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FOR LEARNING  
TECHNOLOGY



# ALT survey on the effective use of learning technology in education

*For the Education Technology Action Group*

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## Introduction

This consultation survey was set up as part of ALT's work for the Education Technology Action Group (ETAG), reporting to the Secretary of State for Education, the Minister for Higher Education, and the Minister for Skills, in 2014.

ETAG was initiated by the Minister for Skills to extend the work of his previous initiative, which set up the Further Education Learning Technology Action Group (FELTAG) in 2013. The report from FELTAG, *Paths Forward to a digital future for FE and Skills* was published in 2014. One of the report's recommendations under the section 'Capability and Capacity of FE and Skills Providers' was to

*encourage the development of programmes to professionalize FE governors, principals', managers' and teachers' use of learning technology, building on the best current models.*

The recommendation derived from surveys carried out with managers and lecturers in the FE and Skills sector, who identified the lack of leadership and support for learning technology innovation.

ETAG was set up to work across all sectors of education. The Association for Learning Technology is the UK's leading membership organisation in the learning technology field, and in this capacity took on the task of testing the FELTAG findings across a broader group of practitioners from all education sectors. In addition, given the extensive experience of ALT members, the survey collected evidence in the form of brief descriptions of case study examples of effective uses of learning technology.

This report summarises the findings of the ALT survey on '*the effective use of learning technology in education*'.

## The consultation process

The overall aim of the '*ALT survey on the effective use of learning technology in education*' was to enable Ministers to create a more secure foundation for effective policy, in order to build on what we already know about using learning technology.

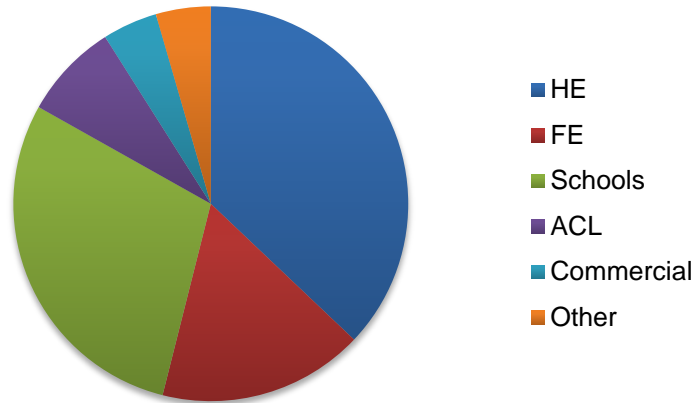
The survey was developed by ALT in the light of the findings of the previous survey reported by FELTAG on the experience and barriers to learning technology innovation in the FE and Skills sector. It was also influenced by the issues raised in the recent discussions in ETAG clusters in meetings and at <http://etag.support/>.

The survey was sent out via the ALT membership email list, and to the MirandaNet list, and members were encouraged to forward it to colleagues and networks in all sectors. Given the very tight timescale the survey was very brief, and there was little time to work at obtaining a high response rate.

## Distribution of responses

The comments and suggestions from active members of the community of teachers using technology form an extremely valuable collection of ideas and experience.

Of the 75 responses, 40% were members of ALT, and are well distributed across all education sectors (some members work across more than one sector):



Sector	No.	%
Schools	30	29%
Further Educations and skills	18	17%
Higher Education	36	35%
Adult learning	9	9%
Commercial	5	5%
Other	5	5%

## Analysis

The survey questions asked about the respondent’s sector, which ETAG ‘Cluster’ of issues they were responding to, their rating of potential barriers to technology use, their suggestions for actions, and details of a case study of their own effective use of technology in education. The survey questions are given in Appendix 4.

The closed questions were analysed and documented on the pie chart above, and the bar graph in Figure 1.

The open-ended questions were analysed using the method of ‘constant comparison’ to derive the main cluster descriptions represented by the comments. This analysis was carried out for the first 30 responses to a question, to develop the main descriptors within which each response could be categorised. The remaining responses were checked against these to ensure that no further categories were needed, and to add any especially well-phrased exemplars for a category.

## Barriers to innovation with learning technology

Respondents were asked ‘Please rate the extent to which you agree that the following statements describe barriers to effective use of learning technology that you currently experience’.

Figure 1 shows the responses, ordered according to degree of agreement from strong agreement at the top.



Figure 1: Average agreement with the descriptions of barriers to effective use of learning technology that you currently experience, where 'strongly agree' = 5; 'strongly disagree' = 1

The descriptions of barriers were derived from the survey carried out for FELTAG within the FE sector. The aim was to test the extent to which these were recognised across all sectors. There was general agreement with all statements.

