

SECTION TWO: THE 'TOOLKIT'



A GUIDE TO VIRTUAL EDUCATION COURSE DESIGN AND DELIVERY

Designing and delivering virtual education courses is no simple task, but rewards can far outweigh effort.

If well done, virtual education can provide many more people, who might not otherwise have the opportunity, with the chance to experience high quality learning; if done badly it can frustrate students, sabotage the attainment of educational goals, and detract from an organization's reputation.

In order to gain from the experience of those who have successfully designed and delivered virtual education courses (as well as profit from their mistakes), we have designed a Guide for those aiming to design and deliver virtual education in the future. The Guide sets out the stages of the process and provides details of the issues and questions that will face educational decision makers at each step.

There are six essential stages in the process:

- **Pre-Design Stage**
This is the stage for deciding on the aims of the course(s)
- **Pedagogical Design Stage**
At this stage the content of the course(s) is decided.
- **Delivery Design Stage**
Now come the decisions about teaching methods and technology tools.
- **Implementation Stage**
This is when the course(s) come into action and the processes for this need to have been anticipated.
- **Evaluation Stage**
Information about the relative success/failure of the course(s) is presented and first modification is made.
- **Maintenance Stage**
Further Course iterations are delivered and further modified for continuing improvement.

There are four basic sets of design issues:

- **Organizational**
These issues deal with the interests of the organization
- **Pedagogical**
These issues may centre round:
academic considerations
educational considerations
and deal with the interests of teachers and taught
- **Technological**
These will include issues that are both intrinsic to technology itself and extrinsic factors (meaning the context in which the technology will be used)
- **Evaluative**
These issues will relate to how the course(s) will be assessed.

These Design Stages and Decision Issues are outlined at each stage in the following pages, followed by a detailed examination of each stage and the issues that need to be considered and resolved.

While some of the stages and the issues discussed may be self-evident to decision makers in many institutions, they are included here for the benefit of those who may be coming to this type of venture for the first time.

The Guide does not presume to tell decision makers how to set policy for their organization, but it does systematically explore the relevant decision making for this area and make some recommendations. We hope this will prevent what has happened in the past - exciting virtual education courses failing to meet their potential for lack of experience or sufficient attention to detail.

The Guide does NOT recommend specific technologies - they come and go too fast - but outlines the features they should contain to achieve educational goals.

The specific questions posed in the Guide are designed to be applicable to *any* virtual course. They are therefore focussed on *one* course. This course may or may not be part of a larger program of study or training, such as a professional certification, a diploma or degree course.

If the course is an isolated occurrence, and there may be good reasons (such as experimentation) why this should be so, some recommendations that involve looking at possible changes in the organizational culture or infrastructure will be less appropriate. A single course or even a collection of isolated courses could not by themselves sustain a whole culture or infrastructure.

Nonetheless, the design and delivery of virtual courses may provide organizations with the chance (or excuse) to revisit existing practices and procedures to see if they are a help or a hindrance in achieving organizational goals within the new educational paradigm that is emerging.

**“It is generally agreed that technology plays only a small
part in the ultimate success of a programme.
The corollary to this is that no one technology will be
THE solution.”**

*Dr Robin Mason,
Head of the Centre for Information Technology,
Institute of Educational Technology,
The Open University*

THE PRE-DESIGN STAGE

Why is the organization getting into Virtual Education and what are the objectives of the proposed virtual education course(s)?

Is it part of a strategic plan for VE or is it purely experimental?

ORGANIZATIONAL ISSUES	Market Research Organizational Culture Image Course Modes Costs Course Team Composition
PEDAGOGICAL ISSUES A) ACADEMIC	Academic Quality Faculty Expertise Career & Image Global Accreditation Rewards for Risk
B) EDUCATIONAL	Market Demand Desired Modes Student Expertise
TECHNOLOGICAL ISSUES	Involvement Faculty Training
EVALUATIVE ISSUES	Formative/Summative Evaluation Brief

Market Research

Issues:

- What market is the course aimed at?
- What are the characteristics of that market?
- Can the same course be offered to different markets at the same time?

Options:

- Off site students - certificate/degree programs
- Off and on site students - certificate/degree programs
- Off site students - professional courses
- Off and on site students - professional courses

Comment:

Many post-secondary institutions are faced with a static market for conventional undergraduate students, at the same time as shrinking budgets, and need to expand into other educational markets. This may include off-campus undergraduate students or an increase in the focus on continuing education students.

At the same time, corporations are seeking more cost-effective ways to deliver in-service training. An obvious way to decrease costs is to deliver each course to more students.

One problem for colleges and universities may be the mix of students in one course - especially if student teamwork will be involved. Adult students have very different responsibilities and available time slots from conventional undergraduates. They are also likely to have different levels and types of technological expertise.

The bottom line is that course designers need to know the characteristics of the target market(s) in some detail. This will require some resources being allocated to market research.

Recommendation:

Undertake some detailed market research to understand the exact nature of the educational demand that the organization could supply.

Organizational Culture

Issues:

- Can your organization react quickly to change?
- Does it favour sharing or monopolizing knowledge?
- Does the organization have a powerful champion of virtual education?
- Will virtual education be accepted as part of the organization's strategic plan or seen as an experimental ad hoc arrangement?

Options:

- *The organization is conservative*, with no champion of virtual education, its faculty are more interested in monopolizing knowledge and its foray into virtual education is an unwilling, ad hoc experiment
- *The organization is innovative*, with a powerful champion of virtual education, its faculty are interested in leveraging the value of knowledge through sharing, and virtual education is part of a comprehensive plan
- *The organization is split*, and contains substantial elements of both cultures.

Comment:

If the organization is mainly conservative and is being forced unwillingly into VE by competitive pressures the chances of success are not good.

If the organization is more innovative the chances of success increase. In today's educational market a fast and flexible response is essential and the organization must be prepared for this.

Recommendation:

Take a realistic look at your organization's dominant culture. If it is mainly anti-change, think hard before attempting VE course delivery.

If individual academics are already experimenting, consider providing rewards for their risk - this will send a fast message to others less innovative.

Image

Issue:

- What sort of image is the organization aiming to convey?

Options:

- Rely on existing image to “sell” the course
- Build on existing image by providing a virtual course
- Project new image by developing a virtual course

Comment:

Research shows that the public rates post-secondary institutions largely (but not entirely) by the length of their existence. Every country has its “league table” of universities and colleges. While this may be inaccurate and unfair, it is a factor that has to be taken into account. Delivering virtual courses presents an opportunity to change or enhance the image of the organization. This is also true of commercial organizations.

Recommendations:

If your organization is near the bottom of the national league, there is little to be lost by going for a new leading edge image associated with the use of the newest technologies, and using this as a selling point for new courses. If the new image is to stick, the technology used in the course will have to operate at a high level of efficiency.

If your organization has an existing image that is already associated with new technology, new courses can build on that image. With your image on the line, the course technology will have to operate at the highest level of efficiency and effectiveness.

If your organization is at the top of the league, the choice is to rely on that reputation to sell the new courses or to build on the existing image of excellence by adding a new “leading edge” reputation. If your course technology does not operate efficiently, your reputation for academic excellence may see you through, but not for very long. Any subsequent courses will need to function with technological precision if you want to stay at the top.

Course Modes

Issue:

What type of course is anticipated?

