

ASSOCIATION
FOR LEARNING
TECHNOLOGY



Evidence-based policy development in Learning Technology


REPRESENTING THE UK TECHNOLOGY INDUSTRY

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0. Introduction

On 9th Jan 2012, the Association for Learning Technology (ALT), the ESRC/EPSRC funded Technology Enhanced Learning programme (TEL) and Intellect (the UK trade association of the technology sector) held an invited event in London to discuss the issue of the title. Those taking in part included policy makers, technologists and researchers¹.

The meeting was chaired by John Cook, Professor of Technology Enhanced Learning and Chair of ALT's Research Committee. It was addressed by Jonathan Shepherd, Professor of Oral and Maxillofacial surgery at the University of Cardiff; and Director of the Violence Research Group. A response followed from John Naughton, Vice-President of Wolfson College, Cambridge, Emeritus Professor of the Public Understanding of Technology at the Open University; and the Observer's technology columnist. This was followed by group discussion and reporting back and final comments from the two principals.

A list of attendees is appended to this document.

The aims of the day included sharing ideas on how to get more evidence-based policy making in Learning Technology, possibly drawing on parallels with medicine and policing where Professor Shepherd and colleagues have persuaded authorities to look at medical evidence in tackling crime leading to the University Police Science Institute in Wales.

A further aim was the production of a checklist that Learning Technology Researchers (LTRs) should bear in mind when designing and conducting their research so as to give their work more chance of influencing policy and, as a result or otherwise, leading to greater uptake and hence impact. The breakout groups were asked to focus especially on this aim. The resulting checklist is given as the last section of this report proper, before the Appendix.

The report has six further sections covering:

1. Key points from the presentations of the two principal speakers
2. Models for evidence-based LT research
3. Methodologies for evidence-based LT research
4. Professional development of Teachers and LTRs
5. Conclusion
6. The LTR checklist

Except in respect of Section 1 (which is based closely on the points made by the principal speakers), the reports – earlier versions of which were made available to participants for comment – seeks to reflect the main points of the discussion that took place, rather than to represent either a formally agreed consensus or an overall accepted view amongst those who took part. Responsibility for the contents of the report rests with ALT.

¹ ALT and Intellect were able to plan and organise the event as a result of some initial funding from The Department of Business, Innovation and Skills (BIS) which is keen to encourage evidence-based policy-making in relation to the use of learning technology.

1. Key points of the presentations of the principal speakers

Jonathan Shepherd argued for scientific method and associated research to be more widely applied across the spectrum of public services, for example in education, offender rehabilitation, policing, victim services, welfare reform and crime analysis. He argued specifically for randomised trials being used in a more widespread and systematic fashion across public sector research.

Often there were objections to such work because of ethical and political problems which the objectors claimed were greater in offending and education than in health areas such as illness, injury and death. In practice there is a lot of trialling that can be done in many areas. Trials can be of structures, arguments and actions.

There was also a need to transfer learning and research techniques from one area to another. A good example was the advantages of crime research and policing applying the medical school model which integrates research, NHS services and student/practitioner education. This had led to the establishment of the University Police Science Institute in Wales and strong links between policing and the Violence and Society Research Group at Cardiff.

He discussed, with solid examples and illustrations, the strengths of the Medical School model. These include:

- well established in major research-intensive institutions
- integrates research with health services
- able to undertake longer term work/trials
- many academics, and all medical school heads are active researcher-practitioners
- education and training and NHS services are constantly adjusted in the light of new research evidence
- communities that produce, distribute and apply evidence
- research agenda continuously informed by day-to-day clinical problems
- strong links with the relevant research council(s) and industry
- a culture of scientific enquiry and support to conduct it
- a routine “waterfall” evidence cycle (produce, interpret, draw into guidelines, distribute and implement (by practitioners and NHS managers), evaluate, recourse)

He noted that there were few equivalents for other public services. There were few trials units. Some funding policies had little emphasis on research of value to the public sector. Potentially much more could be done in the areas of crime, offender management, and many others including education. Research councils had a role to play, as do the other parts of government that are responsible for R&D. UK professional organisations such as school teaching, police and probation professional bodies also need to provide leadership in this area as part of their major, standard setting roles.

