Sustaining eLearning Innovations

A Research Study Report

Cathy Gunn and Rhiannon Herrick
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Authors: Cathy Gunn & Rhiannon Herrick
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EXECUTIVE SUMMARY

Overview

The study explored issues of sustainability for elearning innovations that begin as funded projects in Australasian universities, and develop outside of an enterprise learning management system environment. It built on earlier research conducted by the principal investigator, and featured a literature review, and collection and analysis of data on 22 case studies by an independent researcher.

One outcome of the study is this report, identifying issues and recommending strategies to promote sustainable elearning innovations. The literature review will be made available as a separate publication.

The independent researcher played a key role in avoiding potential bias from a principal investigator whose experience has shaped strong opinions on the topic being studied. While this ensured the integrity of the research process, it also led to conclusions and recommendations that some stakeholders do not consider to be definitive strategies to support sustainable innovations. The recommendations are logical conclusions from the data collected, and offer some obvious advances. However, it must be accepted that they are not exhaustive answers to some of the more complex questions around how to sustain innovations. For this, a different mindset and organizational structures may be required. In keeping with the qualitative research tradition, all perspectives are presented for readers to peruse.

Key findings

- Most projects are started by an individual with an idea and a passion to translate the concept into reality. While respondents reported undertaking their project because there was ‘nothing out there that met their needs’ and/or ‘nothing that met their requirements’, the process used to reach this conclusion is not clear.
- The most common Critical Success Factors reported were getting the right team together, and the passion and commitment of the innovator.
- The broad consensus is that project funding for two or three years is sufficient to produce a full working prototype, but usually not a finished product that is disseminated widely and is sustainable.
- The evidence available on the worth of an innovation (in terms of impact on teaching and learning) does not appear to be either sufficient, or in a form which influences institutional players, such as IT departments and those who make management level decisions about the use of a product within an organization.
- Almost half the respondents cited difficulties in getting their products accepted and implemented or adopted by the IT department of the host institution.
- Most products do not appear to have a clear roadmap for the future in terms of development, dissemination, support or sustainability.
- Although universities have often funded development and are seen by the innovators to ‘own’ the products under the terms of employment contracts, this ownership typically does not translate into meaningful actions to sustain them.

Sustainability

The findings reveal that 16 of the 22 case studies do not meet all of the criteria for sustainability outlined in the definition on p3. This is largely due to continued dependence on the initial innovator for support for everything from answering calls from users to sourcing additional funding for further development and maintenance.

Conclusions

Four main themes run throughout the research findings:

• The meaning of sustainability is contested, with some respondents arguing that the term ‘maturity’ better expresses the goal of such developments;
• The context of the university, and questions about espoused and enacted values relating to elearning innovation and the quality of teaching and learning. There is little evidence of enacted intention, or internal processes to support development and dissemination, or even of deep understanding of the work and support needed to move an innovative product into a sustainable entity;
• The role of the innovator/s, who carry both the vision and the responsibility for making that vision concrete, at some professional and personal cost, and with limited skills for some aspects of the promotion and dissemination processes;
• Difficulties with ongoing funding, and inaccurate estimates of the time and resources needed to develop an innovative product to maturity.

Recommendations

Acknowledging that some aspects of innovation cannot be managed, and that exploratory work is required for proof of concept, the study recommends that:

• eLearning projects actively seek to incorporate project management and marketing expertise into the project team;
• Formal project management methodology is applied to development and delivery of elearning products once proof of concept has been established;
• Once an innovative concept has been tested, a formal process is used to assess likely usage and sustainability of a finished product, to analyze requirements and assess available products with similar purpose. Established software development and selection methodologies can provide a basis for this process;
• Further research is carried out to identify the causes and recommend remedies for inadequate resourcing of funded elearning projects;
• Innovators and funding bodies use available evidence, or identify experts or colleagues who are able to assist with more accurate scoping of projects;
• ELearning projects moving beyond the proof of concept stage establish an internal advisory board or steering group with specific terms of reference focused on dissemination and sustainability;
• eLearning projects identify how and to whom they will demonstrate the educational benefits of their product, and collect appropriate and relevant data to generate support and assist in dissemination;
• Universities consider and clarify the roles of key individuals, practitioners and departments in the support, evaluation and adoption of new elearning products;
• Guidelines are developed to assist in decision making around dissemination and adoption of new elearning products and practices within universities;
• Institutional structures, policies and processes describe and define the role of the university in the development and life span of elearning innovations.
Purpose

All Australasian universities support an enterprise learning management system (LMS) for efficient administration of courses, and to provide a standard suite of elearning tools for staff and students. Many specialized elearning systems and tools have evolved to offer capabilities beyond the enterprise LMS. While such initiatives attract start up grants and generous support from both local and national sources, they are not so well served in ways that ensure their long-term sustainability.