In decreasing order of agreement they are, with generally strong agreement for the first four across all sectors:

- ◇ Lack of resource to provide release and support for staff to enable them to incorporate technology in their practices.
- ◇ Reliance on individuals to champion innovation and exploitation of their willingness to support colleagues.
- ◇ Lack of direction at a strategic level resulting in fragmentation of practice across provider curriculum areas and levels of work.
- ◇ Lack of credit and recognition for innovative uses of technology by key influencers such as government agencies, awarding bodies, governing bodies.
- ◇ Lack of headroom for managers to support innovation and risk taking.
- ◇ Focus on omission and error in inspection and QA, which does not encourage experimentation and exploration of the potential of technology.
- ◇ Little recognition that learning technologies are diverging between central sensitive data for administration, and independent and collaborative use by teachers and learners.
- ◇ Lack of funding to purchase technology.
- ◇ Lack of guidance on what would constitute outstanding and good practice across the range of technology use.
- ◇ Funding methodologies that are inimical to technology supported learning e.g. focusing on classroom activity.

- ◇ Staff not encouraged to use technology so many focus on the mandated administrative processes (e.g. QA requirements, registers, outcomes, summative assessment).

There are few exemplar organisation policies on technology for learning and teaching.

The strong agreement with the first four barriers identifies the critical problem as being a lack of leadership in all sectors that leaves innovation to individuals.

A strong policy statement that requires institutions and the official agencies to put a strategic focus on investing in the effective use of technology would clearly have real impact, therefore. It would legitimise and galvanise the innovators, and change the way quality is evaluated to recognise the value and the power of effective LT innovation.

Most of the remaining points indicate areas where change could be effected largely by a change in attitude, without extensive investment.

Lack of funding is an issue, but it has not stopped the innovation that has been carried out in recent years in all sectors. It is patchy, and local, and has struggled against an inhospitable system, and lack of maintenance of the IT infrastructure. Making the system hospitable to learning technology need not be unaffordable if the other barriers are addressed.

## Other barriers

In order to move beyond the barriers identified by the FE and Skills sector, there was also an open question inviting respondents to list other barriers. However, these only echoed or elaborated the barriers listed above:

### Lack of staff time and support

- ◇ Lack of Time
- ◇ Tensions over time for CPD
- ◇ Lack of experience by many teachers in the use of web enabled technology
- ◇ Teachers in HE rewarded far more for research than teaching

### Lack of support at senior level

- ◇ Older members of staff who do not see the merits of integrating technology in the classroom
- ◇ Appropriate policy support
- ◇ IT departments model themselves on corporations and keep themselves separate from academic contexts. Therefore needs remain unnoticed and unprioritised
- ◇ Lack of senior management buy-in

### Lack of leadership in effective use of technology

- ◇ In schools: little/no focus on supporting independent learning and the use of technology as a facilitator of student 'agency' or 'voice' - use of technology in schools supports current forms of examinations and learning: mainly through acquisition.
- ◇ A need for more specialist educational knowledge for achievement, and how technology fits in education for both achievement and attainment at government-strategic level in UK
- ◇ Lack of evidence base to support.
- ◇ Teachers' lack of knowledge about children's [hearing and] learning.

- ◇ Lack of teacher knowledge CPD focus on skills (to use in classroom tomorrow) rather than pedagogical change and consideration of evaluating impact on learning none.

### Lack of incentives

- ◇ Motivation.
- ◇ Lack of use of training accreditation that supports action research assessment regimes.

### Lack of funding for technology

- ◇ Variability of broadband speeds and bandwidth for the students.
- ◇ Difficulties over wider implementation within schools once the case for use has been established.

## Actions to encourage effective innovation in learning technology

In response to the barriers to learning technology innovation being experienced in all sectors, respondents offered their suggestions for the actions that would be most effective in countering these and in moving forward more rapidly and constructively. For each one there is a selection of the comments made (adjusted slightly in some cases to clarify wording). After the analysis of the first 30 responses all the comments had clustered into these proposed actions, and analysis of the remaining responses revealed no more.

Taken together these actions would go a long way to addressing the barriers listed in the previous section. All statements are verbatim or shortened when over length.

### Support teachers as collaborative innovative action researchers

- ◇ Learning from others' ideas.
- ◇ Sharing good practice events - organisation and regional eg JISC RSC-Eastern eFairs.
- ◇ Showcasing by Staff for Staff.
- ◇ Building a community via a coffee morning club style approach.
- ◇ Teacher collaboration to spread the innovation load.
- ◇ Encourage schools to share innovative practice with both positive and negative lessons learnt.
- ◇ Enthusiastic supportive peers.
- ◇ Willingness to experiment: allow teachers to experiment and sometimes fail, which may be a small short-term cost, but allows good innovation in the longer run.

## Encourage and support teaching innovation

- ◇ True innovation tends to be 'bottom-up', however 'top-down' policies are required to spread new TEL practices into the mainstream and as standard practice.
- ◇ Bring flexibility to institutional processes to encourage innovation.
- ◇ Develop a strong change management and implementation plan.
- ◇ Promote faculty champions who know what they are doing educationally (not just technologically).
- ◇ It is slowly changing, but technology should be driven by or with educators rather than just IT specialists who do not understand the science of learning.
- ◇ Prioritise pedagogy over technological means.
- ◇ Share case studies and exemplars of good practice that demonstrate benefits to teachers of utilising the technology and show how such use of technology can be scaled up.
- ◇ Be open and supportive of innovation.
- ◇ Support ground-up developments, as these are often overlooked.
- ◇ Guarantee teaching buy-out and time-release to develop teaching innovations.

