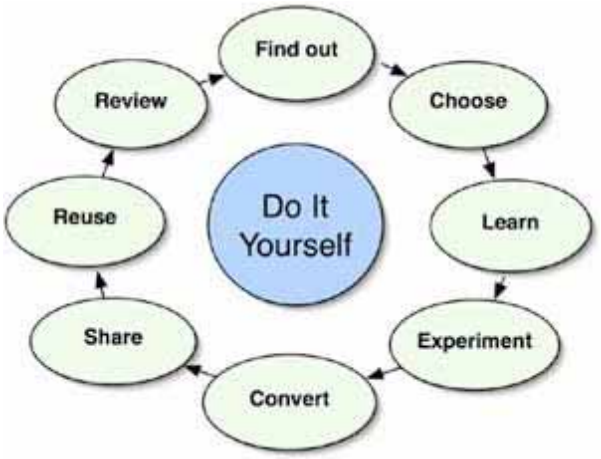
4. An e-learning implementation model

The brief for this project required us to propose an e-learning implementation model so that e-learning practice can be adopted more broadly and readily by trade teachers across the trade spectrum.

The model below is based on the positive experiences of interviewed trade teachers currently using e-learning in their teaching practice.

In proposing this model, we have deliberately simplified the implementation process. We have avoided complex modelling of real life implementation with all its attendant stops and starts, obstacles and successes. The case studies provided in this report reveal the rich experiences of the e-learning pathway. We direct those wanting more real world models to the ICVET research on life based learning.[24]

The model can be represented graphically as:



This model is based on a personal teacher-focused e-learning journey. There is good reason for this. It was clearly revealed in our study of e-learning practice, that if the individual trade teacher is unwilling or unable to embark on the journey, then at a teaching level, it will not happen. However, the same process can be adopted at an institutional level, and in doing so, may ease the load on the individual teacher as these e-learning techniques are tested, adopted and evaluated.

It is necessary to see the e-learning implementation model as a continuous and iterative process, and the points of entry in the process will vary depending on the institutional context and personal skills of the teacher. For instance, some teachers will enter the process when e-learning approaches have already been designated. But designated approaches will not remain immutable: new circumstances will inevitably arise when alternative and new e-learning tools and techniques will need to be tried and tested, and so a new cycle of development and implementation begins.

Although the model suggests a step by step process, in reality there will be circumstances when steps are bypassed. This will particularly be the case when there is a team approach, and individual teachers are assigned different responsibilities in the implementation cycle. Based on our study, there is no doubt that the focussed team approach is the most efficient.

We now explore the model in more detail.

[24] International Centre for Vocational Education and Training (ICVET) research on life based models is reported at: http://www.icvet.tafensw.edu.au/resources/life_based_learning.htm

4.1 Do It Yourself

The Do It Yourself (DIY) model complements the practical orientation of the tradesperson.

Being used to visualising and interpreting and, most significantly, using tools and making things from materials into products, it is 'natural' for the trades teacher to want to do it for themselves. They have been trained in self-reliant practicality.

Although this means trades teachers will need to initially spend more time learning how to use e-learning tools, once mastered, there may be a longer term impact and more rapid spread across a trade department because the skills will reside in the department, not externally. The trades teachers we spoke to were not concerned about this course of action. As one plumbing teacher said; '*I think learning about e-learning is the way construction guys learn – they just hop in, have a bit of a go, see how it works, work out what's not going so well and deal with it.'*

Teachers will learn about e-learning primarily from peers and mentors rather than through formal professional development. The skills will be passed from one teacher to another, mostly informally and in the context of their teaching.

It is also evident in the DIY model that the teachers' materials and communication with students is more relevant, given the teacher is in control of them, and they feel more satisfied with them. They have personal ownership of them. At first, the courseware materials may lack a 'professional' polish. But this was recognised by most of the trades teachers who were intent on improving their e-learning production values. One of the advantages of the *digital* media is that it is relatively easy to refine and improve, whereas print is locked in. Many teachers said that the important step was to 'get the materials out there', and then come back and improve them by adding more illustrations, video or other changes.

Finally, the DIY model may mean that there is more likelihood of faster adoption of new e-learning tools as they become available, and a more open attitude to adoption and experimentation.

As Michael Farrugia from SQIT said, '*Necessity is the mother of invention. Every time I've gone to people and said I need [software] for development … it was too expensive and I got knocked back…. So I found just using basic software that's on everyone's computer, like the basic Microsoft programs, works – so that's how I develop everything'.*

This approach was mentioned time and again in our interviews with trade teachers who have adopted e-learning in their teaching practice.

