

# Risk assessment for the distributed e-learning regional pilots and Higher Education Academy Subject Centre projects

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## Report 1: Guidance on risk assessment

Jorj Kowszun, Cogency Research and Consulting Ltd  
Oscar Struijve, Education for Change Ltd

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# Introduction

This report is one of three documents that together form the outputs of a short study on risk assessment for two programmes:

- The JISC distributed e-learning regional pilots; and
- Higher Education Academy Subject Centre e-learning projects

Both programmes were initiated in 2004 as part of the Distributed e-Learning Strand<sup>1</sup> of JISC's programme of e-learning activity<sup>2</sup> and the projects within these programmes started early in 2005. In what follows the regional pilots and the HEA projects will be referred to collectively as "the projects".

The emphasis in this report is on the assessment of potential areas of risk to the projects. It also provides annotated links to available guidance which could help mitigate risks and avoid potential pitfalls. The two other reports to JISC address areas in which face-to-face or online training for projects may be required, identify sources of such training, and provide advice on scheduling and an ongoing support structure for these projects.

This report begins with a discussion of key concepts in risk assessment and mitigation. In particular, emphasis is placed on the importance of the psychological theory of risk perception and the cultural theory of risk management, pointing out the doubt that they cast on the rationality of all but the simplest of approaches. It then focuses in on e-learning and provides a list of the key areas of risk to the projects with evaluation, commentary and, where relevant, references to guidance provided later in the paper. Where appropriate, guidance on basic precautions is provided along with the risk areas identified. The paper finishes with an annotated list of external sources of guidance on various topics pertinent to risk management of e-learning. An Appendix is included that gives a brief literature review of the area with references for further reading.

The authors wish to emphasise that research on risk management strongly implies that holistic approaches are to be preferred to reductionistic methods. In practice this means that a small number of risk-mitigation strategies that cover a lot of ground and support the project's mission are preferable to a planned list of small reactive responses to specific risks. Furthermore, specifying *processes* rather than particular *outcomes* is to be preferred if risk is to be managed effectively.

The project team is very grateful for the input from representatives of selected projects who generously gave team members their time to describe their projects and engaged in discussion of emerging and potential risk-related issues. Without their involvement it would have been very difficult to assess the validity and relevance of the approaches to risk management as applied to the emerging and dynamic field of e-learning.

This report, by necessity, strikes a balance between the need for, on the one hand, introductory guidance on generic concepts, frameworks and techniques relating to risk assessment, and on the other hand, the wish to be sufficiently specific to allow for relatively easy application within the risk environments of the programmes and individual projects, as reflected in the terms of reference for this study<sup>3</sup>. As a result, a significant proportion of our audit and this report address guidance and supporting documents aimed at aspects of the projects' shared environment. Broadly speaking this implies a context of:

- JISC funding, programme management and support;
- (Multiple) Higher and Further Education partners and/or HEA subject centres;

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<sup>1</sup> [http://www.jisc.ac.uk/index.cfm?name=programme\\_edistributed](http://www.jisc.ac.uk/index.cfm?name=programme_edistributed). Accessed 19 April 2005

<sup>2</sup> [http://www.jisc.ac.uk/programme\\_elearning.html](http://www.jisc.ac.uk/programme_elearning.html). Accessed 19 April 2005

<sup>3</sup> "The risk assessment should focus particularly on the risks associated with the types of project and areas of work undertaken by the regional pilots and Higher Education Academy Subject Centre projects"

- An e-learning development focus, typically involving technical (ICT) development on a regional or subject basis (or combination of both).

This report, and the external guidance it refers to, is a starting point. The detailed knowledge and specific expertise available within project teams is essential and fundamental to its application in their own unique circumstances. This applies in particular to the specific technologies individual projects may seek to adopt and to the institutional environments in which projects exist and operate. Indeed, for some of the technologies used, the project teams include leading experts and are considered to be centres of expertise with regard to the technology they deploy or investigate.

# Risk management – introduction and framework

The management of risk is not an exact science. There are a few areas of human activity such as insurance and finance in which sophisticated mathematical techniques have been applied reasonably successfully to certain highly measurable aspects of risk management. Even in those areas, however, there have been some spectacular and unforeseen failures. In most areas of activity risk management is about exercising judgement based on experience. E-learning is a relatively new and rapidly developing area and replicable experience is still limited. Nevertheless, risk management practice developed in and for the field of IT projects has much relevance.

The key elements of risk management are **risk assessment** and **risk mitigation**. Risk assessment is usually analysed into three phases of activity: **risk identification**, **risk estimation** and **risk evaluation**. Risk mitigation is about deciding whether to **tolerate** a given risk or seek to reduce it in some way by taking direct action (**treat** the risk), by persuading someone else to take it on (**transfer** it) or by **terminating** the activity giving rise to the risk. A brief review of the literature giving more detail is presented in Appendix.

Risk identification is the *sine qua non* of risk management. It is not possible to deal with a risk if it has not been identified. Most risk identification activity consists of using past experience of the kinds of risks that have been identified within the area under analysis or by drawing analogies with other similar areas of activity. Identifying new risks of any significance requires thinking of things that have not happened before, which is not easy – especially in a new field such as e-learning.

Guidance literature on risk estimation and risk evaluation is based on the assumption that rational decisions can be made about the relative likelihood and potential impact of specific risks. Usually some kind of scoring system is advocated – sometimes involving several fine judgements of different areas of impact such as finance and reputation.

Research on the psychology of risk perception (see Appendix 1) undermines some of the rationality of this enterprise. Experimental evidence indicates, for example, that:

- Increased level of control over the source of a risk tends to decrease the perception of its importance;
- Willingness to take risks increases with how far in the future the consequences are likely to be felt;
- More familiar risks are treated as less important than unfamiliar ones;
- People's conceptualisation of a risk and the manner in which information about the risk is presented can affect their response to the risk. ("framing effects")

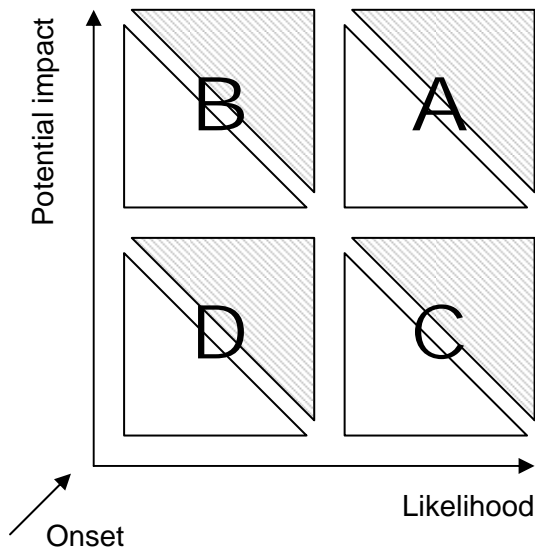
This implies that people's judgements about the relative likelihood and potential impact of a risk will tend to be flawed and that only the simplest of frameworks for making judgements can hope to yield reasonably effective controls.

Furthermore, cultural theories of risk assessment cast even more doubt on the rationality of the whole process of risk management (see Appendix). A good example of how social reality gets constructed in this area is the way that financial procedures adopted by large organisations can become a power base for particular individuals and place serious obstacles in the way of getting the job done. Research in this area (e.g. Smallman, 1996 or Royal Society, 1992) indicates that holistic approaches to risk management are more likely to be successful than reductionistic methods. In practice, this implies adopting a small number of strategies that deal with many risks at once – preferably strategies that support the organisational mission rather than have risk mitigation as their sole objective. In setting objectives for risk mitigation, specification of processes rather than particular outcomes is more likely to reduce the unintended consequences of crude target-setting. It is also consistent with the intrinsic nature of pilot activity and JISC's real and explicit interest in the development processes and the transferability of experiences and approaches taken by the projects.

It is worth emphasising that the e-learning development work we looked at takes place in HE and FE institutions that are complex human-centred organisations, and often involves collaboration between several partners. In this context, the scope for micropolitical activity is considerable and cultural issues will have a significant impact. The framework presented below allows application to these and other areas of potential risk which we present in the section 'Risk management – e-learning projects in HE'.

## Risk assessment

The diagram below shows a very simple framework for assessing individual risks that have been identified.



We have adopted this framework for the categorisation of risk areas for e-learning projects. The two main axes represent potential impact and likelihood. There are only two values on each axis: high or low. This forces a simple binary judgement to be made about any risk. There is a third dimension, also binary, that measures whether the speed of onset of the risk is considered to be slow or fast. This third dimension is rarely alluded to in the guidance literature but it makes an important difference to how a risk is treated. For example, an impending cash flow crisis usually has a relatively long onset period. During this period tactics can be deployed to try to avert the crisis. A fire in a key building, however, has very short onset and apart from immediate fire-fighting the only planned action possible is to deal with the aftermath.

