2nd Edition
Revised and Updated

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Summary

Research literature is only beginning to emerge relating to the benefits of VLEs on teaching and learning in schools in the UK, as the market for VLEs is still developing. But by drawing on the more extensive evidence from further and higher education, where the use of VLEs is more advanced, it is possible to identify potential benefits and issues for schools.

Key benefits
- Enhanced teaching and learning
- Flexible access for students, in a protected environment
- Potential to extend the reach of education beyond the classroom
- Greater parental involvement

Teachers can maximise the impact of VLEs by ensuring that they:
- use VLEs to support departmental planning and administration
- collaborate and share resources with other teachers
- invest time in training so they become confident users and learn new skills.

What the research says about Virtual Learning Environments in teaching and learning

This report is based on an analysis of current research about the use of Virtual Learning Environments (VLEs) in teaching and learning. It summarises the key findings and suggests resources for further reading.

What is a Virtual Learning Environment?

There is some confusion about the definition, functions and role of VLEs used in the research literature. There are two terms currently being used when referring to ICT environments designed to aid the management of the learning process: VLEs (Virtual Learning Environments) and MLEs (Managed Learning Environments).

A VLE is a software tool which brings together in an integrated environment, a range of resources that enable learners and staff to interact online, and includes content delivery and tracking.

An MLE brings together two distinct strands – a VLE and a management information system (MIS) and has the potential to fully integrate learning materials, pupil data and assessment (MLE = VLE + MIS).

Although there is some confusion about the definition of VLEs, they are generally a combination of some or all of the following features:
- Communication tools such as email, bulletin boards and chat rooms
- Collaboration tools such as online forums, intranets, electronic diaries and calendars
- Tools to create online content and courses
- Online assessment and marking
- Integration with school management information systems
- Controlled access to curriculum resources
- Student access to content and communications beyond the school.

But to judge whether VLEs have the potential to enhance teaching and learning it is necessary to examine the available research evidence.

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ICT Research

Key Research Evidence about VLEs in Teaching and Learning

Although VLEs are still relatively new to the schools market, the general impression is that they are likely to have a significant impact on the process of teaching and learning in the future. A JISC Assist workshop report suggests that without an MLE, a university is not sustainable far into the 21st century (JISC, 2000).

While most of the academic literature is from further and higher education, in many cases there is potential applicability to the school sector. There are references for further reading supplied alongside most of the findings.

General benefits

- Staff and students can find it easier to use ICT within an integrated environment
- Software has a consistent look and feel across the whole organisation
- Communication channels are increased through email, discussion groups and chat rooms.

About Becta's 'What the Research Says…' series

This series of briefing papers is designed in particular for teachers, ICT co-ordinators and school managers, in order to provide an initial idea of the available research evidence for the use of Information and Communications Technology (ICT) in schools and colleges. We welcome feedback and suggestions for further titles in the series (contact details can be found at the end of this briefing).

Benefits for students

- Flexibility of 'anytime, anywhere' access (Jacobsen and Kremer, 2000)
- There can be learning gains in ICT, writing, understanding and presentation skills (Watts and Lloyd, 2000)
- Improved motivation and engagement (Watts and Lloyd, 2000; Wilson and Whitelock, 1997)
- Development of higher level learning styles (Gibbs, 1999)
- New approaches to learning through online discussion forums (Gibbs, 1999).

Benefits for teachers

- Increased self-study by student teachers willing to make the commitment to the technology and to sharing personal views and experiences (Russell, 2000)
- Passive student teachers are encouraged to contribute more effectively (Tanner and Jones, 2000)
- Student teachers using online seminars can increase their participation and performance (Pilkington et al., 2000)
- Improved confidence in student teachers and enhanced practice and collaboration (Selinger, 1997).

Benefits for parents

- Parents are more likely to be engaged in the school community
- Parents can monitor their child's progress more easily
- Access to online content supports homework studies out of school hours.

Factors for effective use

- Teachers need to evaluate VLEs from an educational perspective to determine whether the new technology can be embedded into the teaching and learning of their institution (Britain and Liber, 2000)
- Teachers need to learn new skills to moderate online discussions, create online content and develop online tutoring techniques (Kyriakidou, 1999; Monteith and Smith, 2001)
- Common standards are essential for transferring data and content easily between systems within an institution and between sectors (JISC, 2000)
- Support staff such as librarians need to be involved in the development of VLEs in partnership with course tutors (MacColl, 2001)
- Training for all staff and reliable technical support are crucial.

VLEs in practice – a case study

A comprehensive Technology College of 1,600 pupils in Kent, serving a wide range of pupils, uses a Managed Learning Environment (MLE), which provides a number of services, including a VLE.

The VLE feature allows teachers to create curriculum content, access resources, plan their lessons, set and mark assignments and manage lessons both offline and online. Students can be set work according to their individual abilities and needs, and can access the network from home as well as in college. A significant proportion of students (80%+) have internet access at home and a growing number have broadband.

Teachers, pupils and parents report a range of benefits from using the VLE:

- Students develop independent learning skills and have more control over how and when they work
- Absent or excluded students can continue their learning from home, with work set by the teacher on the VLE, and marked and returned within the VLE

- Students find the work "easier and quicker to do", despite the fact it is the same work they previously did with pen and paper
- Students like the fact that they can't forget to bring their work in, or lose it
- Teachers can save time in the longer term by creating content and sharing lesson plans
- Teachers can track students' results and reduce the amount of marking they have to do
- Parents can participate in their child's learning and have another way of keeping in touch with the school.