Options:

- Stand alone small module/unit
- Module/unit as part of an unaccredited course of study for corporate purposes
- Module/unit as part of an accredited course of study for a professional qualification
- Module/unit as part of an accredited certificate/diploma
- Module/unit as part of an accredited undergraduate degree program
- Module/unit as part of an accredited masters level degree program
- Module/unit as part of an accredited doctoral program of study

Comment:

Even if the decision about the course as part of a larger program is subsequently changed (and there are advantages in being flexible), it is important for a provisional decision to be made about the course mode very early in the decision making process because it affects so many other decisions.

The 'organization' in question may not be a single educational institution but any one of a number of organizational set ups that have been outlined in Dr Mason's paper earlier in this Report. It will certainly be even more essential, if this is the case, to make this type of decision before any others can be made.

It is important to remember that continuing students are your biggest potential for new/increased markets, and they have very different conditions for study. Thinking beyond the mindset of campus-based course modes is essential.

Recommendation:

Think micro-modular - this has big implications for marketability of courses (more of this later.....).

Costs

Issues:

- How will the course be costed?
- Will it be compared to conventional courses?
- Will the comparison be valid?

Options:

- Use existing methods of costing
- Set up new methods for costing virtual courses
- Set up new method for costing all courses

Comment:

It is obviously important to have accurate costings in order to determine the break even point of new courses. It is also important to know how many students will be needed to make a course cost-effective to mount.

The main problem is that conventional courses have large components of hidden and sunk costs, whereas virtual courses have very obvious expense lines. This makes determining costs for a “dual mode” course extremely difficult unless new costing methods are adopted.

The distinction between fixed and variable costs becomes highly significant when virtual courses are being costed, and not only because they rely on large student numbers for cost-effectiveness; they may also have a longer shelf-life.

There are studies that have demonstrated that a distanced student can obtain a degree at quarter of the cost for a campus-based student. There are other studies to show that virtual courses are more expensive to develop but more economic to deliver than conventional courses. All these studies have very complicated assumptions that are open to debate.

Recommendation:

Take a good look at the way the organization currently costs its courses and decide if it needs more accurate systems for course design and delivery decision making.

Course Team Composition

Issues:

- What course team(s) should the organization set up to design and deliver the courses?

Options:

- If the organization is serious about Virtual Education, it will need to establish course teams
- If the organization is only experimenting with VE it may get away without course teams but it would still be better to go that route.

Comment:

The composition of course teams will depend partly on the technologies used. In addition there may be a need for specialist members such as market researchers and print buyers.

The composition will need to change over the design, delivery and maintenance stages. A table is provided overleaf of possible roles and tasks for course teams at the various stages of the process.

While not every role will necessarily require a separate person (for example, an academic may also be able to act as an educational technologist), it will be important to have enough people to cover the range of activities. This also relates to the costing of courses.

Recommendations:

Decide early on who is going to be involved and why, and assign clear roles and reporting procedures.

<i>Design Team Role</i>	<i>Activity</i>
<i>Academic Content</i>	Research and organization of content
<i>Educational Technology</i>	Learning structure of course/ assessment procedures
<i>Technology & Media</i>	Development of delivery mechanisms
<i>Production</i>	Plan production schedules
<i>Financial Planning</i>	Cost projections/budgeting
<i>Administration</i>	Plan administration of proposed delivery methods
<i>Market Research</i>	Provide feedback on market conditions
<i>Coordination/ Communications</i>	Process communications and requirements of team
<i>Evaluator</i>	Provide evaluation model

<i>Delivery Team Role</i>	<i>Activity</i>
Academic Delivery	Interaction with students (on-line/broadcast etc)
Academic Assessment	Assessment procedures
Educational Technology	Monitor assessment/standards
Production	Print/broadcast/on-line production
Technology	Provide technical support
Administration	Registration/financial organization/processing
Coordination/ Communications	Communications/reports/ records
Evaluator	Conduct evaluation

<i>Maintenance Team Role</i>	<i>Activity</i>
Academic Support/ Revision	Revisions to content/ educational student support
Technology Review	Technology troubleshooting
Ed. Tech. Review	Assessment problems/monitor assessment process
Administration	Administration of student support services Administration of course maintenance
Coordination/ Communications	Team communications and reports
Evaluator	Ongoing evaluation

Academic Quality

Issues:

- What academic level will the course be designed for?
- Will it be mandatory or elective?
- How will 'quality' be defined?

Options:

- At prerequisite level (mandatory or elective)
- Introductory level (mandatory or elective)
- Intermediate levels (mandatory or elective)
- Final level (mandatory or elective)
- Special level (as agreed with industry)
- Experimental (by invitation)

Comment:

The quality aimed at will be increasingly influenced not only by the organization's academic reputation but also the market demand for that particular quality of "product".

Students are increasingly motivated by the relevance of the course in the workplace, as well as the organization's reputation. Courses that may be deemed academically 'rigorous' may or may not be seen as relevant in today's economy and therefore not of the desired quality for that reason. Evidence of this is the stream of graduate students taking courses at community colleges, some of whom have acquired worldwide reputations for very high quality 'training'. These may be in specialized fields that do not carry an academic caché but nevertheless allow the college to select only the very brightest students.

Experimental courses may be worth considering. They can be used to test a course on students who are invited to participate at free or special rates. They will be more forgiving of technical hitches and can become very loyal advocates of the organization in other arenas.

Recommendations:

Give consideration to rethinking what is meant by quality and the status of 'applied' courses.

Faculty Expertise

Issues:

- What academic expertise will be needed?

Options:

- Use existing academic staff
- Bring in new academic staff
- Re-train existing academic staff

Comment:

Organizations sometimes have the required expertise in-house to design and deliver new courses. Well-known academics with a worldwide or national reputation can be a big draw, and worth building courses around if the student demand is also there.

On the other hand, some courses may require bringing in new expertise, either from the corporate sector to the educational sector or vice versa. It may also be possible to share academic expertise across organizations, depending on any macro-structure that the organization is part of.

Re-training existing staff is another option that may be more cost-effective in the longer term, as this provides academic staff with the opportunity to acquire new knowledge and skills, which are then at the disposal of the organization. All too often in academia, continued training is usually considered a decision of the faculty members themselves, and faculty are expected to keep themselves up to date in their own discipline. More organizational support and encouragement could profitably be shown to those who are willing to learn a new discipline or body of knowledge.

Recommendations:

Assess the need for additional expertise early in the decision making process. Go for well known experts if this is at all possible - this is a chance to use an organization's academic 'stars' to the utmost.

Career & Image

Issue:

- Will the new course enhance the academic careers and the image of the academic staff in the organization?

Options:

- Academic staff may be *anxious to be involved* in virtual courses as a career advancement and new image opportunity.
- Academic staff may be *encouraged to become involved* by career advancement opportunities and the possibility of creating a new image.
- Academic staff may be very happy with their existing image and *avoid becoming involved* as too risky for their career advancement.

Comment:

The organization needs to be aware how enthusiastic (or otherwise) its academic staff is about becoming involved with virtual course design and delivery. While some may be well ahead of their organization and already using new technologies in their existing courses, others will feel threatened by new technology.

