Defining Effectiveness in Technology-Enhanced Learning and Teaching Practice – an initial exploration

Abstract

This research project focused on defining effective practice in technology-enhanced learning (TEL). In a focus group and interviews two research questions were explored: What is effective use of learning technologies? and; How do you know the use of learning technologies is or was effective?

An initial literature review was used to triangulate the results of the focus group and interviews.

The key findings include a number of themes such as, effectiveness in technology-enhanced learning and teaching which relate to systems, processes, support and learning design such as ease of use and accessible content design; learning and teaching specific aspects such as student-centred approaches, formal and informal learning opportunities and meeting student expectations.

Effectiveness can be evaluated and measured through system data (student tracking), data-based evaluations (questionnaires), improvements in performance and satisfaction (grades, retention) as well as by informal feedback (student motivation, meeting expectations).

In future it is hoped that the outcomes of this research will inform the identification and sharing of effective TEL practice and criteria for the review of online teaching / learning facilitation.

Keywords

effectiveness, impact, technology-enhanced

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Introduction
As an institution, Anglia Ruskin University has ambitious plans to embed learning technologies and in particular the in-house development of a Virtual Learning Environment (VLE) in learning, teaching and assessment. However this poses a challenge to move from a predominantly instructivist, teacher-centred and passive use of the VLE to a more interactive, student-centred one. Anglia Ruskin has taken the approach that every module has a VLE space and there is an expectation on staff to make effective use of the VLE to enhance students’ learning experience. These expectations and objectives are expressed in the Corporate Plan 2012-14 (Anglia Ruskin, 2012a), the Learning, Teaching and Assessment Strategy 2011-14 (Anglia Ruskin, 2011b) as well as the various Student Charters (Anglia Ruskin, 2012a-c). In the Teaching and Assessment Strategy 2011-14, for example, it states that,

‘We will… Use our VLE to support and enhance the student learning experience and make it integral to the course design and delivery... Our VLE will become a valued and essential tool for students in their campus and online learning experience’ (Anglia Ruskin, 2011b, p.12)

As part of this project, I considered what effective practice in TEL means and generated a number of themes or criteria in order to identify and evaluate effective TEL practice.

Conceptual Framework
The aim of this project was to elicit a definition of effectiveness in technology-enhanced learning (TEL). However I recognised that the application of learning technologies in learning, teaching and assessment does not exist in isolation – in fact it is often considered as a subset of learning, teaching and assessment rather than as an entity of its own.

‘Our primary focus on the enhancement of learning and teaching drives our approach. Technology can support this enhancement goal, and is therefore a factor in development of effective learning, teaching and assessment strategies. Innovative developments in technology will only be relevant if the enhancement of learning and teaching is the core purpose’ (HEFCE, 2009, p.8)

As such the use of learning technologies should be ubiquitous and an integral part of the learning experience, so seamlessly embedded that it becomes almost invisible. Therefore distinguishing between the effectiveness of learning, teaching (LT) and assessment and the contribution to the effectiveness of the use of learning technologies may be difficult.

Two perspectives can be tested:

a) Is the effective use of learning technologies the same or a subset of effective learning, teaching and assessment practices?

b) Can any aspects of effectiveness be identified which are particular to learning technologies and are not a subset of effective learning, teaching and assessment practices?

Figure 1: a) Learning technologies embedded in learning, teaching and assessment practice; b) Learning technologies embedded and distinctive
It is clear that if the first question is answered positively, it excludes effectiveness which is distinctive to learning technologies and negates the second question.

Perspectives and definitions of effectiveness may also differ depending on who one asks. It was therefore important to capture a variety of views in the focus group and interviews I conducted for this project. There are two ‘sampling frames’ (Wallimann, 2011, p.94) from which the samples were drawn. The sampling frame for the focus group was all stakeholders or the ‘population’ with a student-facing capacity while the second sample for the interview was drawn from the two groups leading on supporting learning technologies in learning, teaching and assessment, namely the Faculty Learning Technologists and Directors of Learning and Teaching or equivalent.