This framework identifies just eight possible outcomes. These consist of the four labelled areas of the diagram, **A**, **B**, **C** and **D**, together with an indication of whether the onset of the risk is slow (**s**) or fast (**f**). So, for example, "**Bf**" refers to a risk with low likelihood but high impact that happens quickly – such as a fire. "**As**" refers to a risk of high likelihood and high impact with a slow onset – such as a cash flow crisis that would render a project untenable.

Determining where a risk fits on this model requires making simple but significant judgements about each risk. Often, the placing of a risk within this framework can be achieved by making a considered judgement about appropriate reactions. Assuming that a particular risk is to be treated (rather than tolerated, transferred or the associated activity terminated) there are natural responses to each category, as given in the following table:

Category	Response
<b>Af</b>	"All hands to the pump" – drop everything and deal with this
<b>As</b>	Major priority to take evasive action. Develop "worst case scenario" plan
<b>Bf</b>	Fire fighting: contain the crisis and implement a recovery plan
<b>Bs</b>	Develop a recovery plan. Monitor early warning signs carefully
<b>Cf</b>	Minor but regular problem: develop rapid response capability and put resources into determining causes
<b>Cs</b>	Minor but regular problem with early warning signs. Develop response capability and put resources into determining causes
<b>D</b>	Monitor to ensure it does not move in the direction of <b>A</b> , <b>B</b> or <b>C</b>

## Risk mitigation

Research into the risk management of IT projects (e.g. Baccarini *et al*, 2004) strongly suggests that good project management practice is the most effective form of risk management. Considerations of the impact of cultural theory suggest a holistic approach that specifies processes rather than outcomes. So, for example, in an e-learning project with several partners the establishment of a simple but clear partnership agreement would be an important risk mitigation strategy. Such an agreement would address a range of matters such as processes for assuring that rights to intellectual property are respected and how partners go about walking away from the project.

## Short and long-term risks

The usefulness of the concept of "onset" is that it gives a clearer way of understanding the sense in which a risk can be shorter or longer-term in its impact. In any project there are risks that have long-term consequences that will not become apparent until later in the project. These are, of course, risks with a long onset period. However, if there are early warning signs of the risk then early action could reduce the longer-term effects of the risk in a way that later action might not. Indeed, the devising of evasive manoeuvres and preparation of recovery plans is an appropriate response to risks with a slow onset phase – rather than treating them as a bridge to cross at a later stage. Risks with a short onset phase, however, may also not materialise until later in the project. A key member of staff may leave at short notice with no prior indication: the onset phase is very short but the event could happen at any stage in the project, not just the early part.

The list of project risks in the next section does not treat fast and slow onset risks separately but the likely speed of onset is signalled for each area of risk.

# Risk management – e-learning projects in HE

## Overview

The body of literature dealing with the management of risk in IT projects provides a starting point. IT development is seen as a very high-risk activity and although the literature tends to focus on technical matters, there is a clear recognition that human and cultural issues are key causal factors. In a recent study in Western Australia, Baccharini *et al* (2004) identified 27 key risks for IT projects. Of these only three were technical in character. The top five risks identified, in decreasing order of importance, were:

- Insufficient human resources
- Unrealistic schedule and budget
- Unrealistic expectations
- Incomplete requirements
- Diminished window of opportunity owing to late delivery of software

Interestingly, the main conclusion of the study was that **good project management** is the most effective 'technique' for dealing with risks in IT projects.

For the specific area of e-learning there appears to be very little published specifically about the associated risks and their management. Coen *et al* (2004) report on a JISC-funded project to assess the risks associated with e-learning investments in FE and HE. The study provides a framework for senior managers and others within institutions to assess the risks associated with e-learning *investments*.<sup>4</sup> Their concern, however, is more with the strategic and operational management of change associated with introducing new e-learning technology than with assessing the risks of particular e-learning *development* initiatives. This study is still relevant, especially considering the fact that many of the distributed e-learning projects show characteristics that go beyond 'pure' development work, covering aspects of implementation and service development and preparation.

## Institutional understanding of e-learning projects

Many of the risk areas identified in the list of project risks below involve the interface and relationship between projects and their external environment. Human and cultural issues which effect project success and the consequent uptake of outcomes are to a very significant extent found on this interface. Each project's understanding of its environment, therefore, plays a significant role in enabling successful completion and dissemination. Projects need to pay careful attention, for example, to their institutional contexts with particular priorities, needs, practices and organisational constraints. Conversely, they also need to appreciate their institutions' understandings of the projects such as, for example, their objectives and resources, the expected benefits and whether they will deliver full services or prototypes.

Lockitt (2004) addresses both points of view and provides a useful overview highlighting some of the common theories used when implementing change and provides practical activities to embed these theories. It also introduces mechanisms for influencing the project environment – including stakeholders in partner institutions – by creating an appropriate climate for change.

Opposition to change is also a major theme in the white paper *Change management and e-learning*<sup>5</sup> available from the Epic Group. It argues that cultural resistance and cultural inertia are the biggest obstacles to the implementation of e-learning and provides some guidance by presenting an approach to change management, relating it to the implementation of blended learning with practical advice and checklists for implementation.

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<sup>4</sup> More detail is provided in the Review of Literature in Appendix 1

<sup>5</sup> Available for free via [http://www.epic.co.uk/content/resources/white\\_papers/change\\_update.htm](http://www.epic.co.uk/content/resources/white_papers/change_update.htm)

## Project risks

The sources of risk to distributed e-learning projects identified by this study are listed below in rough order of their importance. This has been determined in three ways:

- Making a worst-case assessment of the risk in terms of the eight categories defined above;
- Using the particular experiences of current projects;
- If relevant, by reference to the degree of importance given to the risk in the study by Baccarini *et al* (2004) of the risk assessment of IT projects<sup>6</sup>.

In the list each risk heading is followed by one of the eight category codes<sup>7</sup> with a brief reminder of what that means in terms of likelihood, impact and onset. This is followed, where appropriate, by an indication of the significance of this risk in the Baccarini study.

For each risk an indication is given of how it has impacted on the experience of the projects – or how it might impact in the future – with examples where they are available. Any basic precautions of a generic nature are given with the text and then references are provided to the guidance section of this report, indicates with ‘S’ (for Source) followed by a number and a short descriptive label).

### 1 Insufficient or uncertain human resources

**Af:** *High likelihood, high impact, fast onset.*

This was the most important area of risk identified in the Baccarini study.

Retention of personnel is a major issue for the projects. Securing stable funding to be able to offer (project) staff a longer-term contract is a key problem. At least one project expected to lose key personnel at a crucial point in software development because of the likelihood of finding more stable employment than the relatively short-term contracts they were able to offer.

Unfortunately, this risk currently seems to be endemic to the HE and FE sectors and in the absence of wider, concerted action by the Funding Councils and other policy makers and funders can only be tolerated. In some cases, projects might consider combining different funding sources with those from JISC to be able to offer longer-term contracts to project workers.

Significant anecdotal evidence exists that the human resources and time needed to create *content* is frequently underestimated. Even with ready-made material, creating content is extremely time-intensive. Also, projects cannot assume that after creation of a *content infrastructure*, subject experts will be able to create e-learning content independently - they will require guidance and support, which is likely to increase demand for human resources both from the project team and from parent institutions.

**Guidance:** S1 Budgeting (assuring appropriate costing of sufficient human resourcing), S18 Sources of funding

### 2 Technical limitations of solutions reached or exceeded

**As:** *High likelihood, high impact, slow onset.*

The technologies used by some of the projects are at the “leading edge” of development and may not always meet prior expectations. Several of the projects depend on technology / systems development and implementation work funded by JISC and in a few cases a particular technology turned out not to be capable of providing the required solution at its current stage of development.

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<sup>6</sup> These are risks identified by commercial organisations working primarily in the development of software products for clients

<sup>7</sup> As presented in the section “Risk management - introduction and framework” under *Risk assessment*

In the end projects have to depend on informed judgement - what they know or are told by experts about the capabilities of particular technologies. It is not unreasonable for project teams to expect access to some means of trying out the current state and capabilities of relevant technology. Access to in particular test bed facilities as a standard expectation for development projects was raised as a specific request made by project representatives at a recent JISC meeting to review progress.

Examples exist of recent and relevant external evaluation work which can be helpful to some of the projects that need to assess the capabilities of specific systems and solutions. The WCET<sup>8</sup>/EduTools review of Learning Object Repository (LOR) software products<sup>9</sup> is a relevant resource, in particular, for project teams involved with Learning Objects, repository development and collaborative teaching and sharing of resources across institutions.