The organization may need to consider its overall policy towards new technology training for its academic staff. There are likely to be some organizations with existing contractual arrangements that allow staff to opt out of any such projects. There may also be agreements that make it difficult or impossible to bring in new academic staff willing to undertake virtual course design and delivery.

Recommendation:

All these potential problems need to be dealt with BEFORE course design gets under way.

Point out the career opportunities presented by the new courses to attract innovative and enthusiastic faculty.

Global Accreditation

Issues:

- Will any faculty need accreditation in external jurisdictions to deliver the proposed courses in global markets?

Options:

- If you want to be safe, this is something that has to be researched thoroughly at the earliest opportunity. If VE is part of the organization's overall strategy, this research needs to explore all the possibilities that may apply to later courses.

Comment:

This has emerged as a problem in several institutions that have tried to deliver their courses in other states or provinces, let alone in foreign jurisdictions.

The problem is also associated with student accreditation. There is nothing to stop students who want to access your course from abroad or from other provinces, but the market can dry up as soon as they realise they cannot use any of your qualifications in their own bailiwick.

Recommendations:

Research the situation of faculty accreditation in all jurisdictions in which you expect to deliver courses as soon as possible.

Rewards for Risk

Issues:

- Why should faculty risk their time and reputation on designing and delivering VE courses?

Options:

- Provide incentives

Comment:

In today's climate of rapid and continual change, organizations need people who are willing to risk trying new things.

If the organization needs to increase the percentage of those willing to take risks, then it will have to find ways to provide the risk takers with rewards to encourage more people to get involved.

Recommendations:

Increase their:

Recognition

Status

Money

or any combination of these three.

Market Demand

Issues:

- What sort of courses do students actually want?
- Is the organization flexible enough to meet the demand?

Options:

- Undertake detailed market research and design/deliver courses that match the requirements of the market
- Adapt existing courses to the virtual mode and hope that the match is sufficient

Comment:

Having decided to undertake more market research the organization now needs to apply its findings. Educational institutions are geared to satisfying the demands of the conventional undergraduate market. They now have to adapt not only to a different type of student but also to a different geographic spread.

Both of these pressures will force institutions into more flexible mind sets. Traditional semesters, course lengths, course timetables, are but a few of the arrangements that will have to adapt. In short, the institution will need to tailor its courses to the conditions of the lifelong learning context as well to conventional campus-based delivery, and the two will be very different.

One basic difference between campus-based, full-time students and most others is that the time available for study comes in very much shorter time slots. Instead of thinking in months and years, organizations will have to think in days and weeks.

A big advantage of designing micro-modular components of courses is that these can be sold separately at prices that can allow the student to pay-as-you-go. This may well catch on with undergraduates as well. This is one way in which Virtual Education could effect systemic changes in campus-based educational delivery!

Recommendation:

Think micro-modular (remember issues on page 139)

Desired Modes

Issues:

- What types of courses are students looking for?

Options:

- Short units/modules to fill in knowledge/skills gaps
- Certificate courses that will provide a professional qualification of some description
- Degree courses that will provide an academic qualification

Comment:

At the moment it is difficult for students to take control of their own learning paths. If they require any type of accreditation they must adhere to the institution's requirements and prerequisites. While prior learning recognition is established in many provinces, it is not generally transferable between institutions as it is in some other countries.

This situation may change as virtual education provides the opportunity for students to cross national educational boundaries in seeking to fill educational gaps in their knowledge or skills repertoire.

This means that educational organizations can be both threatened and enhanced. As 'multinational' educational organizations encroach on national markets, so individual or cross-organizational bodies can seek new opportunities in overseas educational markets by designing and delivering virtual courses.

Recommendations:

Be flexible in the type of course you are willing to offer. Be prepared to work with industry in providing short VE courses that fill career knowledge and skills gaps. Consider giving non-credit, or professional courses that are not already part of an accredited program, a special type of accreditation that might later be transferable into Certificates and Degrees.

Student Expertise

Issues:

- What expertise will learners need to be able to take the course?
- Does the average learner in the target market possess that expertise?

Options:

- Design and deliver courses that only demand the expertise that potential students possess
- Design and deliver courses that require potential students to acquire the requisite expertise by themselves
- Design and deliver courses that provide training in the necessary expertise as well as designing and delivering the intended course.

Comment:

Waiting until students possess the required skills is not really an option because it places the organization in too reactive a position in the educational market.

At the least, the organization needs to be researching the requisite skill levels of its potential markets, and have courses ready designed to deliver at short notice as they become viable.

The optimum position is to make a virtue out of a necessity and provide courses that give students the required skills - either as a stand alone course or as a prerequisite.

Recommendation:

Make sure that your market research looks specifically at the current technical expertise of your potential VE student market.

Involvement

Issues:

- How soon does the organization want to involve technologists in the design process?

Options:

- Make all the organizational and pedagogic decisions BEFORE involving any technologists
- Involve technologists from the very beginning

Comment:

There are pros and cons here that will differ from institution to institution.

The arguments in favour of involving technologists from the beginning centre round the fact that they will get a better understanding of all the non-technological issues before they are asked to recommend specific technologies.

The counter arguments are mainly concerned with the undue influence they may have on non-technological decisions. This will likely vary considerably in each institution, depending on such factors as the technological skills level of academics and administrators, as well as the relative status that technologists have versus academics in the politics of the organization.

The structure of the course team at each stage of the design and delivery process will be affected by this basic decision and so may the ultimate success of the course.

Recommendation:

Be brave and involve them but don't let them talk in acronyms!

Faculty & Administrative Training

Issues:

Is the academic faculty and administration ready to deliver and administer Virtual Education courses?

Options:

- Try and train them as necessary as you go along
- Set up a systematic program of training

Comment:

Technology in VE is constantly changing so it is unlikely that a faculty and administration will be sufficiently trained for VE delivery.

In addition, the same technology can be relevant to updating general administrative procedures, and can save costs in this area.

The only problem may be in persuading the faculty to buy in to the training program. We have already discussed rewards for taking career risks - perhaps training in new technology should count as risk taking!

Recommendations:

Build it and they will come! You may as well set up the training program - it at least gets your technologists mixing with your academics!

Formative or Summative Evaluation

Issues:

- Will the evaluation be formative or summative in nature?
- Will the evaluation be in-house or external?

Options:

- Formative-internal evaluation
- Formative-external evaluation
- Summative-internal evaluation
- Summative-external evaluation

Comment:

In a fast changing world ongoing evaluation of courses is as essential as student services. Decision makers need ongoing access to accurate information about the courses, and teachers and technologists need honest feedback in order to correct any evolving problems.

A decision needs to be made at the outset on what form of evaluation the organization will use. The arguments for and against the four options are fairly obvious.

External evaluation will be less influenced by loyalty considerations, and may be no more expensive than using internal resources whose time must be costed to the course project. Internal evaluators can be put in very difficult situations if the course is not going as well as expected, especially if they serve other functions on a course team, which is not unknown to occur. While the truth can be painful, blissful ignorance can be even more so in the longer term.

Formative evaluation that takes place as the course is designed and delivered is the most valuable, and allows corrections to occur in a timely fashion before problems become too entrenched. Summative evaluation may be less costly in staff time or contract costs but will be of less value.

Recommendation:

Go for formative external evaluation - it lends credence to the course with students and employers

Evaluation Brief

Issues:

- What approach to evaluation will be adopted?

