Impact of Clicks on Bricks:

VET facilities planning in an information age

Final Report

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Introduction

The new learning technologies (NLTs) do impact the physical facilities of the vocational education and training efforts in Australia in a variety of ways. The review of the literature conducted as part of this project has shown that, despite differences in the educational models and stages of development around the world, there are some common effects that technology enhanced, supported or fully delivered off-site programs have on the range of activities that take place in our institutions. The search conferences conducted with Australian VET professionals have shown that the people involved in creating and managing these programs can collectively identify those impacts. The resulting documents from the literature review and the search conferences present the themes in several layers of detail that can be used by institutional planners, teachers and managers to think more specifically about their work in terms of their physical environments and the tools they can and do use for teaching and learning.

This summary report is intended to bring together the themes discovered in both the literature review and seven search conferences, involving approximately 150 VET stakeholders contibuting over 5000 comments and concepts. It is the final report to synthesise the underpinning principles with current research into the potential impact of new technologies on the design and future use of physical facilities in vocational education and training. Much greater detail can be found in the literature review and report of best practice principles and guidelines.

Trends

New Learning Technologies

New learning technologies (NLTs) as a subset of information and communication technologies (ICTs) come in many forms such as computers, video, scanners, digital sound devices, and of course, the internet. Examples can be found of applications of all of these devices in education, some at experimental stages and some well embedded in the educational process at all levels. The degree within specific institutions will vary from place to place, but it would be difficult to argue against the point that NLTs are providing new and exciting opportunities for accessing, creating, and delivering a richer learning experience (Ryland, 1998).

The reasons for the expansion of the use of technologies in education are many. They include responsiveness to the 'information economy' (Quinn, 2001) and need for technology skills in the workplace; a recognition of the benefits through the use of the new learning technologies to provide accessibility to education and training 'anywhere, anytime and anyplace' (TAFE frontiers, 2001); and more recently the inclusion of the same technologies in on-campus programs to provide access to information and communications opportunities for students attending programs in classrooms.

Ubiquitous Computing - Almost

Societally, the evidence has shown that the internet and its associated access equipment [personal computers and modems] are no longer arcane, techno-geek, and feared black boxes only available to scientists in white coats in research labs. The 1999 data from the Australian Bureau of Statistics shows that in Australia, computers are used by 76% of businesses and the internet is used by 56% (ABS 1, 2000). The internet use figure for 1999 is a huge increase over 1997/98 data which stood at 29% of businesses. This is particularly important to understand in the VET sector which prepares the workforce of the present and future.

Similar growth has been seen in households generally. Couples with dependents have computer access in 70% of cases, with internet access at 35% (ABS 2, 2000). Adult use of the internet is also higher amonst the younger age groups, 72% for 18-24 y.o., employed (54%) versus not employed (19%), and metropolitan based (45%) versus other areas (33%). In 1999, 30% of the 18-24 y.o. were accessing the internet from a TAFE or other tertiary institution. Alternatively, 79% of working age adults (25-54 y.o.) accessing the net are doing so from work.

One could assume then that large numbers of VET consumers into the future will be expecting, needing, and already using new technologies in their lives. Therefore, it is reasonable to expect that the VET institutes will be using these same techniques and equipment as well as teaching about them as part of the curriculum in most employment areas (Chaffee, 2001; Morgan, 2000; Ryland, 1998). All trends are up, although the rate of growth is less than in more recent times. The ubiquitous computing concept may be reaching the end of the growth spurt and moving in to marginal or slower growth.

Readiness of Learners/Teachers

As skills are more developed in learners their comfort with using the tools for new applications will be higher. The days of teaching 'computer basics' or 'word processing' will diminish with opportunities to spend time more productively on content of substance in the work skills/knowledge of the training program (Morgan, 2000). Similarly as teachers develop their skills in using the technologies to support the educational process, through experiences in online course delivery, preparing materials using standard computer software such as word processing and graphics, or managing their student data, their efficiencies will increase as well. The sophistication and expectations of both learners and teachers will increase, putting pressure on institutes to provide the right type of educational environments to use the tools well (OECD, 2000; Twigg, 1999).