The ongoing review of VLEs<sup>10</sup> (or *Course Management Systems*), also by EduTools, is of potential interest across the e-learning projects and themes. Both reviews also show a useful approach to (comparative) software evaluation.

*Guidance:* S20 Technical standards, S21 Technologies

### 3 Poor partnership working

**As:** *High likelihood, high impact, slow onset.*

Some of the projects have experienced difficulties with or between project partners. Anticipatory strategies to deal with such issues exist and can be effective. In one case, a project anticipated issues with some of the project partners. Partner inputs were designed and agreed in such a way that essential aspects of development work were duplicated by more than one partner, delivering multiple, alternative versions. This deliberate redundancy was intended to reduce the chances that problems with one partner's contribution would affect progression and outcomes of the projects as a whole. Delayed or incomplete partner inputs could more easily be left for later incorporation and, if not delivered to specification, the project would only suffer to the extent that a particular developmental variant would not be part of the project outputs. This example demonstrates a trade-off between the cost and effort associated with redundancy, and reduction of risk impact.

More generically, basic precautions in this area include:

- Networking and social gatherings to get to know partners, especially those you will be working with;
- Finding out about partners' organisational structures and the key organisational issues that are currently under discussion;
- Basic stakeholder analysis – brainstorm all stakeholders: internal and external. For each one, decide whether their potential impact is high or low and whether their interest in the project is high or low. Concentrate on the stakeholders with high impact and high interest (but keep a watching brief on the ones with high impact and low interest). JISC has provided a useful stakeholder analysis template for more detailed work;
- Continual monitoring of stakeholder relationships – these can and do change over time;
- The partners themselves are, of course, key stakeholders. It is important to have a clear idea of what each partner hopes to get out of the project and how that matches their current needs;
- Partnership agreement. It is often not necessary or desirable that HE and FE partners should enter into a complex legal contract with each other for a joint development project.

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<sup>8</sup> Western Cooperative for Educational Telecommunications, a membership organisation open to providers and users of educational telecommunications. Members represent the higher education community, nonprofit organisations, schools, and corporations. Most WCET's members are in the U.S.A.

<sup>9</sup> *Learning Object Repository Software - Research Project Final Report*, November 12, 2004. Available from <http://www.edutools.info/lor/>.

<sup>10</sup> See <http://www.edutools.info/course/>

However, it is wise to set down in writing what the expectations are of each partner in clear and simple terms and get agreement from all partners.

Whatever precautions are taken or considered in individual circumstances, development processes become definitely easier and more 'risk-resistant' if everyone involved is committed to the project and departmental and personal agendas do not dominate. The presence of a single dedicated project manager is often seen as essential for keeping projects on target.

*Guidance:* S14 Negotiating skills, S19 Stakeholder Analysis

## 4 Sustainability

**As:** *High likelihood, high impact, slow onset.*

If a project is identified as unsustainable it means in practice that there has ultimately come a point when the likelihood of 'failure' in this area is seen as very high: typically this has a long onset period, hence the "**As**" category. From the point of view of sustainability the HEA and regional pilot e-learning projects fall into two types:

- Projects for which JISC funding enables partners to set up new distributed e-learning development activity that has the character of a capital investment. For these projects what matters for sustainability is foremost completing the project in a satisfactory way using the available JISC funding. The majority of projects are at least in part of this type.
- Projects for which JISC funding initiates an activity that will continue after the funding has been used up. For these projects what also matters is finding alternative sources of funding for the longer term.

Many projects show characteristics of both types. Three areas of project activity are frequently mentioned as having a significant positive impact on sustainability: monitoring of the external environment (to align project direction and progression with evolving needs, developments and opportunities), user-centred design and allocating sufficient time for testing and evaluation.

*Guidance:* S4 Evaluation methods, S18 Sources of funding, S19 Stakeholder Analysis

## 5 Unrealistic expectations

**As:** *High likelihood, high impact, slow onset.*

This was the third most important area of risk identified in the Baccarini study.

The projects appear to set themselves modest and realistic expectations for project outcomes. However, the large numbers of partners in many projects increases the likelihood of a mismatch in expectations. Some project managers expressed the private belief that particular partners would not deliver because they had set their sights too high.

Basic precautions include:

- As part of the planning process it makes sense to complete a simple audit exercise to map the skills and competencies of the partner groups that are relevant to the project. This can be undertaken in conjunction with a Stakeholder analysis and matched to an "ideal" profile of skills and competencies that the project requires and any gaps dealt with by finding alternative sources of expertise.
- A similar audit of technological and infrastructural capabilities can be combined with the audit of skills and competencies. However, it may be better done separately if it is likely to involve a different group of people.
- Project partners and their network of external contacts provide an excellent source of critique, especially of assumptions underlying the project and how realistic they are

*Guidance:* S15 Project Management (particularly the need to build in time for skills and technology audits)

## 6 Poor leadership

**As:** *High likelihood, high impact, slow onset.*

The leadership provided by the project manager and the steering committee can be a major factor in the success of a project. The assessment category "**As**" assumes a worst-case scenario in which leadership is lacking to the extent that the project becomes untenable. "**Cs**" is in many cases probably a more appropriate categorisation. There was no evidence of poor leadership in the projects and this item is included for completeness.

In all events, Steering Committees need to hold the project manager appropriately accountable and provide guidance. The project manager needs to respond flexibly to events. Lack of senior management support can be a cause of poor or ineffective leadership in an otherwise well-led project.

*Guidance:* S15 Project Management (especially the importance of monitoring and keeping the pace of the project moving)

## 7 Litigation in protecting intellectual property rights (IPR)

**Bf:** *Low likelihood, high impact, fast onset.*

This is potentially a big issue for Higher Education. The JISC has established and brokered courses, developed a website and established an e-mail helpline to support projects.

High-profile cases brought by powerful companies such as Microsoft have raised the temperature in this area considerably. This contributes to reduced willingness of people and organisations to share resources - either because they feel their own IPR may be compromised or because there might be a third-party IPR claim they are not aware of.

It is common in the HE sector to seek to transfer IPR risks through agreements that place the burden of identifying the ownership of intellectual property with the person using it - in a learning object, for example. It is worth considering whether it is possible to adopt an alternative model which might retain some risk at an institutional level and give some flexibility to those designing learning materials.

*Guidance:* S8 Intellectual property rights

## 8 Application software not fit for purpose

**Bf:** *Low likelihood, high impact, fast onset.*

This has already impacted on at least one project and is closely related to the item on *unrealistic expectations* (risk area 5 above). This can be very hard to predict and a thorough initial investigation of any application software is strongly recommended.

There is a risk that institutional stakeholders (staff, students, management) will feel outcomes do not meet their needs and time was devoted needlessly to developing systems: "To fit into the complex environment ... the manifestations of information technology need to be calibrated more precisely to the particular purpose at hand".<sup>11</sup>

Involving an observant champion to prevent a project from 'drifting' will militate against this. Regular communication with staff throughout the entire project is essential to develop desired features. Ongoing relationship with 'champions' and sharing responsibilities will help to ensure active involvement with the project. We suggest, perhaps controversially, that (e.g. monetary) contributions by the 'customer' institution can bring better commitment and motivation. Promises that have been made, or even perceived promises, will be expected to be kept. The likelihood of failure in this area increases with adoption of very new technology

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<sup>11</sup> Edward L. Ayers, *EDUCAUSE Review*, vol. 39, no. 6 (November/December 2004): 48–62. The Academic Culture and the IT Culture: Their Effect on Teaching and Scholarship.

and applications. The contributing institutions should always be informed if they are participating in prototype development.

*Guidance:* S15 Project Management (particularly the need to build in time to check out the appropriateness of third party products)

## 9 Failure to meet technical standards

**Bs:** *Low likelihood, high impact, slow onset.*

There does not appear to be any evidence of this risk in the projects currently. Typically, project teams are well aware of the need and benefits of embracing and complying with relevant standards. However, the effect of failure to meet technical standards is only likely to be felt once the project is completed. Some concerns were expressed regarding the level of 'maturity' of potentially relevant emerging standards, and the uncertainties this brings for project teams. The choice of "Bs" category reflects the "worst-case" situation in which the outcome of a project becomes unusable because it fails to interoperate with other e-learning developments. However, in key areas like e-portfolios and digital repositories recent work by IMS to establish functional models and interoperability standards can benefit many of the projects as well as the infrastructures they will rely on.

Apart from the worst case, the more typical category would be "D" and would require monitoring of developments in major relevant technology areas, as is already ongoing by JISC, CETIS and others.

*Guidance:* S20 Technical standards

## 10 Failure to meet JISC's objectives

**Bs:** *Low likelihood, high impact, slow onset.*

JISC provides detailed guidelines on its aims and objectives and its expectations about the outcomes of projects. Projects need to make sure that they are very clear about JISC's expectations. Meetings with JISC officers should be used to test interpretations against aspirations for the project. JISC's procedures, guidelines and templates for project reporting have been refined over time and capture the criteria on which JISC wants to monitor, steer and/or intervene.

