burden requiring the production of materials that do little to enable the generation and development of ideas, and is driven by the assessment needs of the teacher rather than the learning needs of the student. Of particular interest is the view of those students who experience difficulty sketching and writing, for whom the design portfolio is seen as counterproductive in terms of enhancing their confidence and creativity. The paper will end with suggestions for using various types of portfolios to enable students to be creative through designing.

Key words: design education, portfolios, teaching and learning, assessment

Is the Steady Hand Game an Appropriate Project for this Decade? An analysis of the factors why teacher trainees in an ITT partnership are not moving projects forward
Nigel Zanker, Loughborough University, England

This paper considers the issues facing trainers, trainees and schools in an initial teacher training (ITT) partnership in the use of new materials and emerging technologies in design and technology projects. It considers problems with the frameworks offered by the Teacher Training Agency (TTA) and the Design and Technology Association (DATA) in meeting subject knowledge requirements with respect to schools' design and technology provision in the 11 to 18 age range.

Data are used from a survey of an ITT partnership and from Ofsted HMI Design and Technology summaries to explore the extent of problems with existing curriculum provision in Design and Technology. The validity of
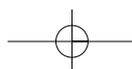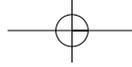
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traditional projects, such as the 'steady hand game' and wooden storage boxes are questioned. What is their merit in engaging and exciting pupils who are surrounded by everyday products, using new materials and technologies, which could be explored as design and make opportunities at school?

The paper discusses how schools involved with teacher training could make more effective use of trainees' recent subject knowledge and experiences, for example from their degree studies or industrial experience. It concludes with suggestions as to how trainees, during school placements, should be moving existing projects forward and developing projects that make use of new and emerging technologies.

Key words: design and technology, initial teacher training, inspection, training standards, electronics and communication technology (ECT), modern and smart materials, new and emerging technologies.

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