Reverse Effects on the Traditional - Blending and Blurring

During the 1990s when the internet became more accessible to educational institutions and the world wide web was harnessed for direct access to and distribution of information (Creighton and Buchanan, 2001), a first step in utilising these two developments in tertiary education was through the model of distance education. The programs were 'experiments', 'trials' and 'pilots'. They were often suspect in relation to the traditional methods of teaching and learning in lecture theatres, classrooms, and hands-on practical laboratories which were catered for in the organising of the institutions and its services. 'Virtual' educational programs may not have carried the same legitimacy for awarding qualifications. Things are changing as more programs become available and are seen to have value while still being different from the traditional.

The next phase of development is leading to perhaps the greatest impact on the buildings and facilities of the institution. As the numbers of teachers and the learners increase who find the benefits of the NLTs in the virtual and experimental programs, it is a natural expectation that these same people will want to use the same tools in their 'traditional' teaching and learning environments (Morgan, 2000; Schoomer, 2000). Termed 'hybrid' or 'blended' learning programs, the edges are blurring between what is done 'at a distance' with technology as the means, and what is done and when it is done in a classroom (or library or learning centre or workplace) with the same technologies (Gilbert and Grayum, 2000). The barriers of time and place are being broken down by the NLTs, not only for distance education programs, but also for the 'on campus' learning experience (Green, 2000; Hagel, 2001; Louis, 2000; Norris, 1998).

This reverse effect on the traditional is impacting how people are looking at the educational experience. The traditional is being deconstructed into its component parts and reconstructed into different combinations of learning activities, information, materials, tools and demonstration of skills/knowledge attainment (Jilk, 2001). It is as if the technologies have become the catalyst for a renaissance in education, with new explorers, new approaches, and new outcomes. These explorations are bound to put pressure on the physical environments that we currently use and those designed for the future.

Technology Change

The technology 'environment' is changing, but perhaps not as drastically as in the 1970s through the 90s. Miniaturisation is continuing, but the extent of miniaturisation has reached the atomic level and would not have much further to go. Chips run faster still with each new generation, but perhaps without the practical increase in functionality for meeting common daily demands. Bandwidth for communication is still an issue in terms of affordability, with costs in Australia sometimes increasing rather than decreasing, as previously expected as a result of competition. "Convergence" as a concept, i.e. combining capabilities into single devices, comes and goes in the marketplace. Handheld devices are becoming more common place. Wireless networking is presented as probably the most important change on the horizon, supporting 'anywhere' computing access options with less reliance on hardwired connections (Coburn, 1999).

We have lived through the dot.com expansion and implosion. Still the numbers of internet users and 'publishers' continue to increase and put their information on the web. E-books have had mixed reception with some of the early marketers retreating in recent times. The software producers and governments are now focussing on methods to control intellectual property. Copyright and associated legislation are becoming more restrictive and punitive for non-compliance. New software distribution models have been trialed with no indication that a standard is emerging in that regard.

Each of these potentials, adjustments, comings and goings in the technology scene could and do have effects on the technology choices that are made for teaching and learning applications. Resourcing, managing, equipping, providing infrastructure, and staffing are areas that are continually challenged as the technology marketplace shifts and develops (Klingenstein, 1998).

Asset Management Advancement

Asset planning and management is also going through changes (Fox, 1998; OECD, 2001). Life cycle management is a key element of the processes involved. Technologies are providing support to the management of complex environments, with indications of integration with other enterprise management software packages specifically supporting educational institutions. Integration of information among the various management information systems will provide space utilisation direction for facilities planning into the future based on data rather than hopes or feelings.

Shared Space Use

The involvement and partnership with communities in educational 'enterprise zones' and for delivery of programs where the learners live and work is an on-going trend (Hamaty and Lines, 1999; OECD, 2000; SCUP, 1998). This includes community facilities and workplaces. Some spaces are suitable for educational delivery and come with adequate technologies. Others require careful planning and consideration of equipping, scheduling, and supporting the facility (O'Donoghue and Graham, 1998).

Similarly in some states, incorporation of VET programs within other educational organisations such as schools and universities provides leveraging of capital development and operation costs of facilities, including NLTs.