## Build in time for continuing teacher development

- ◇ Allow time for the champions and time for the colleagues they are mentoring.
- ◇ Allow time to experiment.
- ◇ Establish mandatory training with time provided.
- ◇ Allow thinking, planning and reporting time for practitioners.
- ◇ Teaching is about experimentation and not always getting it right, this leads itself to trying out technology.
- ◇ Make time and staff available to support users in creating innovative ideas.
- ◇ Make staff use technologies in their development at the Institution.
- ◇ Time and staff available to train staff in the basics to get the confident and competent enough to want to be innovative.
- ◇ Give appropriate, adequate, regular training to staff and students.

## Leaders at all levels to take a strategic approach

- ◇ Use technology to solve a real problem.
- ◇ All new technology needs to have a clearly explicit 'why' as well as 'what'.
- ◇ Implementation requires a clear understanding of the adoption curve and how implementation strategies need to evolve as you move between the early adopter to the early majority to the late majority etc.
- ◇ Give us far-sighted managers.



- ◇ Persuade schools coordinators and government agencies to be proactive on this subject.
- ◇ Investment of private companies in the education sector.
- ◇ It is understandable that institutions look for ways to save money. We should certainly look for accountability in our experimental projects but we should also remember that in order to innovate we need to accept a certain level of risk.
- ◇ Freedom and encouragement given from senior leadership teams to trial and experiment with new technology.
- ◇ A 'project' style initiative with a clear and common set of aims - that are small enough for all teachers to implement and evaluate.

## Develop sustainable, education-oriented IT infrastructure

- ◇ Good computing systems that meet the university's objectives and knowledgeable support staff who will freely engage with academic colleagues to realise the desired outcomes.
- ◇ Reliable technologies.
- ◇ Ease of use.
- ◇ Easy access to the technology
- ◇ Learners expect use of technology in the 21 Century.
- ◇ Design technology for education that is fit for purpose (rather than repurposing, say, business software).
- ◇ Easy to use technology - the providers of technology need to understand the 'whirlwind of the classroom'.
- ◇ Do not force technology or specific parts of technology on teachers (e.g. do not force Microsoft on tutors/students who prefer Google Apps for Education).
- ◇ Teachers with real world experience of engineering environment, who are brave enough to break out of the MSOffice driven mould.
- ◇ Move away from the dtp/office based/ ad design skills which many schools seem to have as bread and butter ICT.
- ◇ Getting central IT to be interested in learning technology.

## Recognise and reward innovation in education technology

- ◇ Recognition of teacher good practice.
- ◇ Rewarding Champions with awards, voucher, money.
- ◇ Time, reward, and support for teaching innovation, as there is for research.
- ◇ Students awarding recognition for excellent teaching, backed up by the Pro Vice Chancellor (Education).

- ◇ Supportive senior management team.
- ◇ Strategic leadership from top managers.
- ◇ Central support and policy backing the use of technology.
- ◇ Accreditation to encourage quality outputs that allows for action research type methods.
- ◇ Giving schools credit for undertaking product development trials using carefully crafted research tools to capture lessons learnt.
- ◇ Opportunity to discuss among peers their experiences (good and bad).
- ◇ Anchor explicitly the introduction of innovative practices to promotion criteria to incentivise engagement.

## Engage students in active participation

- ◇ Students' willingness to engage.
- ◇ Learners' autonomy.
- ◇ Critical thinking.
- ◇ Increased fun in teaching and more engagement with students in class for improved engagement with materials studied.
- ◇ We need to get non-teachers into the classroom and get them showing kids how to build systems and program. We have around 8 robotics clubs for primary children. They always seem busy.
- ◇ Students need to kick up more of a fuss about what they are not getting for their £9000.

## Conclusion

This cross-sector study, building on the FELTAG work, has demonstrated that the barriers to innovation in education technology are common to all sectors. The actions needed to overcome them are therefore simply stated, for education as a whole.

In essence the teaching profession is asking for an innovative 'teacher-oriented' approach to policy in this area:

- ◇ articulate the vision that digital technologies contribute to solving some of the most difficult educational challenges
- ◇ focus on teachers as innovators: give them the leadership, support, time and recognition that enables them to collaborate in building community knowledge about the use of learning technology

This approach could transform the way all education sectors work to improve the quality of the student experience and learning outcomes, and thereby improve the productivity of education. Recognition of the importance of technology has already begun: the Minister for Skills established and promoted the work of FELTAG and endorsed its view that the sector must be "capable of responding to fast changing technologies and pedagogies".

No country in the world has yet developed an education technology policy that puts a focus on teachers as the engine of change and improvement (Kalaš, 2012)<sup>1</sup>. Policies and strategies tend to be top-down, and are therefore endangered by changes of government and leaders of institutions. Typically they focus on technology infrastructure rather than human capacity.

