

Educational research into ICT and pupil motivation – a selection of abstracts

This document presents a selection of research into pupil motivation and ICT. Evidence from a range of educational research suggests that technology with effective teaching can increase motivation and make learning more interactive and enjoyable. This in turn can lead to improved pupils' attitudes and interest in learning.

Projects covered include:

- re-engaging teenagers using online learning
- pupils with Attention Deficit Hyperactivity Disorder (ADHD) and with emotional and behavioural difficulties (ebd)
- using ICT in subjects such as numeracy, literacy, geography and science
- how different types of technology have more of a motivational effect such as laptops and digital video

Far from being an exhaustive literature review, this collection of abstracts should be seen as a starting point for those interested in the theme of ICT and pupil motivation. Becta's Evidence and Research team welcomes discussion through the Research Network, and indeed, suggestions for further inclusions.

Eighteen articles and reports of relevance were selected and abstracted from UK and International research. These are predominantly research based and range from small-scale investigations to national projects. Examples from primary, secondary, special educational needs and non-traditional educational systems of learning are included.

Becta's Evidence and Research team welcomes discussion on this topic through the Research Network, and suggestions for further additions to this bibliography.

UK Research into pupil motivation

COX, M.J., 1997. The effects of information technology on students' motivation: final report. Coventry:NCET. ISBN 1871984289.

A study of primary and secondary pupils' use of ICT and their attitudes towards ICT and subjects which use ICT, based on an analysis of the literature on motivation. Findings from this study show that the regular use of ICT across different curriculum subjects can have a beneficial motivational influence on pupil learning. Responses from the pupils include an increased commitment to the learning task, their enhanced enjoyment, interest and sense of achievement in learning when using ICT, and their enhanced self-esteem. More than 75% of secondary pupils agreed or strongly agreed that using computers made their subject more interesting and more than 50% of all the school aged pupils agreed that using ICT helped them understand their subjects better.

DENNING, T., 1997. IT and pupil motivation: a collaborative study of staff and pupil attitudes and experiences. Keele University/Coventry:NCET. ISBN 0906784077.

Describes a national project set up to provide a better understanding of why and how ICT activities can motivate learners. Nine secondary schools from West Sussex, Sheffield and Birmingham LEAs were involved through questionnaires, action research and interviews during the academic year 1995 - 1996. The project also sought to establish the particular characteristics of ICT use that can be used to create more effective learning environments. Pupils were motivated by positive experiences of using the technology for a range of activities and 80% of teachers who used ICT regularly found that pupils were well motivated.

DUCKWORTH, J., 2001. Notschool.net research phase - final report.
<http://www.notschool.net/what/pubs/pdf/finalreport.pdf> (Accessed 11 December 2002).

Notschool.net is a virtual community that gives young people the opportunity to develop their self-esteem and be re-introduced to learning. This online research project looked at ways of re-engaging 92 young people between the age of 14-16 into an environment in which they were able to develop new ways of learning. These disaffected young people had been out of the more traditional educational systems of learning for a variety of personal and logistical reasons and learning through an online learning community was a key element in encouraging them to participate in learning again.

HARRIS, S., KINGTON, A., 2002
Innovative classroom practice using ICT in England: the second information technology in education study (SITES) http://www.nfer.ac.uk/research/down_pub.asp (Accessed 3 January 2003)

This Second Information Technology in Education Study (SITES) is part of a major international study by the International Association for the Evaluation of Educational Achievement (IEA). The research focused on six schools in England: three primary and three secondary, during the 2000/01 school year. The schools were selected on the basis of their innovative classroom practices, which were supported by ICT, rather than their use of innovative technology itself. Collectively the case studies revealed a number of positive impacts on the students who participated in the innovations including improved motivation; increased confidence and self-esteem; enhanced social skills; improved group-working and co-operative skills; and enhanced achievement.

HENNESSY, S., 2000. Graphing investigations using portable (palmtop) technology
Journal of Computer Assisted Learning, **16**, pp.243-258.

An evaluation of a weather project, undertaken by 48 lower secondary pupils using palmtops to collect and graph temperatures in Geography. Motivation and confidence in using the technology increased over a period of three weeks. Evidence of learning gains of averages and graph interpretation were observed, with ICT activities offering opportunities for active, independent learning increasing motivation.