Assumptions to Challenge

As part of the search conference activities, we asked the participants to consider assumptions about technology and facilities that they experience in their operating environments. They were asked to identify which of those assumptions should be questioned rather than taken as true at face value. These challenged assumptions are areas that could be viewed as gaps in the understanding or ability of the institutions to address the impacts of the NLTs on their operations and facilities.

Information and Communication Technology

In the ICT area, there were several common challengeable assumptions across the seven sessions.

- Access and Adequacy - can these be achieved and is the technology infrastructure in place in Australian communities to meet demand?
- Attitude and choice - are decision makers making appropriate choices in the application of NLTs as integrated delivery tools in institutions?
- Change in ICT - can the change needed in organisations keep up with the change of technology in a rational and predictable way?
- Cost - are costs of learning technology acquisition, implementation and operation fully recognised and the returns promised realistic when the long term costs are taken into account?
- Effectiveness - do we know enough to make determinations about the effectiveness of the technologies for learning or are we still operating on marketing 'hype' and hope?
- Learners - do learners have the required discipline to manage their own learning through the new technologies?

- Skills - do the teachers and learners across the range of age groups and study areas have the needed skills for applying the NLTs specifically for teaching and learning rather than the standard word processing and calculating applications?
- Social Contact - what is the contribution of social skills development and its effects on learning, with or without technology?
- Teaching preparation - is the time available in the workday for teachers to transfer their activities to the new teaching models and develop their skill sets to do so? Are there places for them to prepare as well as deliver?
- Support - are the national models/strategies and institutional implementations of the NLTs adequately addressing the support needed for success?

Facilities

In the Facilities Planning area, there were several common challengeable assumptions across the seven sessions.

- Attitude and Choices - It is a common assumption that there is a competition between bricks/buildings and technology options. Upon what factors should an integration of the two be pursued?
- Cost - As with the NLT challenges, the adequacy of the funding provided beyond the acquisition phase is questioned, as well as the competition for funding between the bricks and mortar and the infrastructure and equipment. Funding models are also out of step in many organisations, with funds for capital development of buildings often being unsupported with equipment and operating funds.
- Design - Is adequate attention being paid to the range of possibilities for balancing environmental concerns, the function of the spaces and the realistic expectations for computer access?
- Flexibility - What is a realistic expectation for affordable and timely flexibility within facilities that incorporate NLTs? Daily? Weekly? By the term?
- Planning - Will the needs for buildings in the future decrease? How adequate are the planning methodologies in place to address the changing views of facility use in terms of consultation, data on current utilisation and capacity, and timeframes? Are educational program plans taken into account adequately when planning the built environments to house them?
- Social Contact and Culture - What is the actual effect of attending programs in buildings versus through NLTs?
- Utilisation - What are reasonable expectations for building utilisation targets and in what combinations? What is known about current use patterns and capacity?

Results

By examining the questions raised in the challenged assumptions, the trends found in the literature and identified by the participants, and using the scenarios of four VET environments (Metropolitan, Rural/Regional, Workplace and Community) as frameworks for strategy discussions, the project yielded the following general and four categories of specific principles/impacts related to planning, design, technology and management. These points are easy to state, but should be seen as ideals to aim for, tempered with what is reasonable and achievable.

<u>General</u>

A key impact of technology on the physical facilities is the need for involvement of more and different people in the process in all stages, from planning through to usage. These include a range of stakeholders including teachers, support staff, specialists in facilities and technology, and the administration of the institute. In some cases, even student views are taken into account. This expanded involvement exposes differences in priorities, culture and knowledge specialities in each professional field.

Another impact is the relationship of the ‘time to/for implementation’ variables. Technology changes quickly but buildings are built to last over longer time periods. Additionally, technology can be relatively quickly put

in or taken out, whereas buildings have much longer planning, approval and build times. This difference in response time can set up challenges requiring careful management of expectations amongst the stakeholders.

The requirements for flexibility and adaptability are important impacts of NLTs on facilities today. Programmatic changes as well as the rate of change in technologies combine to increase the need for flexible and adaptable facilities to house those programs and tools.