Nonetheless, teachers in all sectors have continued to innovate as their digital skills improve and more usable IT tools and resources become available. Without a system-wide approach, however, this work remains patchy and uncoordinated, and far less productive than it could be.

The overall recommendation arising from this study is to inaugurate a more 'teacher-oriented' approach to Learning Technology policy with the following actions:

- ◇ Support teachers as collaborative innovative action researchers
- ◇ Encourage and support teaching innovation
- ◇ Build in time for continuing teacher development
- ◇ Leaders at all levels to take a strategic approach
- ◇ Develop sustainable, education-oriented IT infrastructure
- ◇ Recognise and reward innovation in education technology
- ◇ Engage students in active participation

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<sup>1</sup> Kalaš, I. (Ed.). (2012). *ICT in Primary Education. Analytical Study. Volume 1: Exploring the origins, settings and initiatives*. Moscow, Russian Federation: UNESCO Institute for Information Technology in Education.

# Appendix 1: Case studies of effective use of learning technology (Schools)

As the survey findings above have demonstrated, there is LT innovation in all sectors, but there are no overall strategic actions for coordinating and supporting these efforts. This was a clear message from the FELTAG consultation. Ministers therefore have no large-scale evidence on which to base policy. The aim for this survey was to collect at least some local evidence, in the form of case studies.

Respondents were asked for exemplars of effective innovation, structured according to the intended outcome, the context, technology, design features, and impact. Word length for the responses was limited in order provide concise summaries of effective exemplars, with links to further information where possible.

Here we publish a selection of the case studies submitted, organised by the three main sectors, Schools, FE and Skills and HE. A more complete list will be published in due course in the ALT Repository.

The case studies within each sector are title according to the issue they address.

## Transition to HE

### **Intended educational aim or outcome**

To offer social and academic transition to c. 3000 international students coming to one UK HEI using a pre-arrival online course delivered to them in their home countries.

### **Context**

Higher Education - international students across all disciplines and levels (U/G; P/G taught and research) including visiting scholars and exchange programme students

### **Technology used**

An open source VLE with in-house customisations; conventional and unconventional communication tools for participants; in-house produced interactive learning objects, videos; some linked Web 2.0 tools to serve particular purposes.

### **Design features**

Eclectic approach; untutored but scaffolded environment; asynchronous; allows self-paced and flexible use by participants; option for connectivity between participants; simplicity of technology

### **Impact**

- ◇ Very successful - has run annually since 2011 with small modifications along the way- participant numbers have grown from 1600; 2100; 2500 and likely to be c. 3000 this year.
- ◇ Very good student feedback.
- ◇ Features they particularly liked were being put in touch with each other before they came and practical preparation for UK life and study and the institution they were coming to.

### **Additional comments**

More detailed info on our website:

[http://www.elanguages.ac.uk/get\\_ready\\_for\\_southampton.php](http://www.elanguages.ac.uk/get_ready_for_southampton.php)

## Developing 21<sup>st</sup> C skills

### **Intended educational aim or outcome**

To enhance students 21st century skills by effective use of technology

### **Context**

School, from Grade level 3 - 8

### **Technology used**

Internet, computers, digital camera, digital microscope, Printer, Scanner, Multimedia, educational software

### **Design features**

Major focus of the planning was to develop 21st century skills according to the Jonassen model, to develop a meaningful learning environment and to create independent learners

### **Impact**

Quicker learning, planning, implementation and resources facilitated students' learning styles - they are the digital natives in my school system

### **Additional comments**

Teacher training is equired

## Improving the learning of algebraic generalisation

### Intended educational aim or outcome

Mathematics is the science of patterns. Identifying, analysing, and predicting patterns is the source of the power of mathematics – whether it's a sequence of numbers, the structure of shapes, the change in the climate, the spread of a virus. But finding patterns in a few cases is not enough for mathematicians: the trick is to express the pattern so that it's true for all cases – to generalise it.

### Context

Early secondary school

### Technology used

Microworld, web, AI support

### Design features

- ◇ MiGen is an intelligent, computer-based support system. Young people enter a 'microworld' that presents algebra in a colourful, dynamic and visual format.
- ◇ The eGeneraliser: offers intelligent, personalised support to students as they use the eXpresser, giving them hints and clues as to what to do next.
- ◇ The ecollaborator: allows students to reflect, share and discuss their patterns with others, compare approaches and refine their work.
- ◇ The Teacher Assistance Tools: provide data on students' progress, suggesting ways to help students interact with the eXpresser.

### Impact

- ◇ The MiGen team gathered data from more than 300 hours of interaction by 11 to 14-year-olds at four secondary schools in England. The data showed that MiGen helped them become aware of a pattern, construct it and use it as a basis for building symbolic rules. Students were also able to exploit their experience of building patterns to express structural rules, rather than merely counting or spotting numerical patterns.
- ◇ After three or four lessons using MiGen, studies showed that students were able to apply their knowledge to conventional generalisation tasks.