Options:

- Leave it entirely to the evaluator
- Take a more hands on approach

Comment:

The advantage of leaving it to the evaluator, if you are confident that you have a good one, is that there is no question that you are trying to influence their objectivity about the course. It is possible that restricting access to certain organizational personnel, for example, may be considered interference with the evaluator's ability to present a truly objective report.

The advantages of taking a more hands on approach are that it is easier to set up reporting procedures and you know that all the bases you want covered will be addressed.

Recommendations:

Be hands on at the beginning. Set up clear reporting procedures, make sure the evaluation model meets your needs and then leave the evaluator to get on with the job. A good and objective evaluation can be worth a lot in terms of your marketing strategy.

PEDAGOGICAL DESIGN STAGE

*What contents will be included in the course
and why?*

ORGANIZATIONAL ISSUES	Standards Accreditation Educational "Package" Intellectual Property
PEDAGOGICAL ISSUES A) ACADEMIC	Academic Area Main Contents Technology Pre-requisites External Contributions
B) EDUCATIONAL	Learning Gaps Requisite Skills
TECHNOLOGICAL ISSUES	Technology Standards
EVALUATIVE ISSUES	Evaluation Model

Standards

Issues:

- What standard(s) will apply to the course?

Options:

- National/provincial standards
- Industry-wide standards
- Mega-institutional standards
- Internal institutional standards
- International standards

Comment:

If the courses are part of an accredited program then the standards that will apply to the course are pre-set but, if not, a decision must be taken about applicable standards.

If the organization is part of a larger mega-structure, then there may be special standards that will apply.

If the organization is a corporate entity, it will need to decide if company standards or cross-industry standards (if there are any) should apply in order to keep the company competitive. Will these be international standards?

For special courses there may be considerable flexibility to apply internal standards only. For example, some pre-requisite courses might only need to be concerned with internal requirements.

Traditionally, educational delivery has been governed by national standards or even state/provincial standards. There will be increasing pressure from educational consumers for internationally recognised standards.

Recommendations:

Corporations have the most flexibility here and, given the the change in employee/employer loyalties following downsizing, and the need to stay competitive, industry-wide standards should be explored systematically. Everyone needs to think internationally for the future.

Accreditation

Issues:

- Will the Course need to provide some form of accreditation?

Options:

- A stand alone course whose only accreditation is that it will take place under the auspices of the organization
- A unit/module that forms part of an externally accredited program

Comment:

Some students will only need the course for its applicability to a particular educational gap that does not relate to the need for accreditation. They are usually attracted in part by the content of the course or the technological delivery mechanism, and in part by the reputation of the delivery organization. A non-accredited course may offer more opportunities for experimentation and more freedom to respond quickly to student demand.

Other students will only be attracted by courses that can be built into a recognised qualification. This will involve the organization in a more lengthy course design process that will need to meet the approval of the governing body of the organization and external accreditation bodies.

Recommendation:

The decision about accreditation will be influenced by the market research undertaken by the organization, and the details it provides about the specifics of student demand. So do the market research before making this decision.

Educational 'Package'

Issues:

What will be the overall technological format of the course?

What resource implications will this have for the organization?

Options:

- Decide on the overall technological format first
- Let the technological format evolve as the design process develops

Comment:

A typical decision will be whether the course will be mainly based on computer use alone or will it involve other media such as broadcasting or print or video-tapes.

What activities will the media be used for? Course delivery, student assessment, administrative procedures?

While there is no need to choose specific technologies at this stage, it is useful to have an idea which media might be involved because this has implications for the allocation of resources that need to be planned for in good time. It is another reason why the technologists need to be involved at an early stage in the planning.

There are cost and human resource considerations, as well as the possible involvement of outside agencies to be taken into account, all of which must be planned for in advance.

Recommendations:

Involve the whole course team in planning the overall technological format, and deciding what media will be involved in what activities at an early stage to allow for careful and meticulous planning to take place. This can make the difference between success and failure.

Intellectual Property

Issues:

- Who owns the copyright to the course content?

Options:

- The organization owns the overall course content copyright
- The academic staff own the copyright of the course content and the organization acts only as the 'publisher'
- The course team owns the copyright and the organization acts only as the 'publisher'

Comment:

This has become a very hot issue in academic circles as technology is changing the 'author/publisher' relationship. Traditionally academic staff have freely 'given' course content to their organizations by delivering lectures and seminars in exchange for a non-specific remuneration. Any published material that they developed belonged to their own copyright.

Now disputes are arising for two main reasons:

Virtual courses are rarely designed by the academic alone but involve other specialists related to the technology involved. These specialists can reasonably lay claim to some rights in the 'ownership' of these virtual courses.

The need to acknowledge copyright of external materials used by the course is also more complicated by the nature of the variety of delivery mechanisms now available. Who, for example, should own the copyright of a video-taped interview of external experts used in a course?

Recommendation:

These are all issues that must be resolved at the organizational level at the outset. Be sure that all outside experts and externally sourced materials have their copyrights respected.

Academic area

Issues:

- In which academic department should the course design be located?

Options:

- Locate the course design and delivery in the academic department that most applies
- Locate the course in the Continuing Education department

Comment

While a course can be, and often is, designed by a cross-department course team, it is usually necessary for organizational purposes to locate it in one department or another. This has important implications for content.

Most virtual education courses will be designed to attract a continuing education market, but many will have to serve a dual purpose: for on-campus undergraduate students and for distanced continuing education students.

Continuing education students are much more likely to demand work- or industry-specific course content. Some educational organizations are more responsive to industry than others. Depending on the organizational culture, a continuing education department and its academic staff may be more aware of the content required by the workplace than those in the main academic departments. There have been instances where experiments have been allowed in Continuing Education Departments and, if and when successful, are removed to the main university department, which subsequently has an adverse effect on the relevance of content.

Recommendations:

Wherever the course is located do not overlook the expertise in continuing education departments - that is where the market growth will occur.

Main Contents

Issues:

- What balance of knowledge, skill and attitude development needs to be included in the course?

Options:

- Any type of content can be delivered through virtual education so the options are wide open.

Comment

Knowledge or factual content is no problems, but skills and attitudes can also be part of a virtual course.

Skills training, for example, is often conducted using the latest technology: flight simulators for pilots, and even doctors can be trained in surgery using virtual reality.

Many types of attitudes can be influenced by successful self-study at a distance. Examples from the evaluative case study and the literature show increased confidence and improved attitudes to teamwork following virtual courses.

Recommendation:

The choice of content should be a wide open academic decision. There is no reason for it to be pre-determined by the technology.

Technology Pre-requisites

Issues:

- Is there a need for a technology pre-requisite course or courses?

Options:

- Design a stand alone technology pre-requisite course
- Design a technology pre-requisite module of the course

Comment:

If the marketing information indicates that students will need either some general training in computer skills in order to complete the course, a separate pre-requisite course could be advantageous. There will likely be substantial areas of knowledge for them to assimilate, as well as skills practice, and this might be better attempted in a separate course that could also act as a precursor to other VE courses.

If market research information indicates that it is more a case of needing some specialized skills for a specific virtual course, then an introductory unit/module might be sufficient.

Evidence from the evaluative case study confirms a common finding in the literature: that students can be extremely frustrated by the technology itself, in spite of being keen to use it. This can impact negatively on the success of a course.