There is a greater complexity as a result. This complexity impacts the sophistication required to 'get things right', on time and on budget. More infrastructure is required in terms of utilities and communications, for all aspects of the organisation. Spaces are multi-functional. Four walls, a set of desks in rows, and a display space are no longer adequate teaching environments.

In the VET environment, education is happening in all types of places, hence the examination of the various scenarios. This variety brings into play several impacts:

- coordination with other groups who may be the owners of those facilities rather than the institution,
- lack of adequate infrastructure, particularly telecommunications, in the non-metropolitan delivery areas,
- learning in the workplace where it may be necessary for the institution to work in partnership to provide required facilities including learning technologies or connectivity to them, and
- learning in the home which may lead to different types of on-campus support units such as call centres or materials distribution points for students studying remotely.

The new learning technologies also bring a dimension of communication and infrastructure support that differs from face-to-face, 'chalk and talk' teaching. Communication channels may range from electronic mail to video conferencing inside and outside of the classroom. The infrastructure, such as bandwidth and number of channels, may require the facilities and planning groups to work more intensely with new and exotic types of communication systems.

It is also important to understand that the technologies themselves are pervasive and multipurpose in the institutions. Not only must classrooms be facilitated, but also administrative offices, teacher offices, learning support units, and in some institutes, also the boarding facilities for students (Jamieson et al, 2000; Marcinkiewicz, 2001). The tools are used for development, delivery and administration of programs, and hopefully even for planning input and modelling.

Lastly, the expectations of all stakeholders are higher for many reasons. Technology can set up tensions and change anxieties because of the newness of it all. The fact that technologies often require some level of specialist support adds stress to the teaching and learning process. On the plus side, the contributions that come in terms of new capabilities and involvement of students in their own learning processes can be rewarding enough to make the demands worthwhile meeting.

> In the words of students in a US university, *"Technology is everywhere. Its use in the classroom makes me feel good about my education and also teaches me things I will need to know when I enter the workforce."*
>
> *"It is undeniably the future. To ignore it would be disastrous to anyone's career. Learning interactively now prepares us for our future*."

Planning

Turning to some of the specific principles and impacts, the planning area included four main points:

Needs based - scanning internal and external

Needs can be viewed from the institution's perspective and from that of the external community. Another way to put this is a shift to market driven planning. The match of the internal ability to meet those needs with the changes that will occur in terms of new programs needed or no longer needed for a specific community, or change occurring within existing programs, should be examined on an on-going basis for changes in technology use and the physical facilities requirements.

Strategic - program and goal driven

Planning should be led by program, goals and outcomes, and with a consideration of short, medium and long term objectives (Marcinkiewicz, 2001). The values and emphasis of the organisation should be explicitly stated in order to determine if the technology and facilities choices conform to the larger aspects of the

institution rather than driving them. It is easy to focus on tangible elements, but more important to understand the purpose and value support to programs that are expected from those tangible facilities and tools.

Systemic - institutionally and procedurally

Planning should be systemic. The full organisation, its communities of interest (McDavitt, 1999), and its abilities to perform, including its operational procedures should be included in the planning process. As an example, if a new technology enhanced facility is being planned, what are the technical support processes and staff that will also be required? What are the on-going resources needed? What are the professional development and training requirements for teachers and learners and staff?

Consultative - multiple stakeholders

Lastly in terms of planning, it should be consultative of the range of stakeholders, with ample time for creativity and input as well as needs identification in the short, medium and long term as much as possible. Stakeholders will extend to potentially long term relationships with technology and communication suppliers (Creighton and Buchanan, 2001; Jilk, 2001; Ryland, 1998).

Design

Turning to design principles, five main themes emerged.

Accessibility

Designs should provide for high levels of accessibility for a range of types of people and their capabilities. Entry points, furniture heights, placement of powerpoints are some physical design aspects of accessibility. In another sense, facilities must be accessible at appropriate times to meet learner needs. This might include providing multipurpose facilities, such as open computer labs, as well as specific use spaces such as computer equipped classrooms.

Sustainability

The technology enabled facilities must be sustainable, mostly from a financial sense, but also in terms of staffing requirements and larger environmental aspects. It would do no good to put in a proprietary technology that is not supportable with spare parts or technical expertise when needed. Sustainability is also often measured in terms of environmental considerations such as energy consumption, for example, heating and cooling as well as electricity to support hardware.