We have observed a step by step but iterative process that is built into the DIY model, which is represented in the above diagram, and discussed in more detail below.

4.2 Find out: Source information about e-learning

How does someone know what is out there? Where do they go to find out what's out there? Whom do they find out from?

These are vital questions, because a person cannot enter the e-learning field without knowing what the field offers.

Although the internet is a huge repository for new and innovative technologies, there is reluctance by some trade teachers to use it as a valid source of information. It often seems too complex to fathom, and the range of choices too limitless.

Therefore teachers need other ways of sharing this information about what is there, and what works. This appears to happen best through collegial networks, in and around the trade department, the college and then more broadly, through state/territory and interstate/territory networks.

Clearly from our research, nothing happens in a department unless one teacher takes it upon themselves to investigate e-learning, to engage with it, and then become a champion of it. This is even true when the move into e-learning is driven strategically, from the top down.

We found that often the initial impetus at the trade teaching level was stimulated and sustained by a LearnScope project. This project provided the teacher with the time to pursue their endeavour, and then an opportunity to publicise their activities. Through their project, they formed a network of common interest by making contacts with people in similar areas, taking similar steps. They ended up becoming the e-learning expert or champion in their own trade department, college and state/territory or interstate/territory, and a mentor to others. It is around this person that a department's or even institution's strategy to adopt e-learning can be built.

4.3 Choose e-learning tools that suit

There is now a plethora of e-learning tools available, some free of charge and most at significantly reduced cost. For example, near professional quality video cameras can now be purchased for less than $2,000, and video editing software is free.

The range of e-learning tools available is seemingly limitless, and nearly covers every aspect of communication, from podcasting to social networking. Gone are the days when e-learning meant sitting in front of a personal computer and reading text off the screen. There are now mobile phones, portable video conferencing software, digital whiteboards and personal digital assistants. There are many different and often freely available learning management systems.

The general principles when adopting e-learning are:

- horses for courses

  Because of the range of tools available, it means selecting e-learning options that are tailored for a particular teaching situation or solving a particular teaching problem.

- small and do-able

  Because of wanting to do it and manage it for themselves, it's best for teachers to choose small and do-able e-learning options, and use these well, rather than to take on the big system.

We can classify the e-learning software tools:

- Video: video production, video casting, video conferencing
- Audio: audio production, podcasting, audio conferencing
- Multimedia: courseware, digital storytelling, *PowerPoint* presentations
- Animations and simulations

- Automated assessment: quizzes, multiple choice, drag and drop, problem-solve
- Games
- Social software: blogs, wikis, self-managed repositories
- Management: *Blackboard-WebCT, Janison, Moodle*.

We can also classify the range of e-learning delivery options:

- Computer-based: internet, intranet, CD-ROM, DVD
- Mobile devices: *iPod*, mobile phone, PDA, game devices
- Digital display: data projector, digital white board, *PowerPoint* presentation
- DVD.

The tools will mix and match with the delivery options depending on the learning circumstances. In some cases, this selection may even be related to the personal style of the teacher, and not necessarily be a generalised option that is rolled out across a department or an institution.

In our study there was a rejection of large and difficult to use centralised systems. This was most evident in the shift from the larger licensed LMS such as *Blackboard* (*WebCT*) to the open source *Moodle*.

We also observed that in nearly all successful e-learning in the construction trades, the e-learning was conducted in a blended environment. In other words, the training was always in a classroom (sometimes mediated through video conferencing) and the e-learning tools and systems were used in this context. However, the fact that much of the content was online provided an option for the student to access this material outside the classroom if they wanted.

The exception to the above was in the delivery of short courses totally online by an industry association such as Blue Dog Training, a private RTO.

Overall, e-learning has become a much more personalised delivery. If we remember the 1970s and 1980s, the discussion was focused on educational radio and TV stations; now the attention is on personal devices such as the *iPod*, PDAs and the mobile phone.

The latest development on the internet is where the audience is the content creator (*MySpace, YouTube*). This model is being applied in teaching practice, where the student becomes the content creator; for example at TAFE SA Marleston campus where the students use video to record themselves handling power tools.

4.4 Learn and seek support from mentors, management and IT

Despite best intentions and enormous energy, one person cannot by themselves shift e-learning from the margins to the mainstream across a trade or college. This is because despite the e-learning tools being much cheaper, they still cost money, and student access to digital technologies is key to success. Therefore, budgets do need to be committed to technology support.

Where e-learning has flourished across trades and courses, it is generally where there is at least middle management (budget) support and a flexible learning centre that can assist in the mentoring and skills development. If the top level management has incorporated e-learning in their strategic plan, there are even more productive consequences.