Recommendation:

Plan for some form of technology pre-requisite for all VE courses.

External Contributions

Issues:

- Does the course content need supplementing by the use of external experts?

Options:

- Use only in-house expertise and rely on freely available, non-copyrighted material for supplementary content.
- Bring in additional material from outside sources.

Comment:

The best courses usually have the widest range of sources to stretch students minds. So the ideal would be to use as wide a range of content material as possible. Sometimes this becomes a matter of cost and time for checking copyrights and negotiating fees.

In a virtual course, the use of material on the web may provide a partial solution, but increasing amounts of web-publications are covered by copyright statements and these need to be respected. Many but not all information sources will provide free educational use of their materials but this needs to be checked.

The other sources of information may include commercial videos, audiotapes, books, CDs or material from other educational institutions, which may or may not bear a cost. Cooperative course design and delivery is an option that is already used by some institutions and continuing financial pressure may see this increase.

Another source is industry experts and they may be willing to provide their expertise for 'free' - sometimes literally or sometimes in exchange for some PR for their company.

Recommendation:

Go for a wide range but be careful to check copyrights.

Learning gaps and Unit Structure

Issues:

- What student learning gaps is the course attempting to fill?
- What is the best course structure for such a purpose?

Options:

- Create stand alone modules that fill a market need
- Ignore specific market niches and design only integrated courses that together form a degree or certificate program.
- Create courses that can be either stand alone courses or form part of a large accredited program.

Comment:

It may be much easier and quicker to respond to market need by creating a course that is a stand alone and not part of a larger accredited program of study. The development of courses for accreditation can be a lengthy, bureaucratic process.

The most cost-effective option may be to design with both accreditation and non-accreditation in mind. The problem here is that students may want to know up front if the course they are taking will definitely count towards an accredited program down the road and this may be impossible to guarantee.

Recommendation:

The best option may be to design with accreditation as the target but allow for early release of modules that are being demanded in the marketplace - maybe as experimental courses to an invited student population.

Requisite Skills

Issues:

- Will the course be designed with the existing skills of potential students in mind or demand the acquisition of many new skills?

Options:

- Design a course that demands few new skills of the students
- Design a course that demands considerable amounts of new skills acquisition by students

Comment:

While we have already discussed the possible need for a technology pre-requisite, the issue now centres on the amount and type of new skill acquisition that will be required of the *average* potential student. How many students will be deterred from taking the course because they will have to acquire too many new skills WHILE they struggle to acquire new bodies of knowledge. This is where course designers will have to rely on the quality of their market research information.

How willing are students to be stretched to learn a lot of new skills (quite often technological ones) if their main interest is on the knowledge content of a course? How many students in the potential market are willing to stretch in this way? They may require a whole range of new abilities, such as keyboarding, oral presentation, team communications, statistical analysis, that will be too much of an overload for a full-time worker.

If the course designers opt for a high level of new skill acquisition, this also has implications for technical support resources and educational counselling provision for the course.

Recommendation:

Market research is the answer! Some students like being stretched, others prefer a more gradual approach. The organization needs to find out what the bulk of their target market prefers.

Technical standards

Issues:

- “A lack of standard approaches to managing on-line education content and courses presents a significant obstacle to realizing the potential of the Web for effective teaching and learning”

Options:

- Get involved with the IMS Project
(see www.imsproject.com)

Comment:

There is now a concerted international movement to promote some common technical specifications for on-line courses. This is an attempt to prevent the continual re-invention of the (less than best) wheel that only serves to frustrate learners with its “bugs” and incompatibilities.

“The IMS Project is developing and promoting open specifications for facilitating on-line activities such as locating and using educational content, tracking learner progress, reporting learner performance, and exchanging student records between administrative systems. These specifications will increase the range of distributed learning opportunities and they will promote the creativity and productivity of both teachers and learners in this new environment.

“The goal of the IMS project is the widespread adoption of specifications that will allow distributed learning environments and content from multiple authors to work together. To this end, the project will produce a technical specification and proof-of-concept prototype.”

Recommendation:

It’s best to visit this web site for yourself! Your organization may wish to become involved.

Evaluation Model

Issues:

- What issues are to be explored in the evaluation?

Options:

- Explore learning and its outcomes
- Explore learning and its outcomes as well as the technology and its effectiveness

Comment:

In VE courses it is hard to separate the learning from the functioning of the technology. It therefore seems logical to take both into consideration

The only problem can be that evaluators can get 'hooked' on the technology problems (there are always some!) and these often become seen as more determinant of success /failure than is likely.

The evaluation model needs to explore all these issues :

- the conditions of the learning environment, including, (but not restricted to) the problems associated with technology, that contribute to course completion and enjoyment

- the main learning outcomes in terms of knowledge, skills and attitudes

- the unexpected learning outcomes

- the stakeholders' recommendations for improvement

Recommendations:

Devise a comprehensive evaluation model but beware of over-concentration on the technology

DELIVERY DESIGN STAGE

*How will the course be delivered
and what media will be used?*

ORGANIZATIONAL ISSUES	Resources Licensing Structures and processes Real Estate
PEDAGOGICAL ISSUES A) ACADEMIC	Academic Imperatives Equipment Applications Expertise
B) EDUCATIONAL	Pedagogy Time/Timing Location
TECHNOLOGICAL ISSUES	Technology Choices
EVALUATIVE ISSUES	Evaluation Instruments

Resources: human, financial, capital equipment

Issues:

- Can the course be delivered with existing resources?
- If not, how will the extra resources be found?

Options:

- Use existing resources
- If extra resource are needed, seek partnerships with industry or other educational institutions or other corporations

Comment:

Virtual courses, especially those that are being delivered in a dual (virtual & non-virtual) mode can be costly to design and deliver in terms of financial resources and capital equipment. On the other hand, they may be less costly in terms of human resources and real estate costs.

If the costs exceed the current resources of the organization, it can be a good idea to seek some form of cooperative venture to help meet costs. This can range from inviting industry to cover some of the cost in return for advertising or public relations activities.

An alternative that is becoming increasingly popular is for two or more educational institutions to pool resources to design courses than can be delivered by all the partners. Some of these arrangements have been discussed earlier in the papers by Mason and Latham. Long known in the IT industry (and other sectors) as 'Cooptition' this option is catching on among public educators all over the world.

Recommendation:

Seek partnerships - apart from the benefits of pooling resources it is in the spirit of a 'community of scholarship'.

Licensing

Issues:

- What software licenses will need to be purchased in order to deliver the course?

Options:

- The organization can design custom software for course delivery
- The organization can buy off the shelf delivery software

Comment:

Sometimes the design of custom software can be appropriate, and incidentally may be licensed to other organizations and turn into a money making venture.

However, the cost of this may be considerable and unnecessary if there is good proprietary software on the market - there is no virtue in reinventing the wheel.

Another consideration is the fact that already existing software is more likely to be known by potential students and therefore be more useful and relevant for them.

If commercial software is used, it has to be properly licensed and most has an educational discount. For the sake of its own reputation, the organization should make it clear to students and staff that it does not condone 'pirating' in any form.

Recommendation:

Explore commercial software (or freeware) first.

Structures & Processes

Issues:

- What new structures and processes will need to be created in order to deliver the course?