Opinions vary on the best ways to promote sustainability for elearning initiatives beyond the LMS, and where responsibility for action lies. A group of experienced practitioners from across the region drew on previous work and used local case studies to explore issues of funding, support and barriers to sustainability. The findings provide the basis for recommended strategies to improve the long-term prospects of worthy initiatives. The literature identifies this as a common and persistent problem, so the recommendations may be useful beyond the study context.

Definition

For the purpose of this study, sustainability is defined as an elearning product or system that has:

- Been developed and implemented by one or more higher education institutions;
- Passed a proof of concept stage and been judged, on the basis of evidence, as beneficial to teaching and learning;
- Produced evidence of potential to be adopted, and possibly adapted, for use beyond the original development environment;
- A support model where maintenance, use and further development are not dependent on one or a few individuals who created it, to the extent that, if their involvement ceased, future prospects would be compromised.

The role of this research

One outcome of the study is this report identifying issues and recommending practical strategies to promote sustainable and educationally effective elearning initiatives. It is based on the results of qualitative research undertaken between May and October 2011, and the findings from a literature review conducted during the same period.
METHODOLOGY

Identification of case studies
ACODE² members were invited to put forward potential case studies. Selection was made on the basis of availability of information and alignment with the aims of the study, i.e. elearning initiatives that started out as funded projects and where use has extended beyond the development environment or institution.

The pool included a variety of elearning products and tools designed to serve different educational purposes. At a general level, they are all instances of new products trying to grow and gain traction in a sector where the difference between centrally supported (enterprise) systems and those that are subject to ‘survival of the fittest’ rules is marked, and not necessarily based on educational considerations.

Method
The research included 22 case studies.

- A total of 20 respondents completed Baseline Data questionnaires.
- The principal investigator provided publicly available information on the remaining 2 case studies, which then proceeded directly to an interview.
- A total of 17 respondents were interviewed, in person, via Skype, or by telephone. Of the 5 remaining case studies:
  - 3 had relevant interview data available from a previous study by the principal investigator;
  - Interview dates could not be arranged within study timeframes in 2 cases, so only Baseline Data was used.

Baseline data
An initial questionnaire was used to collect baseline data on:

- The aim or focus of the project;
- Intended users;
- Project timelines;
- Ownership and management of the projects;
- Sources of funding;
- Programming language and version;
- Educational impact and user base;
- Plans for sustainability.

Interviews
Interview questions were developed and refined by drawing on findings from prior research, the baseline data and the literature search. The interview schedule was piloted and further refined before the remaining 16 interviews were conducted. The purpose was to explore in more depth the issues addressed in the questionnaire.

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² ACODE (the Australasian Council on Open, Distance and eLearning) is an organization for universities operating in the field defined in the title. ACODE’s mission is to enhance policy and practice in open, distance, flexible and elearning in Australasian higher education. At the date of publication, 46 institutional members represent most Australian and all New Zealand universities, and the University of the South Pacific.
THE CASE STUDIES

Functionality

The case study products belong to one of three broad functional categories:

• Teaching tools, designed to facilitate some part of the teaching process such as constructing scenarios, developing websites or marking and feedback (n=10);
• A complete course or reference material for students (n=2);
• Provision of learning support for students, through tools such as practice quizzes or peer support (n=10).

Users

All of the case studies identify students and/or teachers at tertiary institutions as their primary users. However, around one third of products (n=7) are also being used and/or targeted at secondary schools, with one more currently exploring this market. One product is being used to a limited extent to provide a service to the general public and another has ‘a very small number’ of corporate users.

DEVELOPMENT

The innovator or person with the original idea largely drives development, often with the assistance of talented programmers and/or learning designers. In most cases there is no defined end point, and products are described as works in progress, even when they have been in use within a university or elsewhere for many years.