*Guidance:* S10 JISC's aims and objectives, S11 JISC's expectations of deliverables (and project management and reporting guidelines), S9 JISC expectations for dissemination

## 11 Lack of formal change management process

**Bs:** *Low likelihood, high impact, slow onset.*

One of the strategic risks identified and dealt with by Coen *et al* (2004) in a JISC-funded study of the risks associated with the strategic and operational management of change needed for the introducing new e-learning technology (see Appendix for more details).

Their research is very useful in considering how an institution might approach making a new e-learning investment decision and the issues associated with its implementation. It is of limited relevance to the projects since the strategic decisions have effectively already been made. However, if there are indications that change management might be a problem it is worth re-visiting the strategic decision. To this end Coen *et al* provide a useful list of questions to ask about the associated e-learning strategy:

- How will overseas markets affect your e-learning strategy?
- How might funding council policies affect your institutions e-learning?
- Have you considered the legal implications of your e-learning strategy?
- What type of e-learning strategy have you developed?
- What are the objectives of your e-learning investment?

- Does your strategy include collaboration?
- How will you fund your e-learning investments?
- Is the e-learning investment sustainable?
- How will working practices and staff roles be affected by e-learning?
- How will coordination/collaboration across different categories of staff be achieved?
- What staff skills will be required to support e-learning?
- What skills will students need to develop in order to participate in e-learning?
- How centralised-decentralised are your technology support structures?
- What is the impact of e-learning on organisational structures?
- What structures are in place to support students in their e-learning?
- Should you buy, make or use open source technologies?
- Is your network infrastructure adequate?
- What are the risks of Virtual and Managed Learning Environment investments?
- Are your technologies integrated and resilient?
- How will you manage change?
- How are your e-learning projects managed?
- How do you appraise options and evaluate projects?
- How is the quality of e-learning managed?

This checklist can serve as a 'memory aid' in identifying a wide range of issues which determine or influence actions and decisions in the project environment, and links to many of the other risk areas presented in this section.

In addition, the Lockett (2004) paper mentioned before introduces theories for implementing change with practical activities to embed these and create a climate for change; whilst the *Change management and e-learning*<sup>12</sup> white paper from the Epic Group presents a method for change management, relating it to the implementation of blended and e-learning.

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<sup>12</sup> Available for free via [http://www.epic.co.uk/content/resources/white\\_papers/change\\_update.htm](http://www.epic.co.uk/content/resources/white_papers/change_update.htm)

## 12 Harmful competitive actions

**Cf:** *High likelihood, low impact, fast onset*

As with other items, the assessment of "Cf" is a worst-case one and probably "D" is more typical. However, this can become relevant in projects that have commercial implications, especially with an HE institution looking towards international markets. There is no evidence of this in the current projects and this item is included for completeness.

## 13 Unreasonable project schedule and budget

**Cs:** *High likelihood, low impact, slow onset*

This was the second most important area of risk identified in the Baccarini study.

Project managers generally have significant experience of managing projects and recognise that there are always unforeseen pressures on time and budget. A small number of projects, however, have already experienced project "turbulence" and are having to adjust their budgets and schedules accordingly. This is closely related to risks associated with unrealistic project expectations and with poor or insufficient leadership in projects and their direct environment.

*Guidance:* S1 Budgeting, S15 Project Management

## 14 Contract negotiation and management

**Cs:** *High likelihood, low impact, slow onset*

This was an important area of risk identified in the Baccarini study (fifth item)

Reliance on commercially produced third-party software is already a problem for one or two of the projects. Where there is dependence on a particular supplier there is a risk the project might be "held to ransom" because of their reliance on a specific product. Furthermore, difficulties may arise if bespoke adaptations are needed or specific knowledge about underlying programming is required to interoperate with other software. For some projects this has opened up a debate about the relative merit of open source products and bespoke software.

Contractual difficulties may also arise in relation to the regulatory requirements of HEFCE and LSC. The funding contract with HE and FE institutions may be restrictive in its effect on e-learning, especially where definitions of what constitutes tuition are concerned. This is a low risk but needs to be considered where HE and FE institutions are working in partnership.

*Guidance:* S2 Contract management, S7 HEFCE contracts, S12 Legal and regulatory, S13 LSC contracts, S14 Negotiating skills

## 15 Failure to meet various regulatory standards

**Cf:** *High likelihood, low impact, slow onset*

The HE and FE sectors are subject to a vast array of regulation and legislation which places requirements on the institutions that have to be met. Failure to meet these requirements need not be disastrous but there are a few areas in which the consequences of non-compliance can be significant. In particular:

- Children's Act (especially working with FE colleges that deal with 14-19 year-olds)
- Disability Discrimination Act
- Health, Safety and Security
- Data protection
- Freedom of Information

HE and FE institutions will have officers with specific roles to support compliance in these areas and they are probably the most useful sources of guidance. However, projects need

first to ascertain whether any of the above regulatory regimes impact on their activities. For example, several projects deal with the interchange of personal data and recognise that not only Data Protection but also the Children's Act and the Freedom of Information Act could impact on their activities. They have taken advice from their internal experts and from JISC Legal to be sure of their responsibilities.

The issues relating to regulatory standards become particularly pressing where projects intend to deposit materials in external (e.g. national) repositories, such as The JISC Online Repository for Learning and Teaching Materials (JORUM)<sup>13</sup>, with user communities potentially much wider than project partners' own staff and students. Taking account of Developments in Digital Rights Management and creation and collection of appropriate metadata will enhance the opportunities for re-use of and exchange of learning objects.

*Guidance:* S3 Data protection, S5 Freedom of Information, S6 Health, Safety and Security, S12 Legal and regulatory. Also aspects of S21 Technologies (e.g. JORUM documentation)

## 16 Poor Evaluation

**D:** *Low likelihood, low impact (but could become a problem if not attended to)*

It is important to JISC that projects use robust evaluation methods in order to inform future funding priorities. Poor evaluation of **processes** can lead to a failure to learn from mistakes, especially if insufficient attention is given to causal factors.

*Guidance:* S4 Evaluation methods

## 17 Poor Quality Assurance

**D:** *Low likelihood, low impact (but could become a problem if not attended to)*

Quality assurance should be built into the project management process. However, there may be specific quality issues associated, for example, with projects producing e-learning materials. There is a particular issue with Learning Objects, their definition and reuse.

It is possible to apply a risk management paradigm to quality assurance. This is a relatively recent development and the literature in this area is limited (e.g. Cutter, 1993). This approach to quality assurance is based on identifying and assessing risks to:

- The stated quality of the product or service (e.g. delivery times) and
- The organisation in failing to assure a particular standard of quality.

This brings to the process of quality assurance a useful additional dimension of assessing the extent to which effort should be applied to improving particular quality characteristics. The method of "risk-benefit analysis" is of particular relevance in this area. This is about estimating the costs of reducing risks and matching it against the benefit of reducing those risks.

*Guidance:* S15 Project Management, S16 Quality assurance methods

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<sup>13</sup> intended to be operational as a service from August 2005

## Sources of Guidance

As far as possible, guidance in the table below has been focussed on JISC or JISC-supported resources, but other resources are referenced where relevant. Further literature references are provided separately in the Appendix.

Area	Possible source(s)	Comments
S1 Budgeting	<p><a href="http://www.cimaglobal.com/main/resources/knowledge/search.htm">CIMA knowledge bank</a> http://www.cimaglobal.com/main/resources/knowledge/search.htm</p> <p><a href="http://www.jisc.ac.uk/proj_manguide22.html">JISC project budgeting guidelines</a> http://www.jisc.ac.uk/proj_manguide22.html</p> <p><a href="http://www.wcet.info/projects/tcm/">WCET's Technology Costing Methodology Project (TCM)</a> http://www.wcet.info/projects/tcm/</p>	<p>A wide range of articles and briefing notes – use the site search engine</p> <p>This includes a budget template</p> <p>Step-by-step procedures to analyse the costs of using technology in both on- and off-campus instruction. Focus on using technology but includes development stage(s).</p>
S2 Contract management	<p><a href="http://www.jisclegal.ac.uk/index.html">JISC Legal</a> (search for “contracts”) http://www.jisclegal.ac.uk/index.html</p> <p><a href="http://www.jiscinfonet.ac.uk/InfoKits/contract-negotiation">JISC infokit on contract negotiation</a> http://www.jiscinfonet.ac.uk/InfoKits/contract-negotiation</p> <p>See also: S12 Legal and regulatory S7 HEFCE contracts S13 LSC contracts</p>	<p>Contract-related law is not dealt with separately but appears throughout the site. There is an e-mail support service</p> <p>On-line course, covering the full range of issues</p>
S3 Data protection	<p><a href="http://www.jisclegal.ac.uk/dataprotection/dataprotection.htm">JISC Legal – data protection</a> http://www.jisclegal.ac.uk/dataprotection/dataprotection.htm</p> <p><a href="http://www.informationcommissioner.gov.uk/">Information Commissioner's Office</a> http://www.informationcommissioner.gov.uk/</p>	<p>Includes an e-mail support service</p> <p>Covers other issues, including freedom of information. Has a good current issues section</p>
S4 Evaluation methods	<p><a href="http://www.jiscinfonet.ac.uk/Resources/evalkit">JISC evalkit</a> http://www.jiscinfonet.ac.uk/Resources/evalkit</p>	<p>A large directory of ICT-based evaluation toolkits</p>
S5 Freedom of Information	<p><a href="http://www.jisclegal.ac.uk/freedomofinformation/freedomofinformation.htm">JISC Legal – Freedom of Information</a> http://www.jisclegal.ac.uk/freedomofinformation/freedomofinformation.htm</p>	<p>Includes a link to a staff training video for download or streaming. There is an e-mail support service</p>