## Improving teacher effectiveness in the classroom

### Intended educational aim or outcome

Improved effectiveness of teacher education leading to improved outcomes for pupils

### Context

The use of web based video technology to develop tools for collaboration, building communities of practice, self reflection, coaching and mentoring, for teachers in schools and colleges

### Technology used

Secure web based platforms, video cameras, analysis tools built into the system, ability to remotely control the camera, secure upload and download, secure log ins, teacher permissions, facility for in-ear coaching #IRIS Connect,

### Design features

It was reverse-engineered, based on research into the key interactions required for effective adult learning, the technology was designed to enable this

### Impact

Research by Prof Christina Preston (and others) has described:

- ◇ 94% of teachers consider using IRIS Connect has improved their teaching
- ◇ 88% consider their confidence has risen
- ◇ 96% feel they are willing to take more risks in their teaching
- ◇ 99% feel they are taking more responsibility for their teaching
- ◇ 85% consider there is more collaboration in the school
- ◇ 99% consider there are 'more conversations about teaching'
- ◇ 53% consider there is an observable and measurable improvement in pupil outcomes"

### Additional comments

The use of technology in order to improve teacher performance has often been overlooked. The key has to be that the system used is FULLY web based and not just the streaming of good practice show reels. Teachers need to be fully assured that they have full control of the video at ALL stages.



## Improving SEN students' ability to follow instructions

### Intended educational aim or outcome

- ◇ To improve speech intelligibility for all students to enhance level of listening and speaking skills, language development, on-task behaviour and the sharing of outcomes
- ◇ To improve teachers' ability to manage small group collaborative work, and undertake - for the first time - formative assessment of language skills at a distance and provide rapid re-direction where necessary.

### Context

Primary and secondary schools; small, medium, large and very large learning spaces with teachers working solo or team teaching, and with students working as a whole class or in small groups.

### Technology used

Redcat infrared classroom audio distribution systems (CATS), Flexcat FM CATS using up to six audio pods to support small group collaborative working.

### Design features

- ◇ Teachers and students trial the use of the technology and assess the impact on student learning behaviour, rate of progress, speed of student access to teacher support, the teacher's quality of formative assessment and student's ability to share ideas with the whole class.
- ◇ Teachers aim to maximise the use of available teaching space including areas outside the classroom.

### Impact

- ◇ Students recognise a significant improvement in their ability to hear and understand directions; when in group collaborative activity they remain on-task knowing the teacher can listen in at anytime; they can alert the teacher to needing input quickly without disturbing the class; they can give intelligible feedback to the whole class on progress made; their public speaking self-confidence improves.
- ◇ Teachers don't have to repeat instructions: they can monitor activity, intervene rapidly where necessary and undertake formative assessment of student contributions at distance, including those working outside the classroom; suffer less voice strain; provide higher quality feedback to students and more informed training to teaching assistants supporting SEN students.

### Additional comments

Extensive research shows that the SEN of many students is mis-diagnosed, with the child's inability to hear clearly what is being said causing behavioural problems and poor speech and language development.

## Peer feedback to improve critical reflection

### Intended educational aim or outcome

Peer feedback on collaborative projects

### Context

Secondary school computer science projects but the approach is known to work for any sector.

### Technology used

A tool called Scholar was used.

### Design features

Students wrote feedback for their peers on the projects they were developing using a rubric provided by the tutor).

### Impact

- ◇ The students were more rigorous and thoughtful in their own project development and writing. They wanted to avoid the comments they were giving to their peers. They took the work more seriously.
- ◇ This approach provides deep learning as the students build on a context of knowledge about the problem space from multiple perspectives.

### Additional comments

The peer feedback approach is very powerful when guided with a rubric. The students have their own experience to reflect on and they can use this to reflect on the work of others.

## Appendix 2: Case studies of effective use of learning technology (FE and Adult)

### Widening access to personal devices

#### Intended educational aim or outcome

Easier access to technology in standard, traditional classrooms, for research, simple document creation and possibly evidence gathering.

#### Context

FE, 16-19 and Adult Education

#### Technology used

Bring Your Own Device, Microsoft Surface Tablet, open WiFi

#### Design features

- ◇ To make technology easily available in traditional classroom situations where other technology was not already in place.
- ◇ 150 Portable tablet devices, robust, simple to operate."

#### Impact

- ◇ Teachers use of technology in the classroom increased.
- ◇ Teachers changed lesson planning to incorporate technology.
- ◇ Students benefited from easy access to research material.
- ◇ Students own skills and devices could be used.
- ◇ Tablet devices were not suitable for serious assignment or document creation as no keyboard/mouse and small screen size.
- ◇ WiFi bandwidth struggled to cope initially - upgrading required.
- ◇ students access to streaming media had to be monitored - WiFi management software needed to be installed.

#### Additional comments

Student feedback suggested there was a mix of those that were happy doing quite complex work on a tablet and those that wanted a PC. Increased use of cloud storage and cloud services generally by students and staff helped to move this project along as local storage is no longer suitable for efficient and flexible working. Students and staffs' familiarity with services such as OneDrive and Dropbox meant they could use their own device or the tablets and still access their work in college/at home etc.