Funding

Most case studies used more than one source of funding, so n is greater than 22.

• 11 were funded internally by institutions with a combination of grants and staffing;
• 4 had accessed funds from eCDF (eLearning Collaborative Development Fund, set up in 2003 by the NZ government to build tertiary sector elearning capacity);
• 1 used funding from Ako Aotearoa to publish good practice guidelines (AKO Aotearoa is NZ’s National Centre for Teaching Excellence and provides a range of funding to enhance teaching and learning);
• 2 used Australian Learning and Teaching Council (ALTC) funding. (ALTC provided grants and awards for tertiary teaching and learning developments in Australia)
• 6 received funding from other sources, such as the Mellon Award, The Carrick Institute (before it became ALTC) and prefunding from clients (NZ and AUS)

Age of products

Products range in age from 2-13 years. However all respondents commented that they had been working on the idea in some way before the start date provided.

Dissemination

Dissemination is most often led by the innovator/champion spreading the word through their networks and at conferences. In a number of cases, teaching and learning support units play a key role in educating users and informing the institutional community. There is no evidence of high profile ‘marketing’ campaigns or other systematic dissemination strategies involving other institutional players.
Usage

- 11 products are used in their ‘home’ university AND elsewhere nationally and/or internationally;
- 7 are used only in their home institutions;
- 1 is no longer available;
- 1 did not provide data;
- 2 products are under development and in use on a trial basis by developers only.

Support

Support for users and developers is provided through a combination of resources including the innovator, and/or:

- The institution (no department named n=4); and/or
- A specific department within the university, most frequently the teaching and learning support unit (n=8); and/or
- The user community (n=4); and/or
- A service partner or commercial organization (n=2); and/or
- Documentation and/or online help (n=8).

However it is clear that in most cases, technical and user support is largely through the individual responsible for the project.

Current status

Most of the case studies are reported as works in progress, although they are in widespread use. This is because innovators and developers are continually improving the product rather than because the software is unfinished.

Management and governance

In the majority of cases universities are seen by the innovators to ‘own’ the products because of contractual obligations, but this does not translate into meaningful actions. There is little evidence of processes or procedures, or even understanding of the work and support needed to move the product into a sustainable entity. It also seems that teaching professionals are rarely involved in governance, management or decisions around wider adoption of these elearning innovations.

Future plans

Planning for the future relies on one of four strategies:

- Continued support by the innovator, possibly assisted by an internal department;
- A move to Open Source, with respondents acknowledging both the amount of work needed for this to be possible, and that it is high risk, dependent on the successful growth of a user community;
- A move to commercialization, either independently or through partnership, usually with an external organization, and often with provision of hosted or support services rather than a software product as the core business;
- Some form of revenue generation, e.g. licensing, for the home institution.
KEY FINDINGS

Project beginnings
Most projects are started by a creative individual with an idea and a passion to translate the concept into reality. Although respondents frequently reported that they had undertaken their project because there was ‘nothing out there that met their needs’ and/or ‘nothing that met their requirements’, the process used to come to this conclusion is not clear.

Funding
Comments on the amount of funding needed for development were a common thread. Many respondents reported that they had underestimated the time it would take to develop their idea, and had therefore run out of funding at some stage.

The general consensus is that project funding for two or three years is sufficient to produce a good working prototype, but not a finished product that is disseminated widely and is sustainable. While this ‘end to end’ development process does not reflect reality for most of the case studies, it does seem to represent the expectations of funding bodies. Few sources offer second round or ongoing funding. Cases where developments are factored in to operational budgets are equally rare.

Critical Success Factors
A surprisingly large number of Critical Success Factors (CSFs) and little commonality emerged from the interviews. The most common factor was getting the right team together, with a mix of academics and technical people and this was reflected in the pedagogy and underlying research (which helped with credibility).

The passion and commitment of the champion along with persistence/stubbornness were cited in response to this question, and frequently throughout the interviews.

Some CSFs referred to the product itself, e.g. the value of the original idea, its ease of use, low barrier to entry and integration with Moodle.

The support of the institution (mostly through staff salaries and various types of internal grants) played a key role, as did other sources of available funding.

The role of IT departments
A number of respondents cited difficulties in working with the IT department of the host institution (n=9). IT departments appear to be making strategic decisions about whether to host and/or support innovative software or make it available across the institution on the basis of their own internal policies and processes. The usage and value of the product to teachers and students does not appear to be a significant factor in this decision-making process.