Manageability/Supportability

Designs must also take into account the manageability of the facilities. How will the facility be managed, by specialist staff or by teachers themselves? If specialist staff will be managing the technology and facilities, are they expected to be located near the space? Can they assist remotely? Are there stages of management that range from self-management through to centralised decision making for perhaps activities such as scheduling events?

Flexibility

Flexibility as a design consideration will assist with better facility use. Designs should optimise flexibility to allow for different programs and teaching methods. Is there space for bringing in books and writing materials as well as the computer stations on the desktops? Can teachers easily move around in the space? Is there a place for small group work as well as large group activities and still have access to support hardware and software (Jilk, 2001; Louis, 2000)?

Open to future change - 'future proof'

Lastly, spaces need to be designed to allow for future changes. Because of the speed of change in the technologies, what is here today, or even by the time the building comes online, will be changing to other potentials and capabilities.

Technology

There were four guiding principles with regard to technology, three of which would already apply to good facilities planning and management and one new idea (Downes, 2000).

Adequacy

The concept of adequacy relates to number and capability. The ratio of workstations to students is always going to be a moving target, but perhaps adequate numbers are "enough" as defined locally is the closest we can get. This must be coordinated with the program needs, the number of students to be involved, the number of teachers relying on the technologies, and the support access requirements.

Adequacy can also relate to capability. Is it the right technology choice for the teaching and learning task?

Location adequacy is also important. For example, is access adequate for teachers to prepare materials outside of classroom?

Functionality

The technology must also be functional to the purpose. This is particularly important with regard to different learning objectives and fields of study. Some programs are more visual, some more interactive, and some more verbal. Do the technologies selected and the facilities in which they will be used provide the right characteristics to meet those objectives? Does it have a capture capability for storage and review at later dates? Does it provide proper remote access for off-campus learners as well as on campus in functional spaces?

Reliability

The technology and support facilities must operate reliably (Louis, 2000). Technology has a higher failure potential than the traditional chalkboard. The critical nature of the teaching and learning activities heightens the effect of unreliable technologies. If students are connecting by telephone to your local computer centre as the sole means of accessing their program of study, the connection and your computer centre must be reasonably reliable in their operations. As mentioned previously, spare parts or spare devices can assist in meeting reliability requirements. Similarly, data backup is essential.

Interoperability [external and internal]

Finally, the new characteristic that comes with technologies is the aspect of interoperability. This may be considered both with regard to external connections, such as to workplace learning or homes, but also internally amongst different campuses or with government offices for such things as reporting and receipt of departmental information. A common example encountered in education is the Microsoft/Macintosh debate about what computers to put in labs. Any proprietary solution on offer must be considered with regard to the interoperability with other agencies, legacy systems [in order to retrieve historical information], and the installed base of the key users.

Management

The last major impact category is management.

Affordability

The technology and facilities must be affordable. A clear business model needs to be outlined in terms of the capital, recurrent, and replacement costs of ownership (Meeks, 1999). A comment made in some search conferences was the competition for already inadequate resources when technologies enter the mix. Realistic choices will need to be made amongst the competing interests and not ignored in the planning, development and management processes.

Controlabiity/managability

All facilities, with or without technology, must be managed (Bremmer, 2000). Facilities with technology adds a new dimension to the management process, with new elements to consider such as connections to outside service providers, outsourcing perhaps, new types of staff, etc. (Olsen, 2001)

Coordinated [external and internal]

In most circumstances, coordination amongst a range of people and interests will be needed. Some spaces previously assigned to a single department or faculty may now be shared. Special programs may need to have preferenced timetabling for specific facilities, with unclaimed times available to other groups, for example rooms equipped for videoconferencing. External coordination may occur when using shared community facilities or services such as communication networks.

Utilised

Finally, an interesting principle that emerged from our search conferences was the need to increase utilisation of the facilities that are constructed. Ownership issues may need to be reviewed in light of investments made in technology capabilities with increased multipurpose uses than in the past culture of the institute.