Furthermore the use of learning technologies also depends on the teaching approaches most prevalent in a particular educational context. Watkins et al. (2002) differentiate between different learning and teaching processes (Do, Review, Learn and Apply) based on Kolb’s learning cycle. According to Watkins et al. teaching activities are composed of the following elements: social structure, role, time and pacing, resources and tasks all centring around goals. ‘However different patterns of teaching activities display different conceptions of learning’ (Watkins et al., 2002, p.3) as illustrated below:

![Diagram of Teaching Activities](image)

While Watkins et al. focused on learning and teaching in schools, similar models apply to higher education with the exception that tools (synchronous and asynchronous collaborative tools) which are associated with more student-centred approaches still have a lower adoption (Walker et al., 2012, pp.34-37). However, best practice examples from JISC (2005, 2009, 2011, 2012) and UCISA (2011) tend to support constructivist and co-constructivist or learner-centred approaches. Therefore there is a tension between the prevalent, mainly instructivist, approaches to learning and teaching in higher education and what is seen as best practice.

Literature Review

The aim of the literature review was to collate and evaluate existing research to identify and define criteria for effective LT practice in order to compare and triangulate results from my institutional study. The literature review in this case mainly addressed the first research question, ‘What is effective use of learning technologies?’

While there are plenty of examples and case studies for effective and best practice in TEL (e.g. JISC 2005, 2009, 2011, 2012; and UCISA, 2011), finding criteria on which these examples were selected is more difficult. JISC (2012) defines a number of benefits technology can offer which are contributing to the effective pedagogic use of learning technologies, including improved access, up-to-date information, different forms of communication, responding to learners’ needs including flexible learning and better support as well as improved assessment and feedback.

In JISC’s *Emerging Practice in a Digital Age* (JISC, 2011), further criteria can be found including personalisation, flexibility of delivery and access, more opportunities for collaboration for students but also amongst teachers and institutions (e.g. developing and using open educational resources). It also mentions employability and digital literacy skills as opportunities technology provides. JISC suggests that higher education institutions (HEIs) should make use of these opportunities to become more competitive and to respond to changing student expectations as reported in the National Union of Students report (NUS, 2010).
Other authors (Bingham and Waite, 2008; Brown et al., 2010; Laurillard, 2010; University of Staffordshire, 2011; University of New South Wales, 2004) also emphasise flexibility, improved access and collaborative, interactive and student-centred learning.

Chickering and Gamson's (1987) *Seven Principles for Good Practice in Undergraduate Education* has been a frequently adopted approach to good practice in online education first by Chickering and Ehrmann (1996) and followed by many others (c.f. Bangert, 2004; Chizmar and Williams, 1998; Ritter and Lemke, 2000; UNSW, 2004). The seven principles for online education are:

1. ‘Encourages contacts between students and faculty [academic staff].
2. Develops reciprocity and cooperation among students.
3. Uses active learning techniques.
5. Emphasises time on task.
6. Communicates high expectations.
7. Respects diverse talents and ways of learning.’
   (Chickering and Gamson, 1987)

The literature review confirms the diversity of criteria for best practice which varies according to the learning and teaching context and the perspective of organisations. Therefore, rather than having fixed definitions of ‘effective’ or ‘best’ TEL practice, Edge and Richards suggest:

‘We thus see the essence of good teaching to lie in its continually emergent nature: never completely formalised or normalised, always responding to another cycle of action and observation, reflection, planning, and further action, through which the very nature of practice is theorised’ (Edge and Richards, 1998, p.572)

From the literature review it became clear, that while there are some aspects of effectiveness that are specific to TEL such as ease of access and flexibility most criteria are also derived from, and apply to, classroom-based teaching.

**Research Question**

Within the limited scope of the project, I narrowed the focus to two related research questions:

- What is effective use of learning technologies?
- How do you know that the use of learning technologies is or was effective?

**Research Design – Methods and Findings**

**Methodology**

The project mainly used a qualitative research approach as eliciting the criteria that may define the effectiveness of TEL involves users’ perceptions, opinions and perspectives. The project used the following research methods in the following sequence:

<table>
<thead>
<tr>
<th>Order</th>
<th>Research Methods</th>
<th>Rationale for this method</th>
<th>Research questions addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Focus Group</td>
<td>Representative sample group from across the university representing different stakeholders</td>
<td>Both questions were asked</td>
</tr>
<tr>
<td>2</td>
<td>Interviews</td>
<td>Representative sample of the two groups that support the use of LT</td>
<td>Both questions explored in detail</td>
</tr>
</tbody>
</table>

Table 1: Research Methods

The literature review was used to collate and evaluate existing research to identify and define criteria for effective LT practice and to be able to compare and triangulate results of the focus group and interviews.
Methods
Focus Group
The focus group was organised as part of a workshop on TEL at Anglia Ruskin’s Learning and Teaching Conference (25 June 2012). The participant sample (n=20 plus three facilitators and a conference blogger) was based on self-selection (workshop booking) but provided a good cross-section of the university’s population including academic staff from different disciplines, staff from different support units including student-facing ones, as well as student representatives (Students’ Union). The participants were divided into five (focus) groups (ca. 3-5 participants) of which three had a note taker.