Strategies to circumvent restrictions imposed by IT departments were reported as common, and range from external hosting to a deliberate move to Open Source so that the product is easily and widely available.

IT departments were not interviewed for their perspective on this information, which highlights the need for further investigation.
Proving worth

When asked to provide evidence of the effect on teaching and learning, most respondents provided use statistics. Most of the innovators have published papers based on their work in scholarly journals and presented findings at conferences. Other users have done the same in many cases. However the evidence available on the worth of the innovation (in effecting teaching and learning) does not appear to be sufficient or in a form which meets the needs and expectations of institutional players such as IT departments, senior managers, and groups or individuals making decisions on the future of the product.

The future

The discussions on the future of the products focused on two key concerns:

• Maintenance and updating of the software;
• Training and support for users.

In summary it appears that:

• While some case studies have already made the move, and others are considering release as Open Source to try to address some of the challenges of sustainability, it is recognized that considerable extra work is involved in making this a realistic option, and also that resources and leadership are still required to move the product forward;
• Where an institution retains the software, developers/innovators maintain and update the software and support users while in a few cases, the institution is exploring potential to generate revenue from the support provided to users.

While some products are on a clear pathway, most do not appear to have a clear roadmap for the future in terms of development, support or sustainability. While various strategies are discussed, there is little sense of a plan (roles, responsibilities, timeline, funding) that details how the strategy will be implemented. This highlights a persistent problem of what to do when special funding and dedicated project resources run out or are redeployed. There are valid questions about whether the innovators should be expected to manage future directions, or other players with suitable skills sets should become involved.

Management and governance

Innovators often struggle to get their products to a sustainable stage once the initial development phase is completed.

The lack of any formal internal structures for development and dissemination within host universities means, in the first instance, that power to determine internal adoption, a possible key to sustainability, is often devolved by default to IT departments. In this context, uptake is piecemeal, largely dependent on awareness and an individual’s decision to opt in.

Sustainability

Despite many years of successful operation, and large, sometimes international user bases for some of the products, 16 of the 22 case studies are not sustainable within the definition used in this study (see p 3). This is largely due to the continued dependence on the initial innovator for support for everything from answering calls from users to sourcing additional funding.
Most respondents concede that, to use their own words, if they ‘fell under a bus’ the product would probably falter and ‘die’ albeit over varying lengths of time.

Of the 6 that are considered to be truly sustainable:

- 2 are Open Source and have established significant international user communities over a period of time;
- 2 provide a generic resource for all students and are well-supported by the host organization;
- 1 is being driven by a commercial organization;
- 1 has a very high level of financial commitment from a consortium and seems likely to survive because of the number of partners, the amount of capital involved and the intention to provide an enterprise system solution.
CONCLUSIONS

The themes

Four themes run throughout the research findings:

- The meaning of sustainability in this context;
- The institutional context i.e. university values, structures, policies and processes;
- The role of the innovator/s;
- The funding sources and conditions.

Defining sustainability

There was some debate during the study on the meaning and relevance of the term sustainability, with some respondents preferring to talk about getting an innovation to maturity. The debate focuses on how long a product can, and should be expected to be relevant and useful in a fast-moving technological environment. The research aimed to examine the barriers and critical success factors for initiatives that start out as funded projects rather than centrally supported elearning systems. This challenge remains significant, regardless of the terminology used to describe it.

The context

Most of these case studies have grown up in tertiary institutions with support from various streams of national and internal funding. However, until and unless Universities accept evidence of educational benefits as a reason to take ownership of the products in meaningful ways, innovators will continue to struggle with ongoing development and dissemination of their products and ideas.

Three themes emerge here: the demonstrated value placed on innovation as a process; the value of specific innovations that support teaching and learning; and the structures, policies and processes that surround the innovators and their work.

The value of innovation

Universities are seen to espouse the value of innovation, but respondents repeatedly commented on the difficulties they faced in trying to build and rely on internal support for the product they had developed. Although the universities do provide what is in some cases very generous support (usually financial) in the initial stages, there is little acknowledgement or understanding apparent of the work needed to take an innovation further, to integrate it with existing systems and practices, or to become active and ‘appreciative’ owners. Rewards for elearning innovators were extremely patchy. In some cases, detrimental effects on career development paths and prospects were reported.