Options:

- Adapt existing structures
- Create new structures

Comment:

The delivery of virtual education can demand new structures and processes to deal with the new mode. This can range from course team structures, which can cross departmental boundaries to arrangements for student support and assessment.

In this process the accepted principles of academic freedom can come into question and the whole process can become highly politicized. Just to give one example that is common to both public and private sectors, cross departmental initiatives have very real consequences for departmental budgets when new costing procedures come into being.

Any organization needs to be ready for this problem early on. It may be multiplied if the organization is in a cooperative venture with others, which is one reason why “cooptation” is still comparatively rare despite its other obvious advantages.

The up side is that getting into virtual education may propel the organization into a much needed review of its existing structures and processes. One obvious example of the effects of virtual education delivery on structures and processes is the need to provide out-of-hours technical support, which may in fact need to be a 24/7 service.

Recommendation:

Use the opportunity to review existing structures and processes.

Real Estate

Issues:

- Will the delivery involve remote locations for which the organization will have some responsibilities?

Options:

- The course is dual mode, so the organizations may have some responsibilities for the learning context within its own territory
- The course is entirely home-based, so students are responsible for their own learning context
- The course delivery is via remote locations, such as other universities or workplaces, for which the organization bears some responsibility for the learning context.

Comment:

Few organizations are prepared for the problems of dealing with remote locations but this may have to be taken into consideration when delivering virtual education.

There is evidence that this practice may increase as courses are delivered through libraries, community centres, workplaces, and even in store locations in shopping malls.

The responsibility for the provision of technical support is one big consideration. Other practical problems, such as company firewalls, are another.

These issues will have to be considered carefully by the course design & delivery team(s), which may or may not have the same members.

Recommendation:

Get onto this potential problem early - negotiations can take time and back-up provisions need to be arranged - location arrangements have been known to collapse at the last minute!

Academic Imperatives

Issues:

- Are there special arrangements or protocols that need to be established in the delivery of the course?

Options:

- It is not an option to ignore this issue - it can be of prime importance.

Comment:

The use of various technologies may need to have special 'protocols' for educational use.

One example that the evaluative study raised was in the use of a chat line for class discussion. There needs to be a common agreement on protocols amongst the class on how this will be achieved or a free for all will result that makes coherent discussion, allowing for the development of arguments, next to impossible.

The protocols for discussion in a conventional classroom are generally taken for granted - you do not interrupt other people and you signal your wish to speak, usually by a raised hand or similar gesture. This has to be organized for web conferencing also. Using the technology for its own sake may accomplish something but it may not be the educational goal that was intended.

The quality of the communication must be sufficient for the educational process to take place effectively.

Recommendation:

Make sure that educational protocols are developed for the use of the chosen technologies.

Equipment & Applications

Issues:

- Will academic staff need to be provided with special equipment or applications?

Options:

- Use delivery technology already in use by the academic staff
- Use delivery technology that will require re-equipping academic staff

Comment:

If the academic or training staff who will be involved in the course delivery are already sufficiently equipped this becomes a non-issue.

If they are not, then the cost of equipping them will need to be allowed for in the costings.

However, these costs may cover more than the course delivery. This re-equipping may encourage otherwise reluctant academic staff to get enthusiastically involved with virtual education. And there can be trade-offs that may be attractive. For example, staff using equipment at home don't have to travel to a central site, saving time and expense.

Recommendation:

Make a list of all staff involved and their need for equipment and software. Check this against available equipment & software. The difference can be costed and bought or adjustments in delivery design will need to be made.

Expertise & Training

Issues:

- Do academic staff have the necessary expertise to deliver the course?
- If not, are there resources available for training?
- Are the academic staff willing to take this training?

Options:

- Use only staff who have the necessary expertise and enthusiasm
- Use considerable resources to train staff for the new delivery modes

Comment:

Using already trained and enthusiastic staff may be the best solution in the short term but may be impossible in the longer term.

Persuading untrained and unwilling academic staff will be a taxing business but may be necessary in the future. Offering training in the new technologies could be sold as a career advancement opportunity, but some staff will perhaps feel too threatened to take advantage of such offers and there will be little profit in forcing the issue. Best to retain them for delivering campus-based courses.

Recommendations:

Conduct a needs assessment for training and match this against staff willingness to be trained. The size of the gap is a clear indication of how big a problem the organization faces in getting into VE course delivery.

Pedagogy

Issues:

- What teaching methods will be used in the course?

Options:

- Any teaching method can be used with the new technology, so the options here are wide open.

Comment:

The new technologies provide a wealth of opportunity to deliver conventional methods in 'new' ways. Talented lecturers can be video-taped, audio-taped, or heard via web or videoconferencing, and there is always print - either in prepublished form or transmitted over the web for printing in PDF format.

Class discussions can be conducted via video- audio- or web-conferencing. Self-directed research can use conventional libraries, designed electronic libraries, or the whole of the Internet, with sources of information from all over the world.

The whole issue of how important face-to-face interaction is to the quality of the educational experience may never be resolved to everyone's satisfaction. While some students were satisfied with the type of interaction with their tutor that the new technologies allowed, others found it too impersonal. However, this can sometimes relate to frustrations with technology that can be resolved.

As for interaction with other students, there was more desire to have at least one meeting face-to-face. It might therefore be wise if the course contains a large element of home study, and even more if there is required teamwork, to encourage and facilitate self help groups of students who live near enough to meet in person.

Recommendation:

Do not be limited in the choice of teaching methods - there is always a technology that can deliver it. A mixture of methods may be best for accommodating different learning styles.

Time & Timing

Issues:

- How frequently will the course be offered?
- Will it have set start and finish dates?
- Will it involve any synchronous 'attendance' (i.e. in person or over a communications technology) at a set time?

Options:

- Offer in the same time frame as a campus-based course
- Offer at times totally convenient to continuing education ('adult') students

Comment:

Lifelong learners in the workforce have different responsibilities and priorities than conventional undergraduates. Work and families cannot be ignored. If courses are to appeal to this market an 'anywhere, anytime' philosophy may have to be adopted by the delivering organization.

This does have implications for the organization itself, especially as universities, for example, follow the school pattern of an agrarian-based year, with long vacations over the summer.

However, courses that are totally asynchronous may be relatively easy to offer at 'any' time. The problem of no set start dates, and even more for no set finish dates, is the problem of student motivation to actually finish the course. The completion rate for Iteration 3 of the evaluative study was much lower than for the synchronous courses that preceded it. A set *length* of time may be the answer here, so that once a course is started, it must be finished by a set period of time.

Recommendation:

There is an absolute need to be sensitive to students in the full-time workforce, and their available time slots, if you want to be competitive in the education market.

Location

Issues:

- Will the student's learning location impact on effective course delivery?

Options:

- Deliver the course in such a way that the location does not affect the course outcomes
- Warn the students of the possible problems that may arise from the course delivery

Comment:

Students may access the course from a variety of different locations and this may affect the delivery of the course.

For example, students accessing the course at work will rarely be able to access synchronous web conferences scheduled in the evenings, and students accessing at home may not be able to access them during the day.

Students using a computer at work may not be able to access an Internet-based course at all because of company firewall problems.

These types of location-based issues need to be taken into account when deciding delivery mechanisms.

Recommendation:

Market research yet again!