One of the attractions of having a large evidence base was that it had been possible to establish NICE (National Institute for Health and Clinical Excellence), which used the evidence from trials to make informed decisions that affected the public. The Ministry of Justice had postulated an

equivalent in its area but it needed an expanded evidence base that was widely accepted. Political doctrinal beliefs could make evidence-based decision making problematic in some areas.

John Naughton supported the thrust of the argument and suggested that part of the source of the problem was the mistaken belief that in order to be respectable, social science research required “paradigms”. There was still in many disciplines a strong negative correlation between academic status and relevance to the real world.

“Normal” science came in two phases. The first is based on exploring ideas and concepts. The second is about making the better ones work in the field. He discussed the concept of the “pathological paradigm” - a false underpinning which was common (and sometimes political) - and gave some examples.

He argued that perhaps an engineering approach was a better description than a scientific one. Engineers emphasised the second phase more strongly than the first and their evidence base was more likely to be built on trials and tests rather than paradigms. A key area was that of knowing what constituted real evidence. Engineers also knew about how to make their work have value in the longer term (future proofing).

He suggested that a good example of policy making without an evidence base was that of copyright. Here it seemed that an evidence base had been developed in the Hargreaves report but was then largely set aside. As a result, it could be argued that the publishing industry had been able to slow down progress in the UK, both of technology itself and also of work that depended on cost effective, open dissemination of knowledge.

2. Models for evidence-based LT research

There was some discussion about whether the medical school model was appropriate for education and especially why researchers were rarely practitioners.

Teaching and medicine are similar in that they each require elements of art, craft and science. However there is a huge difference in the financial incentives - for example in pharmaceutical R&D. Effective medicines can generate significant profits. Improperly produced medicines can cause harm to patients and lead to large fines and/or lawsuits. As a result the status and salary expectations of medical academic-practitioners are much higher than in education.

Nursing and agriculture may offer better analogies for education. Not all nursing academics are practicing nurses and the same is true of agriculture. As with education, academic salaries and practitioner salaries are less far apart than in medicine.

By contrast, British Army education officers are all expected to have an appropriate degree and a PGCE (FE) and undertake CPD. They are also practicing soldiers who are expected to undertake tours of duty from time to time as well as meeting military standards (such as fitness) and undertaking military CPD.

There was one suggestion that mental health might also turn out to be a better model for education research as it had many characteristics (such as uncertainty and relationship to the mind/well being) and methodologies in common.

In the current model for education, research workers were more interested in completing a piece of work, writing it up and moving on rather than in implementation. Academics were understandably more interested in future-proofing than future-proofing and, although impact was now part of the evaluation in the Research Excellence Framework (REF), the effect was yet to be fully worked out.

One group felt that the way to get more valuable data was through the practitioner-researcher (that way round). Teachers at all levels were essentially manufacturers and engineers - they make things and evaluate their effectiveness and try to make them reusable. But this process could be made more systematic. Practitioners could work with one another to construct evidence bases, especially if working with researchers who might take on the coordination and analysis role. It also was necessary for the researchers to be practitioners for at least some of the time - this was easy for those researchers working in Higher Education but less so for others.

In line with this idea, one group explored in detail how an equivalent of a medical school could work for education research. It would need to have a hub around which researchers and practitioners worked. An "education school" would be distributed but would be a proper entity with appropriate governance, more like some of the shared health schools that arose following the broadening of the teaching base in the 1990s.

It would have involvement from all the stakeholder groups (including teachers, learners, parents/guardians, industry, researchers, school governors, administrators, government etc.). It would provide mechanisms for "researchers to invade places of learning". It would help bring practitioners, researchers and policy makers together (now there is an idea :-)).