Valuing teaching and learning

Universities also claim to value teaching and learning highly. However, the positive educational impact of these innovations does not seem to carry a great deal of weight in processes which might lead to their greater adoption in institutions. This remains a significant area for further investigation, to ascertain whether additional evidence of educational benefits would help to promote the cause, and if so, what forms of evidence would be required.
The need to build internal support and understanding of all aspects of elearning innovation at senior levels identified by other researchers is endorsed by these case study findings. This relates to what ownership actually means in this context, to decision-making around internal adoption, and the role of IT departments. It also raises questions about the need to present evidence, or a business case to promote institutional adoption and integration of educationally successful products. There is a perceived high risk that innovation could be stifled or neutralized by such processes, so open spirited collaboration to identify productive approaches would be required.

**Structures, policies and processes**

Other than mechanisms for approving funding, it appears that the majority of the universities involved in the case studies do not have an infrastructure that supports the ongoing development and dissemination of elearning innovations.

**The role of the innovator**

Throughout this study, it has been clear that the life and death of an innovation is largely dependent on the skills, ideas, passion, perseverance and sheer hard work of the person or people with the original idea. Products that have become sustainable according to the definition used in this study are those where the innovator has been able to take a step backwards or sideways to ‘handover’ to a university department, a user community or other contributors. It is notable that in only two of the twenty-two cases, the innovator is no longer involved in active and ongoing support of the product.

But for a project to be sustainable, this transition from *dependent on one* to *dependent on community, structures and processes* must take place.

**The funding**

Discussion on critical success factors, challenges faced, and sustainability have all referenced difficulties with funding. All the case studies have struggled to raise the funds needed to get to their current state, let alone to proceed to a point where they can stand alone. It is plainly apparent that, going forward, both funding bodies and those seeking funding need to improve skills and understanding of the resourcing levels required for development to sustainability. Some organizations offer ‘second-round’ funding to carry initiatives forward once a concept has been proved, but this is an exception rather than a rule. Some require projects to continue for a year or two after funding runs out, but still don’t attend to long-term prospects.

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RECOMMENDATIONS

Managing innovation
The idea of ‘managing’ innovation is almost an oxymoron. On the one hand, innovation is, by nature, unstructured and largely unpredictable; on the other hand, some degree of structure is needed to at least manage time lines and budgets. Innovation also requires a high level of risk taking - not all innovations succeed, and failures may be as important as successes if the experience is recorded. There is fairly wide acceptance that some aspects of innovation are more likely to be stifled than improved by tighter planning and management.

Recommendations
• The findings of the study lead to strong recommendations for managing the ongoing development and dissemination of successful elearning innovations that have passed a proof of concept stage. Critical success factors would be having the right processes and people involved to ensure that management supports, and does not stifle, innovation.
• A further recommendation is to clarify the role of IT Service departments.

The report concludes with a plea for universities to become more involved in these projects at both strategic and operational levels, and to take all steps necessary to keep the real value of the innovation and ease of access to users in central focus.

Planning and managing the project
Most of the innovations studied are the result of one or more champions who had a great idea and then pursued fund raising, development, dissemination and support activities with commitment and passion. Although there are project planning and management processes in place for the majority of the case studies, it appears that both project and budget management is largely in the hands of the innovator, usually, but not always working with a team focused on developing and implementing their original idea.

It appears from this relatively small sample of 22 innovations that more widespread use of formal project management techniques could take some of the weight off the innovator, and enhance prospects of sustainability through mechanisms designed so development and ongoing support rely on process rather than on individuals.

Recommendations
• That elearning projects actively seek to incorporate project management and marketing expertise into the project team.
• That formal project management methodology is used to drive development and delivery of elearning products after the proof of concept stage.

Needs analysis
In spite of the reported findings around the unique nature of individual products, usually there are other tools available to serve the broad purposes these developments set out to achieve.
Although these tools may not have been available at the time the case study projects started, it appears that innovators have an idea about what they perceive to be an educational problem and exactly how it should be solved. If they cannot find something that solves their problem in their way, the conclusion is ‘there’s nothing like it’ and they go ahead and create it.