Technology choices - Intrinsic features

Issues:

- How large an audience does the course need to reach and does it need a one-way or two-way communication flow?
- Will it need to be synchronous, or asynchronous communication or a mixture of both?
- Does the course require visual, aural or written forms of communication and does there need to be a record of the communication?
- Does the course communication need to be linear or non-linear?
- Does the course require a high degree of interaction with other people or information sources or can it be a simple routing procedure through a pre-set amount of information?

Options:

- The answer to these and other related questions will determine the options available. For detailed options the technologists on the course team will need to be consulted.

Comment:

New technologies are coming onto the market continuously, as well as updates and improvements to existing hardware and software. Hardly anyone can keep up with all the developments, even technologists themselves.

Recommendation:

Rather than have technologists suggest specific technologies, first ask all the above questions and then ask them to name specific technologies that will do what is required. These may vary in cost and have other advantages and disadvantages that will help make the final decisions.

Technology Choices - Extrinsic features

Issues:

- Is the proposed technology generally available?
- Is it compatible with earlier versions of itself or with other software/hardware?
- How familiar with the technology will the average student be?
- Is technical support available for the proposed technology?
- How expensive will it be for the student buy it?
- How complicated is it for the average student to learn to use in a reasonable amount of time?

Options:

- Run the choices of technology that have survived the questions about intrinsic qualities through this new set of questions - it will further narrow the range of options
- Let the technologists decide for you

Comment:

Asking the above questions may help further narrow the selection of technology for the course delivery. It is always possible that a technology that is perfect from the point of view of the organization's needs will fail the test of meeting the student's needs.

Selecting technology that is not easily available, too complicated to learn quickly is too expensive or is not accompanied by sufficient technical support, or that is incompatible with most other systems, will frustrate students to the utmost and reduce the likely success rate for the course.

Recommendation:

Ask the awkward questions above and demand answers before you select specific technologies.

Evaluation Instruments*

Issues:

- What data collection methods will be used and how will this relate to the course delivery modes?

Options:

- The evaluation can collect data in ways unconnected with the course delivery methods or it can use the same technologies for data collection as the course does for course delivery

Comment:

The advantage of using the same technology for evaluation as for course delivery is that it can provide insights into the problems being experienced by the participants in the process. For example, on Iteration 3 of the evaluative case study, a decision was made to send the questionnaires to students via e mail, which was being used as a main means of communication. It soon became apparent that the many of the students were having problems with e mail, and specifically with attachments.

On Iteration One, the evaluators observed the class sessions in person and at a distance using the videoconferencing technology in the same way as the students. It was easy to see exactly the nature of the problems students were having with the technology, and how it was affecting the quality of the educational experience.

Recommendation:

We would certainly advocate using this technique of matching the evaluation media with the course media, but it may have to be supplemented for the sake of response rates and validity by other data collection methods.

**Examples of evaluation instruments used in the evaluative case study are provided in the Appendix.*

IMPLEMENTATION STAGE

What provisions needs to be made for the action involved at this stage?

ORGANIZATIONAL ISSUES	<i>Staff support procedures Student support procedures</i>
PEDAGOGICAL ISSUES A) ACADEMIC	<i>Tutor responsibilities</i>
B) EDUCATIONAL	<i>Monitoring procedures Assessment procedures</i>
TECHNOLOGICAL ISSUES	<i>Technical monitoring Technical support</i>
EVALUATIVE ISSUES	<i>Reporting requirements</i>

Staff support procedures

Issues:

- What extra support is needed for academic staff?

Options:

- Support is provided through a course team structure
- Support is provided on an as needed basis

Comment:

Virtual education provision, with its ability to reach hundreds of students with one course delivery, and its potential use of several different technologies, tends to break down the autonomous nature of conventional university teaching.

This has some compensating advantages, one of which is extra support. The ideal is to provide this through a course team structure and process, but it is possible, if resources are tight and the technologies used relatively simple, to provide intermittent support as needed. This would probably involve some technical back-up and extra help with the increased assessment that large student numbers will require.

Academic staff may resent or embrace a support structure of whatever composition, but there is no doubt that the advent of virtual education will change the nature of the teaching role. It will tend to reduce the isolated autonomy of the relationship between professor and student, and the organization needs to be aware of this.

In a commercial organization the training is not as likely to have this characteristic and any move towards virtual courses will likely be smoother.

Recommendation:

Go with the course team structure if at all possible. This reflects latest developments in the workplace and can reduce academic isolation.

Student support procedures

Issues:

- Can the organization rely on its current student support structures?

Options:

- Use/ adapt existing student support structures.
- Set up new student support structures for virtual education students.

Comment:

Whether or not the organization needs to set up new structures partly depends on how it already copes with its continuing education students.

Adult students in the workforce have different needs from conventional undergraduate students and may be more sophisticated consumers. They will need, and may well demand, support at times convenient to them. Help lines and administrative information services may need to be set up on almost a 24 hour basis if the organization wants to be competitive in future education markets.

As competition increases (as it will for virtual students) and as the focus shifts from teaching to learning, and from campus-based to self-directed, so will the power of the educational consumer inevitably increase.

This is true also of commercial organizations, where employee loyalty is no longer guaranteed and workers take increasing responsibility for their own careers. Training is seen as an important factor in job satisfaction for many employees and they will seek companies that are willing to support them in this endeavour.

Recommendation:

Best to take a good look at setting up special support arrangements - this is a growing market and the quality of student support will be crucial.

Tutor responsibilities

Issues:

- What exactly will be the role of academic staff when teaching a virtual course?

Options:

- Maintain a traditional role where teaching, assessment and student support are all undertaken by the same person.
- Break down the traditional role and have different people responsible for the various elements.

Comment:

If one academic/trainer in an organization simply teaches a course on the Internet to the same number of students, the traditional role can still be maintained in the interaction with students. If, however, virtual education is adopted more widely in an organization, and a course is delivered to hundreds of students simultaneously, the academic role will have to be broken down into its component parts. One/some person will be responsible for teaching, another(s) for student support, and others for assessment. In distance education, the current alternative is to have many people teaching the same course and also undertaking all three roles at once.

In either case, VE will likely entail a change in the way the teaching role functions. If the role is fragmented, new academic stars will emerge, rather like newsrooms, where there are star anchors and star reporters. If, instead, increased numbers of multi-function tutors are employed on one course, this raises the problem of a level playing field for assessment.

Recommendation:

Get ready for the change from a subject specialist, multi-role academic (where one person is researcher, content specialist, teacher, counsellor, assessor & evaluator) to the activity specialist, single role 'star' system (where a faculty member or trainer will specialize in a single activity, be it presentation, or assessment or counselling or content preparation).

Monitoring & Assessment Procedures

Issues:

- How will consistency of assessment standards be achieved?
- Will new technologies be used for assessment?

Options:

- The only option is to set up monitoring and assessment procedures that are common across the course delivery.

Comment:

There are always people who mark more 'leniently' than others. Most organizations have some form of procedure to deal with the problem but this is multiplied many times over once an organization has to deal with many different people marking the SAME course at once.

The logical answer is to monitor the markers but this might be seen as a threat to academic freedom in some institutions. This is another area where the organization will have to negotiate this type of arrangement with its staff.