Area	Possible source(s)	Comments
	<a href="http://www.informationcommissioner.gov.uk/">Information Commissioner's Office</a> http://www.informationcommissioner.gov.uk/	Covers other issues, including data protection. Has a good current issues section.
S6 Health, Safety and Security	<a href="http://www.hse.gov.uk/">Health and Safety Executive</a> http://www.hse.gov.uk/	A wide range of guidance and briefing – use the site search engine
S7 HEFCE contracts	<a href="http://www.hefce.ac.uk/">Higher Education Funding Council for England (HEFCE)</a> http://www.hefce.ac.uk/	Guidance available in many parts of the site
S8 Intellectual property rights	<p><a href="http://www.jisclegal.ac.uk/ipr/IntellectualProperty.htm">JISC Legal – intellectual property</a> http://www.jisclegal.ac.uk/ipr/IntellectualProperty.htm</p> <p><a href="http://www.w3.org/IPR/">World wide web consortium</a> http://www.w3.org/IPR/</p> <p><a href="http://www.ipr-helpdesk.org/index.htm">IPR-Helpdesk</a> http://www.ipr-helpdesk.org/index.htm</p> <p><a href="http://www.wipo.int/">World intellectual property organisation (WIPO)</a> http://www.wipo.int/</p> <p><a href="http://www.sice.oas.org/int_prop.asp">SICE foreign trade information IPR pages</a> http://www.sice.oas.org/int_prop.asp</p> <p><a href="http://www.intrallet.com/drm-study/Interim_Report.pdf">Digital Rights Management Study</a> by Intrallet for the JISC. http://www.intrallet.com/drm-study/Interim_Report.pdf</p>	<p>There is an e-mail support service</p> <p>Has a number of useful links to sources of ICT-specific guidance</p> <p>A free EU-funded service</p> <p>Good on international issues</p> <p>Trade-related international perspective</p> <p>See also the Feature: <a href="http://www.jisc.ac.uk/index.cfm?name=digital_rights_man_feature_290704">Digital Rights Management - What it is and JISC's involvement</a>. http://www.jisc.ac.uk/index.cfm?name=digital_rights_man_feature_290704</p>
S9 JISC expectations for dissemination	<a href="http://www.jisc.ac.uk/proj_manguide26.html">JISC dissemination guidelines</a> http://www.jisc.ac.uk/proj_manguide26.html	Detailed guidance and expectations provided by JISC as part of its project management guidelines
S10 JISC's aims and objectives	<a href="http://www.jisc.ac.uk/index.cfm?name=programme_elearning">JISC e-learning programme</a> http://www.jisc.ac.uk/index.cfm?name=programme_elearning	Aims and objectives of JISC's e-learning programme
S11 JISC's expectations of deliverables	<a href="http://www.jisc.ac.uk/proj_manguide12.html">JISC guidance on deliverables</a> http://www.jisc.ac.uk/proj_manguide12.html	Detailed guidance on deliverables provided by JISC as part of its wider <a href="http://www.jisc.ac.uk/index.cfm?name=proj_manguide">project management guidelines</a> (http://www.jisc.ac.uk/index.cfm?name=proj_manguide)

Area	Possible source(s)	Comments
S12 Legal and regulatory	<a href="http://www.jisclegal.ac.uk/index.html">JISC Legal</a> <a href="http://www.jisclegal.ac.uk/index.html">http://www.jisclegal.ac.uk/index.html</a>  <a href="http://www.hefce.ac.uk/">Higher Education Funding Council for England (HEFCE)</a> <a href="http://www.hefce.ac.uk/">http://www.hefce.ac.uk/</a>	<p>There is an e-mail support service. JISC Legal also provides a range of topical information and case studies on its website and through workshops and dissemination events. See S2, S3, S5 and S8 for further specific topics.</p> <p>Guidance available in many parts of the site</p>
S13 LSC contracts	<a href="http://www.lsc.gov.uk/">Learning and Skills Council (LSC)</a> <a href="http://www.lsc.gov.uk/">http://www.lsc.gov.uk/</a>	<p>Guidance available in many parts of the site</p>
S14 Negotiating skills	<a href="http://www.jiscinfonet.ac.uk/InfoKits/contract-negotiation">JISC infokit on contract negotiation</a> <a href="http://www.jiscinfonet.ac.uk/InfoKits/contract-negotiation">http://www.jiscinfonet.ac.uk/InfoKits/contract-negotiation</a>	<p>On-line course including contract negotiation</p>
S15 Project Management	<a href="http://www.jiscinfonet.ac.uk/InfoKits/project-management">JISC infokit on project management</a> <a href="http://www.jiscinfonet.ac.uk/InfoKits/project-management">http://www.jiscinfonet.ac.uk/InfoKits/project-management</a>  <a href="http://www.jisc.ac.uk/proj_manguide.html">JISC project management guidelines</a> <a href="http://www.jisc.ac.uk/proj_manguide.html">http://www.jisc.ac.uk/proj_manguide.html</a>	<p>On-line course: in-depth, covering a wide range of techniques</p> <p>Detailed guidance on JISC's expectations for project plans and their management</p>
S16 Quality assurance methods	<a href="http://www.ogc.gov.uk/sdtoolkit/reference/deliverylifecycle/quality_management.html">Office of Government Commerce</a> <a href="http://www.ogc.gov.uk/sdtoolkit/reference/deliverylifecycle/quality_management.html">http://www.ogc.gov.uk/sdtoolkit/reference/deliverylifecycle/quality_management.html</a>  <a href="http://www.efqm.org/">European Foundation for Quality Management (EFQM)</a> <a href="http://www.efqm.org/">http://www.efqm.org/</a>	<p>Guidance for the public sector on quality management</p> <p>The EFQM Excellence Model described in detail</p>
S17 Risk management	<a href="http://www.jiscinfonet.ac.uk/InfoKits/risk-management">JISC infokit on risk management</a> <a href="http://www.jiscinfonet.ac.uk/InfoKits/risk-management">http://www.jiscinfonet.ac.uk/InfoKits/risk-management</a>  <a href="http://www.hefce.ac.uk/pubs/hefce/2005/05_11/">HEFCE risk management guide</a> <a href="http://www.hefce.ac.uk/pubs/hefce/2005/05_11/">http://www.hefce.ac.uk/pubs/hefce/2005/05_11/</a>	<p>On-line course: in-depth but inclined to favour technical methods at the expense of cultural and psychological issues</p> <p>A guide to good practice, prepared for HEFCE by PricewaterhouseCoopers</p>