The full version of this case study is available on the E-Learning Foundation website [http://www.e-learningfoundation.com].

Explanation of findings

Despite the relative sparseness of research evidence relating to schools, it is believed that VLEs will have a significant impact on the process of teaching and learning in the future. The positive benefits emerging from the use of VLEs in further and higher education have potential applicability to the school sector.

Uses of a VLE in a secondary school could include the following:

General benefits

- Schools which don't have enough pupils to support a particular course would be able to offer the course via a VLE which supported pupils from more than one school, so getting sufficient numbers to justify the teaching resources.

Summative assessment

- The online assessment techniques available in VLEs are normally only used for formative assessment in colleges, because of the risk of abuse. However, in the more controlled environment of a school, online assessment could prove useful for summative testing.

Cover

- If content, schemes of work, lesson notes and assessment are already within the VLE, providing cover for absent teachers could be much easier and more effective.

Extra support

- The VLE can be a useful way of providing extra support, outside traditional hours, to students needing it. This could supplement (or even replace) expensive home tutoring.

Inter-school collaboration

- VLEs could be used as a way to foster collaboration and joint work between schools, both in the UK and internationally.

Catching up

- VLEs may be used to provide work to pupils who are dropping behind and need to catch up in some way, or to bring pupils up to a common standard –in the transition from primary to secondary school, for example.

Teachers' use of VLEs in schools

- The European Schoolnet survey (EUROPEAN SCHOOLNET, 2003) gives some indication of the nature of VLE use in European schools. Over 500 schools responded to the survey conducted between September and December 2002. Findings suggest that secondary teachers use VLEs as part of a mixture of different teaching styles, combining computer-based instruction with face-to-face teaching to form a 'blended learning' approach. Teachers use VLEs more than students, making use of their administrative and communicative capabilities: they communicate with staff in their own and other schools through VLEs, often as part of international collaboration programmes. In teaching, VLEs are used most often to teach ICT and other cross-curricular subjects.

Key areas for further research

Further areas for future enquiry might be to:

- track emerging research especially on schools in the UK that are using VLEs
- identify evidence relating to the use and development of digital content
- identify evidence relating to communications software such as discussion groups.

About the research literature

The market for VLEs is still developing and so the research literature is only beginning to emerge relating to the benefits of VLEs on teaching and learning in schools. Where research studies do exist, they have often only investigated the use of one or two functions of a virtual learning environment and not evaluated the impact of the system as a whole. Moreover, many of the systems – especially those designed for schools – are new, and many of the schools using them have only been doing so for a relatively short time.

As a result, the evidential base is limited and developers' promotional literature, together with limited case study data from early adopters (which is usually of an anecdotal nature), remain the chief sources of data when it comes to making judgements about the use and benefits of VLEs in schools in the UK.

There is more extensive evidence from further and higher education, where VLEs have been widely used for several years, but few if any of the findings relate to the impact of a full VLE. It also seems likely that school-based developments, even in the USA, are still at an early stage and consequently other projects have yet to be fully evaluated and disseminated.

Becta's FERL website [http://ferl.becta.org.uk] for the post-compulsory education sector has a Focus area for Virtual Learning Environments with various case studies about the issues associated with the implementation of VLEs in further education colleges. However, these case studies are not always of the types of systems that are targeted at the school sector.

Becta's technical paper on virtual learning environments and managed learning environments is intended to assist potential purchasers by outlining the applications, advantages, disadvantages and issues to be considered. [http://www.becta.org.uk/subsections/foi/documents/technology_and_education_research/v_&_mle.pdf]

Becta's Virtual Learning Environments in education: a review of the literature [http://www.becta.org.uk/page_documents/research/VLE_report.pdf] examines the evidence of where Managed Learning Environments and Virtual Learning Environments (and their constituent tools) are being used, and the potential benefits which are being claimed. It looks across all sectors, and takes an international as well as a UK perspective. It also considers the potential implications for the UK schools sector – what can be learnt that is transferable to practice in schools?

Key questions for schools

- Can your school sustain a VLE, financially, technically and administratively?

- Will introducing a VLE add value to the teaching and learning process, over and above current systems?

- Should your school look for intermediate solutions first, such as providing the content only?

- Is it worth considering working in a consortium with other schools or LEAs, to share costs and resources?

Bibliography and further reading

The research referred to in this briefing represents a selection from the growing field of ICT research related to VLEs, and should not be regarded as a definitive list of the 'most important' research in this area.

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This briefing and others in the 'What the Research Says' series can be found on the Becta Research website at www.becta.org.uk/research.

Becta's ICT Research Network

If you're interested in research on the use of ICT in education, you can join Becta's ICT Research Network.

The ICT Research Network seeks to encourage the exchange of information in order to inform the national agenda and professional practice.

Membership is free and is open to:

- teachers
- ICT co-ordinators
- ICT advisors
- school managers
- researchers
- policy makers
- research sponsors
- industry.

The Network provides them with an opportunity to:

- exchange information on current research
- develop partnerships
- discuss priorities for further investigation
- focus research on issues of importance to practitioners and policy makers.

They can do this via:

- an email discussion list
- publications
- conferences and events.

More information on Becta's ICT Research Network can be found at www.becta.org.uk/research/ictrn

Alternatively, email: ictrn@becta.org.uk or write to: Michael Harris, ICT Research Network, Becta, Millburn Hill Road, Science Park, Coventry CV4 7JJ

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