## Flexible learning for adult students

### Intended educational aim or outcome

I wanted to offer real flexibility for students and really meet a wide range of needs e.g. lessons available during the night for shift workers, reinforce learning through several different mediums to meet range of learning preferences.

### Context

Adult learning for TAQA and ITT/ITE

### Technology used

Webinars using all the tools available, Skype & Webcams, Video/audio recordings, Moodle

### Design features

A blended learning approach but using webinars for real time teaching. These are recorded and made available to reinforce learning and/or be available for those who cannot attend the live sessions. Moodle contains self-directed lessons to reinforce learning from webinars or as an alternative. Podcasts reinforce learning and provide briefings for assessments. Video recordings of learner teaching/assessment practice can count as part of the assessment and learning, supporting learners to critically reflect on their own practice - a crucial skill for would be FE teachers/assessors. Offered as groups and 1:1 training

### Impact

- ◇ Learners become more confident using technology and start learning about digital literacies.
- ◇ They are able to develop critical reflection of both their own practice and others.
- ◇ Self-directed learning encourages collaboration through activities. Those that can and want to work on their own at their own pace can, with regular 1:1 contact with tutor to ensure they are ok.
- ◇ Those that need more support are provided with it as and when required through additional 1:1's.
- ◇ One impact for learners is if they miss a lesson due to workplace commitments, they do not have to rely on second hand learning from a colleague as a recording of each webinar is made available.

### Additional comments

Design and technology has been kept simple and technology has only been used where it was required to solve a problem not because it is there or is the latest trend. If it doesn't enhance the learning it doesn't get considered. With the onslaught of so much technology and it changing every day it is easy to get side tracked but I have kept the focus on what can the technology do for my teaching and my learners learning and development.

## Improving learning to weld

### Intended educational aim or outcome

Access to welding equipment is limited as it is high-risk whereas a simulation provides safe learning. The aim was to enable the college to introduce the engineering sector to 14-16 year olds.

### Context

FE, engineering, 14-16, 150 students per year

### Technology used

Welding simulation model, virtual haptic controls, viewing mask, screen projection

### Design features

- ◇ The simulation is an activity in student's own time and built into guided learning hours.
- ◇ It accounts for 4-6 weeks of welding previously done in the workshop, but reduces the cost of materials.
- ◇ The pedagogic value is that students learn from their mistakes, independently of the teacher, due to the quality of feedback from the model. It introduces an element of competition between students to see who is the best, and promotes the idea of self-improvement, and a "personal best". Apart from viewing through the mask, it is also projected to the wall so all other students can follow the progress of classmates and learn from each other's technique.

### Impact

- ◇ It has radically increased time spent practising welding.
- ◇ It has improved the social coherence of classes because of the 'games' attitude of students.
- ◇ Extends virtual training opportunities to employers, to address the lack of technical and practical engineering skills and further increase the engineering community.
- ◇ Reduces the College's carbon footprint by cutting back on waste and saving energy.
- ◇ Pass rates have improved on this element and the quality of work is better.
- ◇ No reduction in teacher hours.
- ◇ It is a huge enhancement in terms of learner time spent honing welding skills.
- ◇ No extra time requirements or costs."

### Additional comments

Cost of simulation is £50k from manufacturer that developed it.

## Collaborative learning via GoogleDoc

### **Intended educational aim or outcome**

To develop digital literacies through collaborative writing and project work

### **Context**

Further and higher education; learners aged 17+

### **Technology used**

- ◇ Google Docs as a dynamic, engaging and transferable tool
- ◇ Google Drive, cloud technologies, mobile devices, tablets, laptops, paperless

### **Design features**

Brings added dynamism to the learning/teaching process

- ◇ engages higher order thinking skills
- ◇ uses current, cloud-based technologies that students know about and already engage with
- ◇ gets students to collaboratively construct their knowledge

### **Impact**

The outcomes showed that the design

- ◇ gave students a sense of organization in a different way
- ◇ developed and practiced their digital literacy skills
- ◇ regularly engaged critical thinking and creative faculties
- ◇ allowed students to identify gaps and strengths in their knowledge, and the collaboration allowed them to co-construct knowledge together in a paper-free, transferable manner
- ◇ created digital artefacts for later access anywhere, anytime.

### **Additional comments**

You can view full details of this case study, which won an award here: <http://www.rsc-scotland.org/?p=4084>

## Personalised tutor feedback for independent learning

### **Intended educational aim or outcome**

To provide more effective and detailed feedback to learners to enable them to progress their learning. Learners were not engaging with written feedback and would seek support from teachers to make improvements needed and whilst verbal feedback was detailed they did not remember all that was said.

### **Context**

Further Education - vocational and A level

### **Technology used**

I-pad using camera, Explain everything app, Dropbox, Planet e-stream app and web version, Quicktime

### **Design features**

Teachers annotated and gave verbal feedback on learners' submitted work resulting in videos returned via private link to video server.