There was also a need for a campaign to promote the more central and systematic approach to using and evaluating LT. That campaign needed a focus and leadership. It needed to be aware of public sector drivers and issues more widely. However, while one was not exactly pushing against an open door, at this time it seemed that the door is at least known to move and may have recently had some political oil applied to its hinges.

3. Methodologies for evidence-based LT research

Some of the attendees questioned whether it was possible to evaluate the outcomes of successful technology enhanced learning. The outcomes of education extend beyond examination results and timescales extend beyond the period at school. Learning was also context dependent and there was an issue of the currency of the results of any research.

It was also argued that one cannot hold variables constant in the same way as one can in science and health. It was not clear what a control group would do in a large scale education experiment and whether this were indeed possible as teachers would find it hard to stand dispassionately back from that group and teacher attitudes affect results.

Defining precisely what an intervention was often caused problems as it was very hard to screen out other factors. Most education experiments gave merely "existence proof" results - they showed only that there were instances of success (and occasionally failure) if a combination of things was done, with little ability to generalise. The absence of large scale data capable of being mined effectively (with the exception of large scale assessments which are largely rubbish by practitioners and researchers) appeared to be endemic in learning and especially LT. One group developed an

example based on the efficacy of a mosquito net in preventing malaria - there is so much else one has to get right in the conditions of its use to reach sensible conclusions about whether it works.

Action research is important but needed to be viewed in context as again it represented an existence proof approach. However, "a good story never did a case any harm". So, good action research could be used in that way, but it is important to reinforce results by the use of as many methodologies as possible, both quantitative and qualitative. Effective dissemination is also important.

Another thing that often seemed to some to stand in the way of evidence-based work was the role of the tabloid press in the UK. Having strong political views, tabloids seemed to many to be well placed to denigrate any evidence base and thereby make rational debate about many things difficult or impossible. Education was a favourite area. It was important that schools were offered advice in how to handle such areas when presenting results. It was also noted that teachers did not enjoy the status with the press that doctors did.

4. Professional development of teachers and of LTRs

The meeting was held at the same time as a report that only 3 of England's teachers undergoing initial teacher training had first degrees in Computer Science, together with speeches and press releases about the National Curriculum and teaching Computer Science and ICT. It seemed from some reports as if "everyone" had agreed that current teaching of ICT was "boring" but it was not clear on what evidence that finding was made. Nevertheless, the community and public seemed to have readily accepted the premise.

It was agreed by most that Initial Teacher Training (ITT) was the most crucial piece of professional development for teachers. There was felt to be a lag between learners and teachers (and a further one between teachers and teachers of teachers) about the importance of LT in teaching. Without more early understanding of LT by those teaching teachers at all levels, this lag will continue. This is an area where perhaps all academics should be strongly encouraged to be practitioners - in the way that doctor-trainers are also practicing doctors.

Ongoing CPD was also essential as technology and pedagogy advanced. It was important that schools/institutions should not become isolated in this area. Technology enhanced learning was like motorways - it is here to stay. CPD needed to be systematic and recurring (as it is in HE?). LT could be presented as a set of tools/mechanisms to help the creative teacher make the things that were needed to support effective learning - again the engineering/manufacturing nature of teaching was stressed.

Part of the ITT/CPD should be a substantial set of case studies and teaching should perhaps follow a Harvard Business School model. However keeping case studies current and relevant was a large job that perhaps pointed to sharing and the distributed school model again.

There was a potential problem in that it seemed that many entering education at all levels were partially motivated by the wish to be independent. Thus sharing and accepting others' resources could still be problematic for some. This might be overcome through selection and staff development.

5. Conclusions

Compared to medicine and policing, it is perhaps more challenging to produce definitive evidence on technology's specific role in supporting education and training. However, despite the inherent challenges, there are principles and practices that education researchers can follow to ensure that their work has an impact on policy and practice.

The checklist that follows in the next section is intended to serve as an initial guide for education researchers in general and LTRs specifically. We welcome your feedback in developing these principles further in the future.