Area	Possible source(s)	Comments
S18 Sources of funding	<p>In addition to <a href="#">JISC</a>, <a href="#">HEFCE</a>, <a href="#">HEA</a> and <a href="#">LSC</a> funding may also be available from:</p> <p><a href="#">EC eLearning initiative</a>  <a href="http://europa.eu.int/comm/education/programmes/elearning/index_en.html">http://europa.eu.int/comm/education/programmes/elearning/index_en.html</a></p>	<p>See also:</p> <p><a href="#">Arts and Humanities Research Board</a>  <a href="#">British Academy (Arts and Social Sciences)</a>  <a href="#">Economic and Social Research Council</a>  <a href="#">European Science Foundation</a>  <a href="#">Ford Foundation</a>  <a href="#">Leverhulme Trust</a>  <a href="#">The Royal Society</a>  <a href="#">The Wellcome Foundation</a></p>
S19 Stakeholder Analysis	<p><a href="#">JISC stakeholder analysis template</a>  <a href="http://www.jiscinfonet.ac.uk/InfoKits/infokit-related-files/stakeholder-analysis-template/view">http://www.jiscinfonet.ac.uk/InfoKits/infokit-related-files/stakeholder-analysis-template/view</a></p>	<p>Useful template for detailed analysis. Should be combined with an <a href="#">impact-interest analysis</a> and used only for those stakeholders with high potential impact</p>
S20 Technical standards	<p><a href="#">Centre for educational technology interoperability standards (CETIS)</a>  <a href="http://www.cetis.ac.uk/">http://www.cetis.ac.uk/</a></p> <p><a href="#">JISC TechWatch</a>  <a href="http://www.jisc.ac.uk/index.cfm?name=techwatch_home">http://www.jisc.ac.uk/index.cfm?name=techwatch_home</a></p> <p><a href="#">World wide web consortium</a>  <a href="http://www.w3c.rl.ac.uk/">http://www.w3c.rl.ac.uk/</a></p> <p><a href="#">IMS Global Learning Consortium</a>  <a href="http://www.imsglobal.org/">http://www.imsglobal.org/</a></p> <p><a href="#">IMS ePortfolio Information Model</a>  <a href="http://www.imsglobal.org/ep/epv1p0pd/imsep_infov1p0pd.html">http://www.imsglobal.org/ep/epv1p0pd/imsep_infov1p0pd.html</a></p>	<p>CETIS represents UK higher-education and further-education institutions on international learning technology standards initiatives (JISC funded)</p> <p>Emerging technologies and their likely future impact. Commissions and publishes reports on specific technologies and provides links to technology resources elsewhere on the Web.</p> <p>UK and NI local office website</p> <p>Supports the adoption and use of learning technology worldwide. In the specific examples in the next table we highlight guidance and standards relating to digital repositories and ePortfolios, but much more guidance and information is available from this site. Some key documents highlighted below</p> <p>Revision: 20 September 2004. Version 1.0 Public Draft</p>

Area	Possible source(s)	Comments
	<p><a href="#">IMS Digital Repositories Interoperability - Core Functions Information Model</a>  <a href="http://www.imsglobal.org/digitalrepositories/driv1p0/imsdri_infov1p0.html">http://www.imsglobal.org/digitalrepositories/driv1p0/imsdri_infov1p0.html</a></p> <p><a href="#">WCET /EduTools review of LOR software</a>  <a href="http://www.edutools.info/lor/">http://www.edutools.info/lor/</a></p>	<p>Revision: 13 January 2003. Version 1.0 Final Specification</p> <p>WCET / EduTools team conducted a reviews of Learning Object Repository (LOR) software products. Report published November 2004. Includes some good 'top level' info on standards, interoperability and accessibility.</p>
S21 Technologies	<p><a href="#">JISC TechWatch</a>  <a href="http://www.jisc.ac.uk/index.cfm?name=techwatch_home">http://www.jisc.ac.uk/index.cfm?name=techwatch_home</a></p> <p><a href="#">OSS Watch</a>  <a href="http://www.oss-watch.ac.uk/">http://www.oss-watch.ac.uk/</a></p> <p><a href="#">IMS ePortfolio Best Practice and Implementation Guide</a>  <a href="http://www.imsglobal.org/ep/epv1p0pd/imsep_bestv1p0pd.html">http://www.imsglobal.org/ep/epv1p0pd/imsep_bestv1p0pd.html</a></p> <p><a href="#">IMS Digital Repositories Interoperability - Core Functions Best Practice Guide</a>  <a href="http://www.imsglobal.org/digitalrepositories/driv1p0/imsdri_bestv1p0.html">http://www.imsglobal.org/digitalrepositories/driv1p0/imsdri_bestv1p0.html</a></p> <p><a href="#">JISC infokit on system selection</a>  <a href="http://www.jiscinfonet.ac.uk/InfoKits/system-selection">http://www.jiscinfonet.ac.uk/InfoKits/system-selection</a></p> <p>The <a href="#">JORUM Service Set-up Documentation</a>.  <a href="http://www.jorum.ac.uk/service/documentation.html">http://www.jorum.ac.uk/service/documentation.html</a></p>	<p>Emerging technologies and their likely future impact. Commissions and publishes reports on specific technologies and provides links to technology resources elsewhere on the Web.</p> <p>JISC funded site providing advice about free and open source software for FE and HE</p> <p>Revision: 20 September 2004. Version 1.0 Public Draft</p> <p>Revision: 13 January 2003. Version 1.0 Final Specification. Includes technology recommendations and examples relating to Xquery, Z39.50, SOAP and the OAI Model.</p> <p>Online course taking a strategic project management approach</p> <p>The JORUM Repository for Learning and Teaching Materials is intended to become operational in August 2005. Information is available on rationale, functionality and requirements and there is a training guide and sample content package. Of interest beyond those who will use the service.</p>
Generic support	<p><a href="#">JISCmail</a>  <a href="http://www.jiscmail.ac.uk/maillinglists/category/index.htm">http://www.jiscmail.ac.uk/maillinglists/category/index.htm</a></p>	<p>You may find a mailing list that deals with your particular issue</p>

Area	Possible source(s)	Comments
	<p data-bbox="451 219 879 286"><a href="#">WCET /EduTools review of LOR software</a></p> <p data-bbox="451 297 818 331"><a href="http://www.edutools.info/lor/">http://www.edutools.info/lor/</a></p> <p data-bbox="451 481 911 515"><a href="#">The eLearning Developers' Journal</a></p> <p data-bbox="451 526 911 593"><a href="http://www.elearningguild.com/pbuilder/linkbuilder.cfm?selection=fol.16">http://www.elearningguild.com/pbuilder/linkbuilder.cfm?selection=fol.16</a></p>	<p data-bbox="933 219 1374 454">WCET / EduTools team conducted a review of Learning Object Repository (LOR) software products. Report published November 2004. Includes some good 'top level' info on standards, interoperability and accessibility.</p> <p data-bbox="933 481 1374 683">Articles and reports relating to strategies and techniques for designing, developing and managing e-Learning. Note: some full texts only accessible for members of the eLearning Guild.</p>

# Appendix 1

## Brief Review of Literature

*A brief review of recent and current literature on risk management*

Risk management has become a recognised corporate discipline and its practitioners are becoming specialists in this field with their own professional bodies such as the Institute of Risk Management (*IRM: www.theirm.org*) or the Association of Local Authority Risk Managers (*ALARM: www.alarm-uk.org*).

There is a considerable body of literature providing guidance and advice on how to manage risk. Adams (1995) gives a very comprehensive account of the subject, its techniques and the areas of dispute between different practitioners. More recently, Larkin (2002) has produced an exhaustive text on the management of risks associated with an organisation's reputation and her book indicates a trend towards specialisation in the literature as the discipline becomes more established.

The basic premise of risk management is that it is possible to establish a rational and cost-effective framework of activity in which risks are anticipated and actions taken to mitigate their effects. Attempts have been made to codify the cost-benefit of risk management by Starr (1972) and Cutter (1993), who coined the term "risk-benefit analysis". Writers such as Douglas (1990, 1992), Slovic (1986, 1987) and Wildavsky (with Douglas, 1982) have successfully challenged the apparent rationality of some of the activities of risk management.

Anticipation and mitigation are the two key ingredients of risk management. The literature on the anticipation of risk offers a variety of analyses of the process. However, key sources such as Adams (1995) and the Royal Society (1992) analyse risk assessment into three distinct phases of activity:

- **risk identification:** perceiving hazards; identifying failures; recognizing adverse consequences
- **risk estimation:** estimating risk probabilities; describing risks; quantifying risks
- **risk evaluation:** estimating significance of risks; judging acceptability of risks; comparing risks against benefits

There is not the same measure of agreement about activities that seek to mitigate the effects of risk. Some writers such as Fuller (2000) focus on the choice to be made about the relative mix of physical, management and human factor controls in constructing interventions to mitigate risk. Others such as Fischhoff *et al* (1978) and Granot (1998) draw attention to the decision-making process associated with selecting mitigation strategies.

The concept of "risk" is given a variety of meanings in the literature and four distinct themes emerge.

The Royal Society Study Group defines risk as

“...the probability that a particular adverse event occurs during a stated period of time, or results from a particular challenge” (Royal Society, 1992, p. 2)

This definition or its equivalent is a common one in the literature and appears to be based on the colloquial usage of describing events as having low or high risk. Where this definition has been used, it is often the case that actual probabilities are attached to events and described as their "risks". So, for example, Friedlob and Schleifer (1999) attach probability values to three different types of audit risk which they describe as "risks". They manipulate them as probabilities, for example, by multiplying them together in order to obtain an overall measure of risk.