Summary

In summary, the major technology impacts drawn from the trends, challenged assumptions, and principles above, are:

- A more *structured business planning process* should be implemented which incorporates clear identification of user needs, quantified financial analysis and the appropriate mix of clicks/NLTs and bricks/facilities to maximise net present value of both.
- Facilities and ICT planning must be conducted at *various levels*, from specific places in a room to building to campus to community, for function, impact, and sustainability.
- The physical environment needs to be designed to invite the *acquisition and support of the necessary ICT skills and applications* by teachers and learners.
- Building spaces and network access infrastructure need to be *flexible in responding to the rapid evolution* of user needs in a dynamic training and employment environment.
- Buildings, ICT and network architecture need to be designed to *facilitate access* by students who are not able to obtain access using their own resources.
- Building design and staff resource planning need to ensure that the *future support needs* of ICT are met.
- *Continual assessment* of buildings, ICT and other facilities is required to maintain a functional learning and operational environment to take advantage of the continuing changes in technology.

Future Activities

The project, Impact of Clicks on Bricks, has been considered from the beginning of our work to be a first step in addressing the crossover impact of the addition of learning technologies on the physical facilities of VET. The work to date points to some logical next steps to further the work in regard to its dissemination and impact on the VET community. The following activities are presented for consideration of further effort supported by ANTA and other VET organisations:

- Online discussions - The project website has begun ongoing dialogue about specific issues, new findings, and problem solving. Various themes and ideas from the project could be put forward as discussion topics on the website. Similarly, the concepts could be streams for discussion in the ANTA series of annual Net*Working conferences.
- Review of the principles and guidelines - The principles and guidelines should be seen as a first effort to document those aspects from the field and the literature. They will require revision at some stage based on experiences of their implementation in VET institutes. The revisions may be a result of the emerging opportunities or changes in the industry and institutions as they evolve and mature.
- Distribution of these principles and guidelines and information about the literature review resources/links - Distribution options include papers and conference presentations, articles for journals and news items in the usual ANTA and VET publications.
- Case studies of ‘best practice’ examples in the various states/territories -Very few Australian case study examples were found during the literature search. It would be beneficial to build a collection of Australian stories that fit our own contexts of tertiary education.
- Testing of overseas tools and principles in the Australian higher education environment - Similarly, the tools and principles from overseas could benefit us if they were tested and reported in the Australian environment, and in different sectors such as VET.

- Follow-up with search conference participants regarding changes they have incorporated as a result of their involvement in the project - It would be interesting to revisit those who participated in the search conferences and ask them about the impact their participation in the project had on their work locally.
- Examination of the results of this work in conjunction with other Flexible Learning Framework projects, in particular the Technology Standards program. The two programs of facilities planning and technology inclusion should be integrated for a common general planning approach.

Conclusion

The Impact of Clicks on Bricks project has resulted in three major documents: an extensive review of the literature including a resource collection; a compilation of best practice principals, guidelines and self-check questions for facilities planning with attention toward the inclusion of new learning technologies; and this summary synthesis of the two components with future activities. The work is a best attempt at this point in time to unpack the large number of issues, concepts and themes involved in planning, designing, equipping and managing VET facilities today. There is no 'correct answer' to the question of what are the impacts of 'clicks on bricks', but many answers influenced by a huge range of circumstances, objectives, and resource variables. It is the responsibility of those in decision-making positions, in consultation with the stakeholders that they serve, to determine the 'best' combination of facilities, technology and professional resources to meet the needs of those stakeholders. This project to identify the range of factors involved will hopefully assist those decision makers in meeting their responsibilities at such exciting and challenging times in vocational education and training in Australia and the world.