This suggests that a systematic process for analyzing needs prior to development would be useful, and possibly involve a wider group, like the approach being followed by two recently started consortium projects that are included as case studies. This process could yield valuable information for use in scoping or design, as well as more detailed understanding of different perspectives on the problem and the opportunity to compare existing products.

**Recommendation**

- That prior to establishing an elearning project, there is a formal analysis process, which establishes the likely usage and sustainability of the final product. The process would include a detailed requirements analysis as well as a review of available products. There are established software development methodologies that would provide a useful basis for a tool for this purpose.

**Scoping**

There appears to be a frequent mismatch between the time and money requested to develop elearning products and services and the reality of what is required. All respondents had experienced financial difficulties at some stage of their project, and the ability to secure funding is clearly a Critical Success Factor, particularly for second round finance or allocation of operational budgets.

While the exact cause of the mismatch is not clear (underestimation, ‘scope creep’ working within the limits of available funding etc.), it appears that either the ability of funders and applicants to estimate requirements needs to be improved, or the ‘messy’ and unpredictable nature of innovation needs to be acknowledged, and more second round funding and support options made available to support this.

These case studies - and numerous other elearning projects undertaken in recent years - have accumulated considerable experience and knowledge of both the benefits and pitfalls of funding these innovations. This knowledge could be pooled in order to gain a clearer understanding of the time and resources, financial and otherwise, that are required to bring a product to maturity.

**Recommendations**

- That further research is carried out to identify the cause/s of inadequate funding of many elearning projects.
- That innovators and funding bodies identify experts/colleagues who are able to assist with more realistic scoping of projects.
- That funding models be reviewed to ascertain their suitability for purpose.

**Building support**

Feedback from the case studies suggests the need to build a broader base of support at the beginning and during early development of a project in order to establish a framework for subsequent adoption and dissemination. Several respondents noted
that a lack of internal support was a major contributor to later difficulties in two particular areas, i.e.

- In dealings with IT departments. As the discussion above indicates, there is frequent comment on a lack of acknowledgement in university IT departments of the project itself, the educational issues it has addressed and the positive effect on teaching and learning. While involving these departments in projects as early as possible might not solve the problem of institutional acceptance, it would contribute to better understanding of the role and critical design features of elearning systems that contribute to various aspects of teaching and learning. It would also raise awareness of institutional IT issues within project teams.
- In ensuring long-term sustainability. In most instances, the case studies appear to have driven adoption from the ‘bottom up’. That is, the product is developed, adopted in a specific context within the university and then disseminated, as pointed out, largely through the efforts of the innovator. There is little evidence of a strategic top-down view of dissemination and adoption such as that typically applied to an enterprise learning management system (LMS), either within the host institution or elsewhere. It is possible that wider awareness of the software and its capacity to improve teaching and learning and / or as a commercial product might facilitate earlier and higher-level exploration of some of the later arising issues around adoption and sustainability.

**Recommendation**

- That elearning projects establish an internal advisory board/reference group either at the beginning of the project or following proof of concept, with membership and terms of reference focused on promoting adoption and sustainability.

**Gathering evidence**

Following from the previous point, a key element in a case for dissemination and support would be compelling evidence that a product is making a difference to teaching and learning, and is worth supporting for the educational benefits it brings. While it was not reviewed as part of the research, there is a significant body of literature published by innovators and their colleagues on the educational impact of many of the case studies. However, it is not clear that there is data for all of the case studies available in a form that would convince the host institution that the product has a positive effect on teaching and learning. Inconsistent approaches to evaluation and reporting reflect a wider problem that affects elearning evaluation in general.

**Recommendation**

- That elearning projects identify how they will ‘prove’ the value of their product and actively collect appropriate and relevant data to be used, at least in the first instance, internally, to generate support and assist in dissemination.

**The role of the IT department**

The role of the IT department in the success of elearning projects has already been discussed (see p 7). In a number of the case studies, the IT department is seen as a

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barrier to adoption of innovations within the host institution and possibly elsewhere. There is thus an urgent need to clarify the role of these important departments with regard to such innovations, especially where the beneficial effect on teaching and learning is evident.

**Recommendations**

- Universities consider and clarify the roles and responsibilities of all individuals and departments in the adoption of new elearning products.
- Guidelines are developed to assist in decision-making around dissemination and adoption of new elearning products within the university.