MOSELEY, D., HIGGINS, S., et al. 1999. Ways forward with ICT: effective pedagogy using information and communications technology for literacy and numeracy in primary schools.
http://www.ncl.ac.uk/ecls/research/project_ttaict/TTA_ICT.pdf (Accessed 11 December 2002).

Series of 12 research projects led by the University of Newcastle looking into effective classroom pedagogy using Information and Communications Technology (ICT) for literacy and numeracy in primary schools. Evidence found that ICT offers the potential to improve standards of attainment in literacy and mathematics and increases motivation. Pupils of all abilities showed increased motivation to write, revise and redraft written work and writing for a wider audience added to the motivation to write. The increase in the quantity and quality of writing suggests that pupils were not losing motivation as writers, an issue that often becomes problematic as children get older, especially with boys.

PASSEY, D., 1999. Anytime, Anywhere Learning project evaluation focus. Lancaster: Lancaster University/AAL.
http://www.acer.co.uk/vi/upload/Entity13/UK/REP_3.pdf (Accessed 11 December 2002).

An evaluation of the Anytime Anywhere Learning (AAL) pilot programme in the UK, aiming to provide every pupil and teacher with access to a laptop on a 1:1 basis. 28 pilot primary and secondary schools were involved in the research, with benefits for learning observed after one year of laptop use, including improved standards of presentation, greater collaboration

and greater motivation. In particular, boys using laptops spent more time drafting and redrafting their work in English compared to those who did not use ICT and were more confident about presenting their work orally when supported by a Microsoft PowerPoint presentation. The motivational effects towards learning extended outside school when the laptops were used at home. Disaffected pupils and those with special educational needs were positively affected by the use of ICT, resulting in improved confidence, motivation and self-esteem.

REID, M., BURN, A., PARKER, D./ London:BF1., 2002. Evaluation report of the Becta digital video pilot project.
http://www.becta.org.uk/research/reports/docs/dvreport_241002.pdf (Accessed 11 December 2002).

Between October 2001 and March 2002 Becta ran a Digital Video (DV) pilot project involving 50 schools from across the UK. The aim of the project was to gather evidence of the impact of DV technology on pupils' engagement and behaviours, and to identify models of effective practice. Becta commissioned the British Film Institute to undertake an evaluation of the Digital Video pilot project. Their report looks at patterns of use and good practice in Digital Video, and considers how the technology has increased pupils' motivation, broadened access to the curriculum and has fostered both creativity and moving image literacy. The report contains key findings, analysis, case studies and recommendations. Findings show that the integration of DV into teaching and learning has the potential to motivate and engage a wider range of pupils than traditional teaching methods, so providing greater access to the curriculum, especially for those previously excluded from the traditional curriculum. Pupils were engaged to stay beyond lessons – into breaks, lunchtimes, and after school, and behaviour and on-task concentration was improved, including pupils with Attention Deficit Hyperactivity Disorder (ADHD).

WISHART, J., BLEASE, D., 1999. Theories underlying perceived changes in teaching and learning after installing a computer network in a secondary school. *British Journal of Educational Technology*, **30** (1), pp.25-41.

Examines the links between motivation and learning using ICT, following the installation of a computer network into a secondary school during 1996/7, using a representative sample of 1,463 pupils. The report concludes that the computer network has been beneficial to learning and increased enjoyment. Pupils found the production of correctly spelt, neatly presented work motivating, especially those who find difficulty producing such work by hand.

International research into pupil motivation

BECKER, H., 2000. Pedagogical motivation for pupil computer use that lead to pupil engagement. *Educational Technology*, **40** (5), pp.5-17.

This research investigated the extent to which different uses of computers during lessons motivated pupils to continue working at other times of the school day and outside school. Those teachers providing a more engaging computer activity in class time reported greater out-of-class computer use. This increased use of computers by pupils during their free time was independent of ability and socio-economic status. (US)

CHEN, A-Y., LOOI, C-K., 1999. Teaching, learning and inquiry strategies using computer technology. *Journal of Computer Assisted Learning*, **15** (2), pp.162-172.