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http://www.flexiblelearning.net.au/clicks/index.htm

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Impact of Clicks on Bricks

BEST PRACTICE PRINCIPLES*

Planning principles

Process Preparation	**Successful planning requires time, expertise and commitment**
Strategic Planning	**Planning should address strategic issues of the organisation and be supported with action plans to achieve the vision through the selected strategies**
Needs Analysis	**Facilities and ICT plans should be based on thorough needs analysis methodologies**
Context of workplace and home	**Plans must recognise the evolution of workplace and home learning**
Internal Environmental Scan	**Planning must incorporate initiatives and constraints from the Internal Environment**
Current Assets	**Starting from review of the current asset base in planning can point out mistakes of the past, needs of the future, and opportunities to reuse rather than build new.**
External Environmental Scan	**Plans that include a scan of what others have done or are doing can provide learning opportunities and reduced error**
Opportunities	**New technology developments provide opportunities to address user needs**
Consultation	**The best plans are realised when the widest possible range of interests are included in determining the vision, commenting on methods to achieve the vision, and providing input on outcomes of the plan**
Balance	**Planning must include a balanced assessment of the facilities and the ICT components against the programmatic requirements**
Creativity	**Plans that allow for creative input can move an organisation further than normal expectations**
Benchmark	**Plans must include quantifiable and/or qualitative measures to establish performance expectations**
Financial Analysis	**Planning must include analysis of the various components and recurrent costs as well as capital costs associated**
Facilities management plan	**Facilities management plans should be in place to attend to the ongoing support and operation of the facilities**
Guidelines	**Plans should attend to established guidelines and standards for ICT inclusion**
Integration	**ICT and facilities planning should be integrated into a systemic whole**
Site Selection	**Building or facilities location is based on many variables**
Planning Cycles	**Planning cycles should take into account near term, mid term and long term factors**
Staff/HR Planning	**Plans should address staffing needs as well as the physical and procedural aspects**

* Extracted from BEST PRACTICE PRINCIPLES AND GUIDELINES: Impact of Clicks on Bricks: Principles for VET facilities planning in an information age, Prepared by: Jan Whitaker et al, January 2002, Department of Public Works and Services , PMG/Programs/Education Facilities Research Group for NSW Department of Education and Training (TAFE)

Design Principles

Access	**Facilities and programs must be designed for easy access by people with varying capabilities**
User Needs	**Facilities and ICT systems must be designed to support the educational program and associated services identified as user needs in the strategic plan**
Environment	**Facilities and ICT systems must be environmentally 'friendly', sustainable, safe and comfortable for users**
Flexibility	**Facilities and ICT systems must be flexible and adaptable for multiple purposes**
Future	**Facilities and ICT systems should accommodate future changing needs**
Fit	**Facilities and their supporting ICT systems are part of a community**
Management	**Systems supporting facilities and ICT scheduling must support the flexible uses and match the user needs to the facilities available**
Integration	**ICT capabilities must be part of any facilities design planning**
Technology	**ICT systems can be designed into facilities to support safe, secure and flexible environments**

Technology Principles

Adequacy	**ICT structures must be adequate to meet the needs identified in the strategic plan of the organisation**
Functionality	**The ICT solutions determined must function to support the activities and needs of the users of the facility**
Interoperability	**Infrastructure must maximise the potential to interoperate with other institutes and entities, without degrading the functionality required**
Priority	**ICT must be appropriately deployed in accordance with the strategic plan**
Reliability	**ICT must be reliable in order to be acceptable for program delivery**
Skills/ Knowledge	**Both ICT and Facilities Management are specialised fields of expertise**
Value Adding	**ICT is a valuable asset for program delivery and community development**

Business Principles

Asset Management	**Complex assets and facilities management must be professionally performed incorporating standard good practice in maintenance, acquisition plans and disposal plans**
Contracts	**Arrangements for leasing, buying or selling facilities and assets by the VET provider require clear, agreed, and achievable contracts**
Outsourcing	**Outsourcing may provide increased flexibility and reduced costs**
Control	**Control of facilities and assets is a shared activity involving new players**
Coordination	**Facilities and asset management can benefit through sharing of experiences across wider sectors**
Funding/ Finance	**Funding and financing for facilities and assets must be strategic, flexible and evolving to meet the changing circumstances in the environment**
Ownership	**Facilities and assets may be acquired through a variety of options**
Partnerships	**Partnerships in facilities can extend and improve the use of investments and distribute the responsibilities over a wider range of organisations**
Staffing	**Proper staff selection and professional development support can lead to better program outcomes, including facilities and asset management**
Utilisation	**Maximum utilisation of existing facilities and assets reduces the need for additional investment**