Risk can also be defined as “a measure of the anticipated difference between expectation and reality” (Essinger and Rosen, 1991). This is often interpreted as risk being a measure of *uncertainty*. Indeed, having identified risk with probability, Friedlob and Schleifer (1999) proceed to identify risk with uncertainty:

“As heads is the opposite of tails in the flip of a coin, risk is the opposite of certainty, and certainty the opposite of uncertainty. Risk... is the logical synonym of uncertainty. Risk is uncertainty” (p. 127)

The mathematical response is to model uncertain situations with abstract constructs such as stochastic processes. Predictions from such theories are very useful in such areas as actuarial calculations and financial mathematics but appear to have limited applicability elsewhere.

In the context of financial mathematics, risk has been interpreted as the degree of variability in returns on investment. This way of looking at risk captures both the probabilistic nature of risk and the element of uncertainty. However, it is a specialised measure that is rarely used outside the discipline.

In a number of contexts, the word "risk" is taken to refer to a complex concept combining the probability of an event and its likely consequences. So, for example, the Strategy Unit (2002) report for the Cabinet Office on risk management takes the following definition:

“Risk refers to uncertainty of outcome, whether positive opportunity or negative threat, of actions and events. It is the combination of likelihood and impact, including perceived importance” (p. 7)

This approach combines the other three types of meanings into one. In the literature it is often the *implied* meaning of risk, even when a statement has been made that suggests one of the narrower meanings discussed above.

## Risk management paradigms

The literature appears to present a wide range of differing discourses about the management of risk. However, the Royal Society Study Group on risk management (Royal Society, 1992) discerned two distinct paradigms which they called “homeostatic” and “collibrational”. Smallman (1996) usefully simplified this terminology to “reactive” and “proactive”.

Reactive approaches to risk management are characterised by the setting of targets associated with risk performance indicators and incorporating controls into organisational design. Typically, these will take the form of quantified decision rules (e.g. credit scoring in the financial sector). The management process requires anticipation and quantification of risk and focuses on the specification of outcomes rather than processes.

Smallman (1996) has developed a research model for examining the risk behaviour of organisations. He is very critical of the predominantly reactive approach taken to risk management:

“... it is still the case that most organizations rely largely on risk retention (accepting loss) and risk transfer (hoping that some other institution will bear the loss) as their principal means of ‘risk management’. This is a fatalistic approach that accepts ‘if things can go wrong they will’ as a principle of business. This is not management; it is allegiance to ‘Murphy’s law’.” (p. 14).

The reactive or “homeostatic” approach to risk management suffers from a weakness that follows from the “risk homeostasis theory” of Wilde (1982). According to this theory individuals constantly balance possible risks against potential gains. This is a subconscious cost benefit analysis in which an individual’s level of acceptable risk is a qualitative issue determined by factors such as personality, role, economic circumstances, peer group pressure and cultural background. An important implication of the theory is that a perceived increase in safety can reduce the risk attributed to a hazard thereby increasing risk-taking behaviour associated with that hazard.

The theory is considered controversial and there have been several attempts to discredit its predictions. However, there is a body of experimental evidence to support the theory (Trankle and Gelau, 1992, for example). A modified version of the theory, “risk compensation theory”, takes the view that there is not complete homeostasis between risk-taking and

rewards but that “individual risk-taking decisions represent a balancing act in which perceptions of risk are weighed against propensity to take risks” (Adams, 1995, p. 15)

Examining the evidence for risk compensation by a group of road safety experts from 16 different counties, Adams concluded that such controversy as remains now centres on “the interpretation of what causes it, and how complete it is, not on whether it occurs” (Adams, 1993, p. 55).

Proactive approaches to the management of risk are strongly advocated by key authors in the field. The Cullen Report, in particular, drew this as the key lesson from the enquiry into the Piper Alpha disaster (Cullen, 1990). However, according to the Royal Society (1992) what makes an approach “proactive” is not so much a matter of the character of the processes involved as the organisational culture within which they operate.

The literature on proactive approaches to risk management in practice, however, appears to be limited to theories of the form that “holistic” approaches might take. So, for example, Smallman (1996, p. 14) offers a three-element model of holistic risk management that combines data collection and collation, forecasting and organisational learning.

## Risk assessment

“Engineers, scientists, academics and others involved in studying the uncertain business of risk employ terminology which is itself marked by some uncertainty. Expressions such as “risk assessment”, “risk evaluation” and “risk analysis” are used in a somewhat interchangeable way to describe a variety of the techniques and processes involved in the overall management of risk.” (Frosdick, 1997, p. 165)

Despite this lack of clarity, Frosdick and other writers (e.g. Mobey and Parker, 2002) consistently use the term “risk assessment” as a catch-all to include all those activities that are needed before appropriate risk reduction methods can be decided upon.

Risk identification is problematic: if a risk is not identified in the first place then its mitigation can only be the unintended outcome of some other activity. Resources at risk can be physical, human or intangible (e.g. finances or reputation). Williams *et al* (1998) identify the following seven “environments” in which resources could be at risk:

**Physical:** Physical resources are at risk in the physical environment.

**Social:** The state of local society, human values and beliefs about behaviours as well as the culture of the organisation are all sources of risk.

**Political:** The political environment can have significant impact on an organisation. It can be a source of uncertainty and instability or it can present opportunities (e.g. subsidies for certain kinds of investment)

**Operational:** The day-to-day operational activities of an organisation create risk and uncertainty. Dangerous working conditions can harm employees; poor waste management can harm the environment; switching from an old service to a new one can bring increased profit – or significant losses.

**Economic:** The economic environment can benefit or harm the organisation: changes in interest rates, taxation or exchange rates, for example, are all sources of risk.

**Legal:** The constantly changing regulatory environment creates risk and uncertainty, especially to the public sector.

**Cognitive:** The knowledge, understanding and competencies of managers and other employees are not perfect. In particular, there is significant source of risk in the differences between people’s perceptions of reality.

A simpler but more memorable classification of risk environments is offered by Shrivastava *et al* (1988):

- **HOT** (human, organisational and technological) risks. These are *direct* sources of risk and correspond roughly to cognitive, social, operational and physical sources of risk in the Williams *et al* list.
- **RIP** (regulatory, infrastructural and political) risks. These tend to be *indirect* sources of risk and correspond roughly to legal, economic and political sources of risk in the Williams *et al* list.

## Psychology of risk perception and cultural theory

Risk homeostasis and compensation are essentially psychological theories of risk perception that focus on personal factors in risk-related decisions. This implies that risk perception is susceptible to "scientific" treatment through the use of psychometric instruments and theories of psychological types (see, for example, Slovic *et al*, 1986).

An important contribution of the psychological approach is to draw attention to factors that affect people's perception of risk. The Health and Safety Executive (1999) has published a comprehensive review of literature pertaining to risk perception. Four of the main themes they identify are:

- The level of control that an individual or group has over exposure to risk is an important factor in determining their response to that risk;
- Willingness to take risks increases with how far in the future the consequences are likely to be felt;
- More familiar risks are treated as of lesser potential impact and probability than less familiar ones;
- People's conceptualisation of a risk and the manner in which information about the risk is presented can affect their response to the risk ("framing effects")

The psychological approach was rejected by the cultural theory of Douglas and Wildavsky (1982). They argued that the subjective perception of risk by individuals was a value laden social construction of reality. This view was strongly supported by the Royal Society Study Group (Royal Society, 1992), who considered that cultural theory had revolutionary implications for risk assessment and risk perception:

"...one of the major challenges to orthodox psychological approaches to risk perception over the past ten years has come from...cultural theory...it implies that people select certain risks for attention to defend their preferred lifestyles and as a forensic resource to place blame on other groups." (p. 112).

Douglas (1990) criticises the approaches of both engineers and psychologists to risk assessment for their scientific reductionism. However, Schrader-Frechette (1991) considers the cultural theorists just as guilty of reductionism since their emphasis on value judgements reduces risk perception to "pure sociology". She offers an approach described as "scientific proceduralism", which attempts to be a middle way between scientific and cultural models. Unfortunately, it is very time-consuming and only likely to be useful for very significant areas of risk.

Douglas and Wildavsky established the cultural theory of risk perception but they did not offer an alternative model of risk management. Other writers, however, have attempted to develop models of risk management that take account of cultural theory. For example, Miles and Snow (1984) suggest that organisations fall into four main types of approach to business risk:

- **Analysers** prefer a proactive approach. They tend to engage in broad environmental scanning, and balance their limited adaptability with their stability and risk averseness
- **Prospectors** prefer a less proactive approach. They too engage in broad environmental scanning but are more adaptable. However, they can rush in to costly failures without considering all risks
- **Defenders** prefer a reactive approach. They tend not to carry out environmental scanning of any sort, and are therefore prone to risks they may not be able to foresee.

They will tend to have a narrow set of well-identified and well-researched risks with which they are familiar.