**The role of the university**

Finally, the evidence from these case studies is that the role of the host university is neither well defined nor well understood in the context of developing and sustaining elearning innovations. University involvement seems to be driven by requests for funding and support at the beginning and during initial development, and then by the decisions required after development around adoption, support and the future of the product.

Given the often substantial level of funding involved, and significant and sometimes internationally recognized impact on teaching and learning, this apparent disinterest is difficult to understand.

It seems possible that if the universities concerned had a clearer understanding of their role in the development and support of elearning innovations, some of the challenges around sustainability might be discussed and addressed at a strategic level throughout the process from development to product maturity.

**Recommendation**

- Universities encourage collaboration by all interested parties to develop structures, policies and processes that describe and define the role of the university in the development and life span of elearning innovations.
QUESTIONS FOR FURTHER RESEARCH

Learning more
The recommendations offered in this report are based on the analysis of a relatively small number of case studies drawn from a particular higher education context (Australasia). An obvious question for further research would be ‘how representative are these cases of the international university sector?’ Anecdotal evidence and a large body of literature suggest the situation is common, and that further study is warranted as a way to work towards practical solutions.

In addition to the issues noted above, two further sets of questions arise from the study:
• Questions about the nature of the funding model and about the projects themselves;
• Questions around the institutional structures and processes where the innovators work.

The projects

Getting started
Given that there are many products available which have at least some functional similarities to those being developed in most of the case studies:

• What process is used to evaluate the existence and suitability of existing products?
• What criteria are used to evaluate the available options?
• Who decides whether to adapt an existing product or system, or to develop something new?
• Can information from this initial scoping / evaluation process be used to inform design or later decision making?

Dissemination
A majority of the case study projects rely on professional networks and conferences for dissemination. While this has proved to be an effective strategy, judged by the breadth of use of several of the products, it does raise the question:

• Why do innovators rely on these avenues? Does this reliance imply a lack of knowledge or understanding of alternatives, or are commentators correct when they say that different people with relevant skills sets need to be involved at these stages of the innovation process?

Funding shortfalls
What are the causes of shortfalls in funding, e.g. scoping errors, expectations, arbitrarily or externally imposed limits, and how can the problem be addressed?

Evaluation
What evidence is there to demonstrate the impact and effectiveness of each innovation in different educational settings, in particular, from the viewpoint of teachers, learners and institutions? Many projects feature in scholarly publications, although there are no common methodologies or uniform sets of data to present a coherent picture. This highlights another common problem for elearning research,
and the question is, what can be done to address it to benefit innovative elearning projects as well as more general developments in this area of educational practice?

**Type of project**

The research explored three types of product: teaching and course management tools; learning tools; and those presenting content/course work. Some of those that have become ‘finished products’ to present content or support coursework seem to have been integrated into the university structures and processes.

- Are there different issues around sustainability for different kinds of products? What factors influence this, and are there commonalities?

**The institutions**

The research raises important questions about the university perspective on the role of these projects:

- In supporting teaching and learning innovations and innovators;
- In potentially generating revenue;
- In terms of return on investment;
- In relation to strategic objectives.

This is perhaps the most significant question set of all, because the answers ultimately determine whether elearning innovators will be judged by their employers as rebels or exemplars.
## APPENDIX: THE CASE STUDIES

Case study information approved for release

This table lists case studies that granted approval for the project to be listed in the appendix to this report. One case study is not listed, as explicit consent was not given.