### **Impact**

- ◇ Improvements in quality of work, learners working independently, reduced workload for teachers
- ◇ Teachers loved it because it allowed for more detailed feedback and saved time over more traditional marking.
- ◇ Learners loved it because they were able to watch feedback a number of times and make improvements to their work.

## Improving sense of engagement and critical reflection

### Intended educational aim or outcome

To increase students' sense of engagement, and improve their skills of literacy and critical reflection

### Context

Further Education: Hair and Beauty, ICT, English and ESOL. 16-18+ years

### Technology used

Moodle and OU Blog.

### Design features

- ◇ Students are asked to use the blog to critically reflect on their progress throughout a course.
- ◇ Tutors are able to deliver homework and coursework using this tool.
- ◇ It had to be quick to load, easy to use, and able to be make a private journal.

### Impact

- ◇ For the first time students were able to create and upload their content and 'show off'. It created a sense of 'engagement'.
- ◇ Students were able to demonstrate learning to a wider audience.

### Additional comments

Blogs are a mainstay and have stood the test of time for many years. Enabling students to blog now develops spelling and grammar as well as the higher order skills of critical reflection and debate.



# Appendix 3: Case studies of effective use of learning technology (HE)

## Student-tutor communication beyond the classroom

### **Intended educational aim or outcome**

Enhancing the way students communicate with both their tutors and fellow students outside of the classroom is a key challenge.

### **Context**

Higher Education, 2nd and 3rd year modules.

### **Technology used**

Twitter

### **Design features**

- ◇ Students were offered the opportunity to voluntarily follow (and be followed by) the tutor, who would post additional links and be available for online discussion. Students could tweet with questions, etc.
- ◇ All tweets were also embedded in the VLE by way of Twitter Widget HTML embed code.
- ◇ Twitter is a useful tool as it is available on the web as well as through dedicated apps for smartphones and tablet devices.

### **Impact**

- ◇ All students who engaged with Twitter found the process beneficial. Interaction with the tutor increased around formative and summative assessment opportunities, and many other tweets were informal in nature.
- ◇ One of the key benefits was students could see their tutor was 'normal' by way of his tweets, which in turn made him more approachable. Students also communicated with other students via Twitter, and non-twitter users still accessed links posted by the tutor via the embedded widget.

### **Additional comments**

Twitter worked particularly well in this instance as the tutor is a regular user of the service. Therefore students could communicate quickly with the tutor during non-office hours.

## Ensuring student engagement

### Intended educational aim or outcome

Ensuring that students engage with their studies throughout the module.

### Context

University, all years.

### Technology used

Online assessment (machine marked assessments).

### Design features

- ◇ Some level of formal assessment. This is typically worth a small percentage of the overall module mark or contributing to a threshold value that has to be attained in the continuous assessment to pass the course. For the latter there is no direct contribution to the overall module mark and the module is marked purely on the exam.
- ◇ Multiple online tests spaced evenly through the module.
- ◇ Immediate feedback, usually on those tests that contribute to thresholds.
- ◇ Multiple tries if the student gets it wrong first time - for lower marks.

### Impact

- ◇ Assessment drives learning. So students focus on assessments and these assessments ensure the students have to engage.
- ◇ As expected those who do all the assessments and do well also do well on the exam.
- ◇ Completions are improved by having the formal assessment regime compared to simply using formative assessments.
- ◇ Proving that improved retention over a large module is directly related to our assessments is not so easy and we cannot make such claims.

### Additional comments

- ◇ Writing good quality online assessments takes time. Adding useful feedback and multiple tries adds to the load. But instant feedback to the student is powerful.
- ◇ Where there is a direct contribution to the module mark we demand that authors write multiple variations in their questions - so more work.
- ◇ Moving to the threshold approach where there is no direct contribution to the module mark enables us to
  - a) reuse the same questions year on year
  - b) not worry about plagiarism
  - c) let the student re-attempt the assessments multiple times until they get the required scores

## Keeping track of remote students

### **Intended educational aim or outcome**

To enable a team of 7 tutors to keep track of a group of 170 PG Cert Primary Education Students.

### **Context**

Higher Education sector, Education Department

### **Technology used**

PebblePad, Blackboard Learn, Panopto.

### **Design features**

Most of the design and testing went into the template and structure of the Portfolio that the students copied.

### **Impact**

- ◇ The portability of the Portfolio during and after the PGCert student completed the course.
- ◇ The tutors had more personal information and handle on each PGCert student.

### **Additional comments**

Just a really great example of using PebblePad Portfolios in a Higher Education department.