- **Reactors** are fatalistic. They tend not to look ahead. They are inconsistent and can react to risks inappropriately

Smallman (1996) identified these four types as occupying positions on a spectrum ranging from a fatalistic approach to risk (reactors) to a holistic approach (analysers) with defenders tending towards the fatalistic and prospectors towards the holistic. He suggests that recognising roughly where an organisation's culture is located on this spectrum provides a useful starting point for the critique of its approach to risk evaluation.

## Risk management in the public sector

There appears to be very little in the literature that describes studies that focus specifically on risk management in the public sector and what there is tends to be highly sector specific. Dowlen (1995) suggests that private sector models of risk management as adopted by the public sector may be inappropriate. She points out that:

"There is very little evidence of what constitutes acceptable risk taking in the public sector, beyond the assertion that it is acceptable if it succeeds. This suggests that there must be a search within the public sector for appropriate models, and that a climate conducive to learning is critical" (p. 20)

There is, however, a substantial body of guidance literature for risk management in the public sector in general and further and higher education in particular. The JISC, for example, have provided a toolkit at <http://www.jiscinfonet.ac.uk/InfoKits/risk-management>. Such guidance provides useful procedural advice but generally avoids raising the issue of risk perception or the implications of cultural theory. Unfortunately, between them, these two theoretical perspectives succeed in casting serious doubt on the rationality of the instrumental processes described in the guidance. In the context of the complex human interactions that characterise further and higher education they need to be taken seriously if risk management is to make any sense.

The Strategy Unit's report for the Cabinet Office (2002) emphasises this complexity:

"The language of risk management sometimes implies a neater process than is usually possible in reality. This is particularly the case in government. Governments have to deal with a more complex operating environment, with more variables and a greater impact from subjective perceptions than other fields like business. They also have to balance conflicting viewpoints. Handling risk involves values in their widest sense as well as value in a narrower sense." (p. 7)

## Risk management of e-learning projects in HE

There is a significant body of literature dealing with the management of risk in IT projects. IT development is seen as a very high-risk activity and although the literature tends to focus on technical matters, there is a clear recognition that human and cultural issues are key causal factors. In a recent study in Western Australia, Baccarini *et al* (2004) identified 27 key risks for IT projects. Of these only three were technical in character. The top five risks identified, in decreasing order of importance, were:

- Insufficient human resources
- Unrealistic schedule and budget
- Unrealistic expectations
- Incomplete requirements
- Diminished window of opportunity owing to late delivery of software

Interestingly, the main conclusion of the study was that good project management was the most effective technique for dealing with risks in IT projects.

There appears to be very little published specifically about the risks associated with e-learning. Coen *et al* (2004) report on a JISC-funded project to assess the risks associated with e-Learning investments in FE and HE. They provide a useful framework for senior managers and others within institutions to assess the risks associated with e-learning investments. It deals with six inter-related issues:

- The external environment;
- Strategies for e-learning;
- The way staff are prepared and deployed;
- Organisational structures;
- Management processes and
- The nature of the technology itself.

Their concern, however, is more with the strategic and operational management of change associated with introducing new e-learning technology than with assessing the risks of a particular e-learning development initiative.

Institutional understandings of what projects are about, the opportunities they provide, their limitations and how they contribute to institutional objectives cannot be taken for granted. Lockett (2004) provides a useful overview highlighting some of the common theories used when implementing change and uses practical activities to embed these theories. This white paper also introduces mechanisms for influencing the project environment – including stakeholders in partner institutions - by creating a (positive) climate for change.

Opposition to change is also a major theme in the white paper *Change management and e-learning*<sup>14</sup> available from the Epic Group. It argues that cultural resistance and cultural inertia are the biggest obstacles to the implementation of e-learning and presents a method for change management, relating it to the implementation of blended and e-learning with practical advice and checklists for implementation.

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<sup>14</sup> Available for free via [http://www.epic.co.uk/content/resources/white\\_papers/change\\_update.htm](http://www.epic.co.uk/content/resources/white_papers/change_update.htm)

## References

- Adams, J.G.U. (1993) "Risk compensation and the problem of measuring children's independent mobility and safety on the roads", in Hillman, M. (Ed.) (1993), *Children, Transport and the Quality of Life*, London: Policy Studies Institute,
- Adams, J.G.U. (1995) *Risk*, London: UCL Press
- Ayers, E.L. (2004) "The Academic Culture and the IT Culture: Their Effect on Teaching and Scholarship", *EDUCAUSE Review*, Vol. 39, No. 6, pp. 48–62.
- Baccarini, D., Salm, G., Love, P.E.D. (2004) "Management of risks in information technology projects" *Industrial Management & Data Systems* Vol. 104, No. 4, pp. 286-295
- Coen, M., Breslin, C., Nicol, D. and Howell, D. (2004) *A Framework for Managing the Risks of E-learning Investment*, University of Strathclyde:  
<http://www.predict.strath.ac.uk/projects/risk/documents/framework.pdf> [Accessed 10 May 2005]
- Cutter, S. (1993) *Living with Risk: Geography of Technological Hazards*, London: Edward Arnold
- Douglas, M. (1990), "Risk as a forensic resource", *Daedalus*, Vol. 119, No. 4, pp. 1-17.
- Douglas M. (1992) *Risk and Blame: Essays in Cultural Theory* London: Routledge, 1992
- Douglas, M. and Wildavsky, A. (1982) *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers*, Berkeley, CA: University of California
- Dowlen, A. (1995) "Learning to manage risk in public services" *Executive Development* Vol. 8 No. 2, pp. 19-24
- Essinger, J. and Rosen, J. (1991) *Using technology for risk management*. Woodhead-Faulkner
- Fischhoff, B., Hohenemser, C., Kasperson, R.E. and Kates, R.W. (1978), "Handling hazards" *Environment* Vol. 20, No. 7, pp. 16-37
- Friedlob, G.T. and Schleifer, L.L.F. (1999) "Fuzzy logic: application for audit risk and uncertainty" *Managerial Auditing Journal*, Vol. 14, No. 3, pp. 127-135
- Frosdick, S (1997), "The techniques of risk analysis are insufficient in themselves" *Disaster Prevention and Management* Vol. 6, No. 3, pp. 165-177
- Fuller, C. (2000) "Modelling continuous improvement and benchmarking processes through the use of benefit curves" *Benchmarking: An International Journal* Vol. 7, No. 1, pp. 35-51
- Granot, H. (1998) "The human factor in industrial disaster" *Disaster Prevention and Management* Vol. 7, No. 2, pp. 92-102
- Larkin, J. (2002) *Strategic Reputation Risk Management* Palgrave MacMillan
- Lockitt, B. (2004) *Change Management*. Occasional paper from 3T available online at <http://nt6139.vs.netbenefit.co.uk/pdf/CHANGEMANAGEMENT3t.pdf>. [Accessed 10 May 2005]
- Mobey, A. and Parker, D. (2002) "Risk evaluation and its importance to project implementation" *Work Study* Vol. 51, No. 4, pp. 202-206
- Royal Society, The (1992) *Risk: Analysis, Perception and Management, Report of a Royal Society Study Group*, London: The Royal Society
- Schrader-Frechette, K. (1991), "Reductionist approaches to risk" in Mayo, D. and Hollander, R. (Eds), *Acceptable Evidence: Science and Values in Risk Management*, Oxford: Oxford University Press pp. 218-48.

- Shrivastava, P., Mitroff, I.I., Miller, D. and Miglani, A., (1988) "Understanding industrial crises", *Journal of Management Studies*, Vol. 25, No. 4, pp. 283-303.
- Slovic, P. (1987) "Perception of Risk", *Science* Vol. 236
- Slovic, P., Fischhoff, B. and Lichtenstein, S. (1986) "The psychometric study of risk perception", in Covello, V.T., Menkes, J. and Mumpower, J. (Eds.), *Risk Evaluation and Management*, New York: Plenum Press
- Smallman, C. (1996) "Risk and organizational behaviour: a research model", *Disaster Prevention and Management*, Vol. 5, No. 2, pp. 12-26
- Starr, C. (1972) "Benefit-cost studies in socio-technical systems", in *Perspectives on Benefit-Risk Decision Making*, Washington, DC: National Academy of Engineering
- Strategy Unit (2002) *Risk: Improving government's capability to handle risk and uncertainty* London: Cabinet Office
- Trankle, U.G. and Gelau, C. (1992) "Maximization of subjective expected utility or risk control? Experimental tests of risk homeostasis theory", *Ergonomics*, Vol. 35, No. 1, pp. 7-23
- Wilde G. (1982), "The theory of risk homeostasis: implications for safety and health", *Risk Analysis*, Vol. 2, No. 4, pp. 209-25.
- Williams, C.A., Smith, M.I. and Young, P.C. (1998), *Risk Management and Insurance*, London: Irwin McGraw Hill