In addition, many of the new technologies lend themselves to computer- or student self-administered assessment. If the course intends to employ these methods this needs careful planning from the outset. Computer-marked assignments, while sometimes scorned as simplistic by many academics may have their place, especially for mainly factual, knowledge-based courses. Computer-generated self-assessment can also provide the student with very quick feedback, and so may form part of a course, even if not used for organizational assessment or accreditation.

Recommendation:

This can be a hot potato but it has to be dealt with. Students will demand consistency across the board. Start negotiating now.

Technical Monitoring & Support

Issues:

- How will the technology be monitored?
- What technical support will be provided to students?

Options:

- There is no real option except to provide the best monitoring and support possible - at least if the organization wants to continue to attract students.

Comment:

Any organization that delivers virtual education courses needs to ensure that the technology is functioning correctly and effectively, and that the students are receiving the support they need to complete the course successfully.

This can be a challenge because large parts of the technological functioning may (probably will) be outside the direct control of the organization. They cannot, for example control all the conditions of a remote location, especially where this is the student's home or workplace. There are also intermediaries, like Internet service providers, who can affect the way the technology operates. One example from the evaluative case study involved team assignments that were affected by the fact that a service provider was 'bunching' its e-mail delivery so that it was not the instant form of communication that everyone had anticipated.

Recommendation:

All the organization can do is to ensure that the technology is monitored in a timely fashion, and support is provided as students require it. It sounds simple but it takes a lot of managing to get it right. Meticulous planning will help. Don't let technologists treat the courses as 'beta' versions unless this has been made clear to students and they are being compensated for this in some way.

Evaluation Monitoring & Reporting Requirements

Issues:

- To whom should the evaluator report and how often?
- Should the evaluator act as go-between?

Options:

- Report regularly to the course team
- Report directly to administration at agreed intervals.

Comment:

If the evaluation is to be formative, it makes sense to report regularly to the course team at team meetings. In this way regular feedback is given that will supplement any monitoring that members of the course team are undertaking, and problems can be corrected before they become serious.

If the evaluation is simply a summative report then this can be delivered to an administration representative at the end of the course. One problem here may be that a virtual education course may have no clear ending. When courses are entirely free of time and space constraints, they may be continually ongoing.

Given these conditions, it makes more sense to have formative evaluation as part of a course team structure and process.

Recommendation:

Ongoing reports to course team and a final report to the administration.

EVALUATION STAGE

What will be done with the evaluation?

ORGANIZATIONAL ISSUES	<i>Feedback process</i>
PEDAGOGICAL ISSUES A) ACADEMIC	<i>Academic input to evaluation</i>
B) EDUCATIONAL	<i>Educational technology & student input to evaluation</i>
TECHNOLOGICAL ISSUES	<i>Technical input to evaluation</i>
EVALUATIVE ISSUES	<i>Analysis</i>

Feedback process

Issues:

- What structure and process is in place for receiving and reviewing the evaluation?

Options:

- Set up a special evaluation meeting at the end of the first course delivery
- Rely on the final report

Comment:

The advantage of a special meeting is that attention can be focussed on USING the evaluation. Further action can be agreed and minuted.

A report can always sit neglected on a shelf because everyone is too busy with their own problems to read it. Either the evaluation was informative, even if it detailed things that everyone would rather not have to deal with, or it was of little use.

If it was informative, this information needs to be used. If it wasn't the evaluation brief or the evaluator needs to be changed.

Recommendation:

Set up a meeting to review the evaluation - remember it is another form of market research, and on students who actually signed up and took the course.

Academic Input to evaluation

Issues:

- How will academic staff provide input to evaluation?

Options:

- Use the course team structure
- Communicate directly with the evaluator(s)
- Do both

Comment:

If a course team is in place it makes sense to use this to discuss problems (and successes!). If not, then the academic staff need to have a communication line open to the evaluator(s).

There are some occasions when one is more suitable than the other. If a purely academic problem arises, it may be better to hash this out without using the time of the technology members of the course team.

Recommendation:

Do both!

Student and Educational Technology Input to Evaluation

Issues:

- How do students make input to the evaluation process?

Options:

- Students respond to evaluator(s)' requests
- Students initiate responses to evaluator(s)
- Students have an educational technologist as their representative on the course team

Comment:

In our experience it is better for the evaluator(s) to take the initiative and contact students for feedback to a set of evaluative instruments.

However, it is also a good idea to invite students to contact evaluators if they want to make any additional comments. The reason for this is that sometimes students feel more comfortable making 'complaints' to or asking advice from people who will have no hand in assessing them. The disadvantage can be when evaluators are unable to achieve the desired improvements to the course. In this case there needs to be some statement(s) made up front about the willingness to pass on student comment quickly and anonymously but with no guarantees about immediate solutions.

Most students, in our experience, are willing to be altruistic and provide comments that may improve later versions of the course, if this can be done without damaging their chances of doing well in the current course. Virtual students, however, may have a more impersonal relationship with academic staff, and have less compunction about complaining to anyone who will do something about the problem.

Recommendation:

In addition to student input to the evaluator, make the educational technologist on the course team responsible for following through on confidential student problems.

Technological

Input to evaluation

Issues:

- How do technologists input feedback to the evaluator(s)?

Options:

- Use the course team structure
- Contact the evaluator directly
- Do both

Comment:

The same conditions apply here as to the academic staff. The course team may be the most effective route but there may be occasions when it is more time saving to go direct to the evaluator with a problem that needs to be considered in future course iterations.

There does need to be some mechanism for letting the evaluator know what common problems the help line is uncovering.

Recommendation:

Do both!

Evaluation Analysis

Issues:

- What relative weight will be given to educational versus technological problems

Options:

- Give more weight to educational concerns
- Treat both as equally important

Comment:

In our experience, it is a rather endearing aspect of human nature that makes it easier for people to complain about technology than about other people. For this reason it becomes necessary to consider weighting the data collection and analysis in favour of educational concerns.

In any event, it tends to be the extrinsic factors in the use of technology, rather than the intrinsic features of the technology itself that gives rise to problems. For example, on nearly all the case studies, it was the problem of timing the use of the technology that was the biggest problem for group work. Another big problem was the composition of the groups in terms of geographic location, cultural diversity, hours of availability and level of motivation. This affected achievement much more than technology problems, which tended to be temporarily frustrating, but fixable, rather than a continual problem.

Recommendation:

Be aware of the problem but do not prejudge the issue.

MAINTENANCE STAGE

What happens after the first course iteration??

ORGANIZATIONAL ISSUES	<i>Maintenance process</i>
PEDAGOGICAL ISSUES A) ACADEMIC	<i>Involvement?</i>
B) EDUCATIONAL	<i>Involvement?</i>
TECHNOLOGICAL ISSUES	<i>Involvement?</i>
EVALUATIVE ISSUES	<i>Involvement?</i>

Maintenance Procedures

Issues:

- Will there be a maintenance team?
- Who will be involved?

Options:

- Continue to use the course team
- Set up a special maintenance team

Comment:

The role of the maintenance team is to monitor the course through its subsequent iterations and make any necessary modifications that arise from the evaluation.

In ideal circumstances it would be best, for the sake of continuity, to use the course team to make further improvements.

In practice this is too costly in time and financial resources. Members of the course will have other pressing responsibilities and maybe other courses to develop.

The best that can usually be hoped for is that some members of the design and delivery team will be able to form the nucleus of (or all of) the maintenance team.

Recommendations:

Try and provide the best continuity you can.