Case study of a school in Singapore comparing the work of 'at risk' secondary pupils, with other academic pupils of the same age in several subjects. The 27 'at risk' pupils had

emotional and behavioural difficulties (ebd) and were involved in learning in an ICT-rich environment that encouraged them to do extra language-based activities out of term time. Greatest gains in performance were in English and computer-based subjects. The percentage of distinctions and passes for English, Mathematics, computer applications and elements of office administration increased overall. The students showed a high level of enthusiasm for ICT. (Singapore)

KRAMARSKI, B., FELDMAN, Y., 2000. Internet in the classroom: effects on reading comprehension, motivation and meta-cognitive awareness. *Educational Media International*, **37** (3), pp.149-155.

Examines the contribution of an Internet environment on pupils' reading comprehension, motivation and meta-cognitive awareness. Fifty two pupils from junior high schools were randomly assigned to either an Internet group or a control group. Findings revealed that although the Internet environment contributed significantly to the motivation of the pupils studying English as a foreign language, there were no actual improvements of achievement in English comprehension and meta-cognitive awareness. (Israel)

PEDRETTI, E., MAYER-SMITH, J., 1998. Technology, text, and talk: students' perspectives on teaching and learning in a technology-enhanced secondary science classroom. *Science Education*, **82** (5), pp.569-589.

A case study examining the teaching and learning impact of technology from the perspective of the pupil. The study during 1995-1996 was part of the Technology Enhanced Secondary Science Instruction (TESSI) project and involved 144 year 10 and year 11 secondary pupils. 64% of the pupils valued and enjoyed taking tests on computers and 71% of the pupils found learning Science in a technology-enhanced setting more stimulating and pupil-centred than in a traditional classroom. (Canada)

PIKULA, K., 2000. Gender and computer education: an observation of at risk girls in class. University of Michigan, United States.

Action research study of 36 at-risk secondary girls attending a six week Mathematics and computer summer school. The girls had a long history of truancy and low mathematical ability. Attending school was not a top priority. Findings revealed that using computers changed the behaviour of these pupils, who were more willing to listen and spend time in a classroom when using computers than in more traditional school settings. (United States)

ROCKMAN, S., et al., 2000. Laptop use and impact in the context of changing home and school access: third year study. 3rd year study.
<http://www.microsoft.com/education/?ID=AALResearch3> (Accessed 11 December 2002).

Results of a third-year study of the Microsoft, Anytime, Anywhere Learning (AAL) program in the United States, examining impacts on teaching and learning within laptop classrooms and the ways in which laptops might be supporting a more constructivist pedagogy. Pupils were motivated to work longer and harder, with an increased pride in their work and 80% of teachers reported that since introducing laptops into their classrooms, pupils more often explored topics on their own and worked on longer projects. The research involved 13 schools and 450 pupils. (US)

SOFTWARE AND INFORMATION INDUSTRY ASSOCIATION, 2000. Research report on the effectiveness of technology in schools. Executive summary.
<http://www.siiia.net/sharedcontent/store/e-edtech-sum00.pdf> (Accessed 11 December 2002)

A meta-analysis of 311 research studies presenting evidence of the effects of using ICT on pupil achievement, motivation and teacher-pupil interaction. The subjects where the motivational effects were strongest were in English and writing skills; Mathematics; Science; Telecommunications technology, including the Internet and video technology. Pupils who used computer-based instructions felt more successful in school, were more motivated to learn and had increased self-confidence and self-esteem. (US)

VALDEZ, G., et al., 1999. Computer-based technology and learning: evolving uses and expectations.

<http://www.ncrel.org/tplan/cbtl/toc.htm>

This paper reviewed research literature showing how technology can promote pupil learning in K-12 grade education. Evidence from a range of educational research found that technology increases motivation and makes learning more interactive and enjoyable. This in turn improved pupils' attitudes and interest in learning. Key findings concluded that computers improved the climate for learning, increased pupil motivation for subjects where technology was used and enhanced collaboration between home and school. (US)

VAN DAAL, V., REITSMA, P. 2000. Computer-assisted learning to read and spell: results from two pilot studies. *Journal of Research in Reading*, **23** (2), pp.181-193.

Two small-scale pilot studies examining the impact on motivation of reception-aged children using multimedia programs for reading and spelling. Pupils with low levels of motivation and feelings of uncertainty regarding their learning capabilities showed more positive behaviour during practice with the computer and less during classroom instruction. Children in the two classes made about 6 months spelling progress according to the norms and amount of non-task directed behaviour for pupils who used computers significantly decreased during both computer and classroom sessions. (Netherlands)