<table>
<thead>
<tr>
<th>Product</th>
<th>Organization / current owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahara <a href="http://mahara.org/">http://mahara.org/</a> is eportfolio software developed by a consortium of four tertiary institutions led by Massey University. It is available as an open source application, and as a commercially hosted service from partner organizations worldwide.</td>
<td>Kineo, New Zealand</td>
</tr>
<tr>
<td>ExE <a href="http://exelearning.org/">http://exelearning.org/</a> is a freely available Open Source authoring application that supports publication of web content without the need to become proficient in HTML or XML markup.</td>
<td>International Centre for Open Education, Otago Polytechnic, New Zealand</td>
</tr>
<tr>
<td>PBL Interactive <a href="http://pbl.massey.ac.nz/pbl-interactive.htm">http://pbl.massey.ac.nz/pbl-interactive.htm</a> now called Scenario Based Learning (SBL) is a suite of tools designed to enable educators to create and deliver interactive problem-based scenarios as an aid to the problem based learning (PBL) instructional method.</td>
<td>Massey University, New Zealand</td>
</tr>
<tr>
<td>Oasis <a href="http://oasis.phy.auckland.ac.nz/oasis/">http://oasis.phy.auckland.ac.nz/oasis/</a> is an online assessment and information system for students. It was developed in Electrical Engineering and is also used in Physics.</td>
<td>University of Auckland, New Zealand</td>
</tr>
<tr>
<td>StudyTXT <a href="http://petermellow.com/2010/After_School/StudyTXT/index.html">http://petermellow.com/2010/After_School/StudyTXT/index.html</a> was an important landmark in the development of mLearning. The service is no longer available but the website is left up for information on the project.</td>
<td>Auckland University of Technology, New Zealand</td>
</tr>
<tr>
<td>StartSmart <a href="http://www.uow.edu.au/student/services/fye/resources/startsmart/index.html">http://www.uow.edu.au/student/services/fye/resources/startsmart/index.html</a> is a centrally driven initiative for all first year students to learn information literacy concepts within an institutional context.</td>
<td>University of Wollongong, Australia</td>
</tr>
<tr>
<td>SNAPP <a href="http://research.uow.edu.au/learningnetworks/seeing/snapp/index.html">http://research.uow.edu.au/learningnetworks/seeing/snapp/index.html</a> is a software tool that allows users to visualize the network of interactions resulting from discussion forum posts and replies.</td>
<td>University of British Columbia, Canada</td>
</tr>
<tr>
<td>OWL (Open Web Lecture) <a href="http://www.els.qut.edu.au/innovation/emerging/owl/">http://www.els.qut.edu.au/innovation/emerging/owl/</a> is a web-based application and student response system that enables academic staff to encourage student engagement on a needs basis.</td>
<td>Queensland University of Technology, Australia</td>
</tr>
<tr>
<td>Online Marking Assistant is a consortium project that aims to automate elements of the assignment parking process.</td>
<td>Flinders University, LaTrobe University, University of Southern Queensland and Macquarie University, Australia; Massey University,</td>
</tr>
<tr>
<td>Tool</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>OceanBrowser <a href="http://ob3.cc/">http://ob3.cc/</a></td>
<td>A learning environment for medical education that helps educators and students to create, manage, collaborate and learn online.</td>
</tr>
<tr>
<td>PeerWise <a href="http://peerwise.cs.auckland.ac.nz/">http://peerwise.cs.auckland.ac.nz/</a></td>
<td>Online assessment software where students write multi-choice questions, which are answered, rated and reused by their peers.</td>
</tr>
<tr>
<td>ReView <a href="http://www.review-edu.com/">http://www.review-edu.com/</a></td>
<td>An online marking tool based around the fundamental idea of grading student’s results against predefined attributes.</td>
</tr>
<tr>
<td>PostGraduate Essentials <a href="http://www.gradresearch.unimelb.edu.au/programs/pge/pge1.html">http://www.gradresearch.unimelb.edu.au/programs/pge/pge1.html</a></td>
<td>An online course to provide PhD candidates with practical information and skills for their research studies, and opportunities to network with other students and university advisors.</td>
</tr>
<tr>
<td>Online Academic Environment</td>
<td>A collaborative initiative by a consortium of institutions to address limitations of existing LMSs.</td>
</tr>
<tr>
<td>eXams <a href="http://www.eexaminations.org/">http://www.eexaminations.org/</a></td>
<td>A secure environment that boots from a USB memory stick to allow students to use a laptop to take exams and complete assessments rather than doing them on paper.</td>
</tr>
<tr>
<td>LAMS <a href="http://www.lamsinternational.com/">http://www.lamsinternational.com/</a></td>
<td>Learning activity development software released as an open source application and also available as a suite of commercially hosted services.</td>
</tr>
<tr>
<td>Lightwork <a href="http://lightworkmarking.org/">http://lightworkmarking.org/</a></td>
<td>Online assessment management and marking software developed with NZ TEC funding by a consortium of universities led by Massey.</td>
</tr>
<tr>
<td>Lectopia (now Echo 360) <a href="http://echo360.com/">http://echo360.com/</a></td>
<td>In 2007, Lectopia was acquired and blended with video, information technology and higher education to create the EchoSystem platform for campus-wide lecture capture.</td>
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</tbody>
</table>