In addition to the points suggested for the LTR checklist, a consensus began to emerge that an information hub (or "education school") model for evidence in the area would be valuable. One function of the hub would be to develop and maintain a bank of trusted results for practitioners to use as they think fit. The hub would be run by an independent body, but would draw on the work of and bring together practitioners and researchers, and it would systematically collect and evaluate practice-led evidence from teachers, learners, parents and family, industry, government and others. It was felt that over time this would help to ensure that education technology policy and practice becomes more informed by the evidence. In order for this to work the body would need to have a legal status and be long term.

6. LTR checklist

Research methodology

1. Consider mechanisms for speeding up discovery, innovation, dissemination and adoption.
2. Combine aspects of qualitative (e.g. action research) and quantitative research (e.g. randomised trials) rather than using just one methodology. Action research outcomes (and case studies in particular) can be persuasive to policy makers if insufficient for others.
3. Consider interdisciplinary aspects.
4. Consider properly prepared, conducted and analysed longitudinal studies.
5. Build on informal learning in your strategy for getting learner involvement.
6. Have as disinterested an evaluation strategy as far as possible involving learners, supporters and teachers.
7. Acquire and capture a detailed understanding of how the outcomes were arrived at.
8. Be systematic in presenting evidence and remember that your final audience is the public.
9. Support effective implementation in the field by staying close to practice in your work - your project does not end when you publish the paper.

Real-world applicability

10. Fully consider interoperability challenges.
11. Think through and articulate the cost benefit model of anything that you propose for adoption.
12. Be specific about the technology needs and consider how these will change with time (future proofing).
13. Be specific about the precise nature of the intervention that you are proposing as a part of adoption and specify limitations of applicability of your work carefully.
14. Be prepared to re-analyse and re-work as a result of further evidence and be prepared to be responsible for your research if it fails to be replicated or receives poor feedback.

People

15. Involve supporters (learners, parents, family etc.) in shaping your work including, but not restricted to, in evaluation.
16. Involve teachers more - the use of practitioner researchers can be the best way of collecting evidence. The role of the academic is then that of project management and involves collecting, collating and analysing results. Teachers also need to be involved in feedback and evaluation.
17. Work with the learners closely being aware of their characteristics.

You

18. Be prepared to work with others in an “egoless” fashion.
19. Be a practitioner and keep your practice up to date
20. Keep up to date with the research of others.

Appendix: Attendees on 9th Jan 2012

Bob Butcher	Lead of Analytical team supporting FE and Skills, BIS
John Cook	Professor of Technology Enhanced Learning, London Metropolitan University; Chair of ALT Research Committee
Stuart Edwards	Deputy Director, Teaching and Learning Quality and Curriculum, BIS
Caroline Greves	Events Manager, ALT
Richard Hadfield	Managing Director, Hadfield Consultants Ltd.
Nicola Herbertson	CEO and founder, Hao2.eu
Sophie Higgins	Intellect
John Hoggard	Head of government and education, Intellect
Sheila Kearney	Head of Research, LSIS
Diana Laurillard	Professor of Learning with Digital Technologies, Institute of Education
David Ley	Senior Policy Advisor, DfE
Timothy Marlow	Expert for Education Sector, Steria Ltd.
John McLaughlin	Lead, policy on the use of LT and other ICTs in FE and HE, BIS
Dick Moore	Director and Owner, Moore Answers
Michael Munn	Director, UK and Ireland Education Business, Apple
John Naughton	Vice-President of Wolfson College, University of Cambridge; The Observer's technology columnist
Richard Noss	Co-director of London Knowledge Lab, Institute of Education
Martin Oliver	Reader in ICT in Education, Institute of Education; Chair ALT
Sarah Porter	Head of Innovation, JISC
Seb Schmoller	Chief Executive, ALT
Jonathan Shepherd	Professor of Oral and Maxillofacial surgery, University of Cardiff; Director of the Violence Research Group
John Slater	Director of Development, ALT
Josie Taylor	Director, Institute of Educational Technology, Open University.
Julia Von Klonowski	Education specialist/Engagement manager, Oracle
Jane Williams	Independent Advisor