## Collaborative learning via show-and-tell

### **Intended educational aim or outcome**

To be able to design and critique effective pedagogic use of a technology, with reference to theoretical concepts

### **Context**

HE, Masters in Education and Technology

### **Technology used**

Moodle, ForumNG, Camtasia, Powerpoint, YouTube

### **Design features**

Each student contributes an account of their use of a technology in their teaching, and comments on two other presentations, with reference to pedagogic principles and concepts; they

- ◇ present or demonstrate the technology and the practice or activity that used it
- ◇ provide a url for other students to link to, AND/OR
- ◇ provide a slide sequence showing screencasts to give a sense of what the technology does
- ◇ describe the context in which the technology is used (age, type, level of student, subject, etc)
- ◇ discuss positive and negative issues arising from their evaluation

### **Impact**

- ◇ Impressive range of technologies showcased
- ◇ Lengthy but also appreciative critiques of each other's designs
- ◇ Students enjoyed discovering new technology tools and resources they had not heard of before
- ◇ It was the activity that most students rated most highly
- ◇ Many students reported that they would change their practice as a result

### **Additional comments**

I learned a lot as well

## Giving students instant formative feedback

### Intended educational aim or outcome

- ◇ To provide instant formative anonymous feedback in class during a campus-based teaching session to large groups of HE students
- ◇ This is also suitable for low-stake summative assessment with personal Voting system handsets.

### Context

Higher education, across curriculum areas including STEMM and non-STEMM with undergraduate and postgraduate students

### Technology used

Electronic Voting System handsets (EVS) and classroom response system

### Design features

- ◇ While EVSs are widely used in HE now for both individual and group working, we additionally designed an in-house online database linked to the student system and accessible via the LMS by the tutor.
- ◇ When we wanted to use the EVS for small tests or quizzes we then had the student IDs linked to their handset ID via a class participant list so their marks could be gathered and stored and were available back to the students within the hour.
- ◇ For use outside the standard classroom we purchased a handheld system response receiver so formative answers and results were once again easy to gather.

### Impact

- ◇ Student feedback has been very positive on the whole.
- ◇ They like the instant feedback in class and the opportunity to see via the feedback graphs and charts where they are in relation to others.
- ◇ Academics like the feed forward aspect where they know what the students have already understood and what needs more explanation and support

### Additional comments

Relates to various research papers on EVS/clickers by E. Mazur and colleagues; the ongoing work at the University of Hertfordshire and other places in the UK.

## Improving pass rates and reducing marking load

### Intended educational aim or outcome

To increase pass rates and reduce marking workload

### Context

Higher education sector - civil engineering degree, 1<sup>st</sup> year, fluid mechanics

### Technology used

- ◇ Online testing/grade centre on university learning resources website,
- ◇ Pre-set test with in-built marking system, students are given grades and tutor moderates marks.

### Design features

- ◇ Online testing at time to suit students; one of three tests per semester
- ◇ Select suitable questions based on syllabus and worked examples from class
- ◇ Set up marking system and range to allow for rounding
- ◇ Demonstrate in class to familiarise students with test
- ◇ Prepare dummy test for students to practise with software before doing actual test

### Impact

- ◇ Improved pass rates for test and for module overall (see paper below)
- ◇ Easier access to test, in particular for part-time students who do most of their work outside of university time
- ◇ Decrease in marking load

### Additional comments

See: <http://journals.heacademy.ac.uk/toc/ened/8/2>

## Appendix 4: Survey questions

The survey was conducted via Survey Monkey.

1. What are you contributing?
  - a) case study examples
  - b) ideas for future developments in Learning Technology
  - c) commentary or questions
2. Which ETAG topic is your contribution relevant to?
3. Which sector(s) are you based in?
4. Please rate the extent to which you agree that the following statements describe barriers to effective use of learning technology that you currently experience (strongly agree, agree, neutral, disagree, agree)
  - a) Lack of funding to purchase technology.
  - b) Lack of resource to provide release and support for staff to enable them to incorporate technology in their practices.
  - c) Funding methodologies that are inimical to technology supported learning e.g. focusing on classroom activity.
  - d) Lack of direction at a strategic level resulting in fragmentation of practice across provider curriculum areas and levels of work.
  - e) Reliance on individuals to champion innovation and exploitation of their willingness to support colleagues.
  - f) Lack of headroom for managers to support innovation and risk taking.
  - g) Lack of credit and recognition for innovative uses of technology by key influencers such as government agencies, awarding bodies, governing bodies.
  - h) Lack of guidance on what would constitute outstanding and good practice across the range of technology use.
  - i) There are few exemplar organisation policies on technology for learning and teaching.
  - j) Staff not encouraged to use technology so many focus on the mandated administrative processes (e.g. QA requirements, registers, outcomes, summative assessment).
  - k) Little recognition that learning technologies are diverging between central sensitive data for administration, and independent and collaborative use by teachers and learners.
  - l) Focus on omission and error in inspection and QA, which does not encourage experimentation and exploration of the potential of technology.
5. Your case study details
  - a) What was the intended learning outcome, or problem to be solved, or benefit for students (up to 30 words)?
  - b) What was the context, e.g. education sector, curriculum area, age or level, etc. (up to 30 words)?
  - c) What type of technology tool(s) or resource(s) were involved? Please list, with commas between
  - d) What were the key elements of the design (up to 100 words)?
  - e) What were the main impacts (up to 100 words)?
  - f) Any additional comment?
6. Are you a member of ALT?



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