All groups were asked to discuss the two research questions in sequence and make notes on a flipchart which I collected at the end. I then collated the notes from the flipcharts and note takers and grouped them thematically in a grid.

Interviews
The purpose of the interviews was to be able to explore the two research questions beyond the data received from the literature review and focus group.

The interviews took place between 5 and 20 July 2012 and lasted around one hour each. The interviews were audio recorded and I took notes as well. While the interview was structured by the two questions, it was conducted more as an unstructured interview ‘where the interviewer has a general area of interest and concern but lets the conversation develop within this area’ (Robson, 2011, p.280).

Findings
Focus Group
The focus group findings confirmed the themes identified in the literature review but also reflected the specific institutional context (e.g. widening participation, accessibility, inclusivity, usability, digital literacy) and customer orientation (i.e. well developed support as well as ICT infrastructure and processes). While there were many comments about what effective TEL is, the second question about identifying criteria or measurements for effectiveness received much fewer responses with less consistency. This indicates that there is still a need to identify what constitutes effective LT practice (criteria) and how effectiveness is measured.

Interview
The themes that emerged from the interviews corresponded to and extended those from the focus group especially regarding the first research question. In the interviews there were more opportunities to explore the second research question further which resulted in identifying means to measure and evaluate the effectiveness of technology-enhanced learning or its impact. These included system data (student tracking) and data-based feedback (e.g. questionnaires), outcome-based measures such as grades, skills and retention as well as more tentative information such as student motivation and satisfaction through informal feedback. Regarding enhancing learning a more student-centred approach and scaffolding the learning process was felt to be important which could be evidenced through student satisfaction and meeting student expectations. Finally, in some cases TEL could lead to measurable efficiency gains for staff for instance by freeing up time for more scholarly work and research. Though not necessarily an answer to the research question, it was also emphasised that there are a number of preconditions that can make a difference regarding the effectiveness of technology-enhanced learning such as ensuring that students know how to use the technologies, students and (new) staff are well supported in the use of technologies, tutors have experienced technologies as a learner and have adequate IT skills to make the best use of the technologies.

Synthesis of Findings
The focus group and the interviews resulted in similar themes and criteria for effective practice and how effectiveness can be measured or its impact identified. They also reflected different perspectives prevalent in different groups at Anglia Ruskin.

In summary, the use of learning technologies is effective when learning technologies

- are accessible, reliable and easy to use and both learners and staff know how to use them to their fullest capacity;
- enable more flexible and inclusive learning and thus a better life-work-study balance;
• provide a one-stop-shop to learning and support;
• encourage and enable more learner engagement, interactivity and ownership;
• are an integrated part of learning, teaching and assessment;
• support formal as well as informal learning;
• meet student expectations;
• use media to enhance learning for a wide spectrum of learner types and abilities;
• foster digital literacy, employability and lifelong learning skills;
• improve feedback and communication;
• create new opportunities for assessments for learning;
• scaffold and support the learning process;
• improve learner performance and / or satisfaction;
• lead to more efficient learning, teaching and related administrative processes.

Participants, especially in the interviews, identified the following means to measure and evaluate the effectiveness of TEL or its impact:

• system data such as learner logs or tracking;
• module evaluation and other formal student feedback;
• informal staff and student feedback;
• improved retention figures;
• student performance such as grades;
• improvements in students' digital literacy, employability and lifelong learning skills;
• teacher motivation and passion;
• student motivation and preparedness for lessons;
• more time for staff through efficiency gains for such activities as scholarly work and research.

Overall the findings of the focus group and interviews align with those from the literature review. They are also specific to Anglia Ruskin's context as well as the agendas of participants in this research.

The references to media in the findings reflect recent developments of improved media provision (i.e. personal and lecture capture, media server, iTunes U) but also the media background of two of the interviewees. A final factor that was highlighted is the strong desire to get higher efficiencies from improved processes. As the VLE is developed in-house there is also a lot of pressure to develop and integrate technologies that support the enhancement of assessment, feedback, communication and collaboration and more learner-centred learning, teaching and assessment. This is both an opportunity and a challenge.

Conclusion and Outlook
The research as part of this project was a limited pilot study which would benefit from expanding to include more interviews to validate or extend the set of criteria for effective technology-enhanced learning found so far. The results will inform the identification, capturing and sharing of effective TEL practice and the teaching review process.

References