Having a person who can mentor and work with teachers, who can actually sit down and talk 'tradie talk', and be sympathetic to their needs, significantly improves the e-learning implementation.

One person said of a colleague who had assumed the role of mentor*: 'He's been able to identify things that will attract them because he's been a teacher himself – things like the marking benefits, and being able to take video and photos of themselves and their areas and put them up so guys recognise them and everyone then has ownership. That's pretty critical getting an in with the teachers.'*

It is interesting to see how many trade teachers and institutions are now adopting open source (free) technologies and smaller and more adaptable systems. This means there needs to be a willingness within the IT departments to install these systems and some programming knowledge to make them operational.

It also means that IT departments need to adapt to the new circumstance where teachers want to adopt technologies and experiment with them. Some IT departments are loath to do this, as they worry (often unnecessarily) about security and viruses, etc. Larger and centralised institutional IT infrastructure is easier to implement and control. However, the model that is favoured by the trades teachers expects a supporting role from IT, assisting when things go wrong, not restricting and controlling the movement into the new technology.

Sue Goodbourn from the University of Ballarat (TAFE) puts it eloquently, *'If teachers are let go, then they come up with the most amazing things'.*

4.5 Experiment and adapt e-learning tools and teaching practice

A big step in engaging with e-learning is overcoming the fear of computerised/digital technology. This is particularly true with the older age group of teachers, who have not grown up in a digital environment as the younger generation have. However, once it is realised that nothing can really go wrong, digital literacy is achieved quickly when support is on hand.

The next step is to adapt the e-learning tool to the teaching requirements. Tools may be used in a way they were not initially designed for. We found many examples of this, where the technology is used differently in different situations.

There needs to be time and space made for experimentation. The University of Ballarat has adopted this approach. Terry Lloyd, Deputy Vice Chancellor, Vocational

and Further Education, said their approach has been *'to let people play about for 12 months, to first become relaxed with no pressure placed on them to use e-learning tools. Then, from this, let champions emerge'.*

Not everything will work. Not everything will turn out as planned. Some technologies will not work in a given context, and they will need to be given away for something else. For example, Simon Brown, from TTSI (Brisbane North), tells in his case study how he experimented with podcasting and found that for his students it didn't work.

The availability of open source and often free e-learning tools has been a real catalyst for experimentation. A major advantage is that if smaller and more flexible technologies don't work in the situation as expected, they can be easily jettisoned and the team can move on. No-one is locked into long term contractual and licensing obligations and this encourages experimentation.

4.6 Convert and chunk pre-existing learning materials

Most teachers have existing materials that are used as handouts to students or in visual presentations. These can be used as the basis for the development of digital materials. The DIY approach encourages using existing materials, adopting and adapting them, and refining them as teachers become more confident with the technologies. The beauty of digital technology is that it is able to be continually refined, without a great cost other than time.

We also found that trade teachers were adopting a 'learning object' approach to e-learning without consciously calling it such. They want materials that suit their particular requirements, their students, their way of teaching. They were not interested in large, ready made and intact courses. They wanted illustrations, animations, slides, digital handouts – 'objects' – that they could insert into their teaching materials.

Some teachers are using e-learning as an opportunity to revise and revitalise their older materials. In one case, some of the materials had been developed 25 years ago. Times have moved on, both for the teacher and student, and the new technology opens up new ways of re-purposing the material into new and more interesting forms.

It was revealed that for a lot of trade students, literacy is an issue. Trades teachers are utilising a number of audio-visual technologies to respond to this: through animated *PowerPoints*, audio embedded in online materials and a much more prevalent use of video. The idea that e-learning is about reading text off the computer screen could not be further from reality.

One person interviewed said; '*The key driver [for using video] for us is engagement of apprentices and trainees. Most of the trade areas have gone down the flexible model … but they have mostly been self-paced workbooks which at the time we thought were good. But now we realise that they are a pretty poor learning model. Apprentices are bored out of their brain sitting in a classroom working from work books, all doing different things, with very little 'community' – very isolated, and pretty unmotivated. One of the major drivers for us without losing the flexibility was to bring some energy and engagement into the process.'*

However copyright is an important consideration in all this. There are strict copyright provisions about use of materials – particularly diagrams, drawings, and illustrations that may have been photocopied from long forgotten sources. These sources need to be tracked down carefully if they are to be used, and permission gained for use,

with the appropriate acknowledgment given. Some TAFE institutes have departments that can help in this regard (eg RMIT). Some states/terrirtories have very strict rules about who should use their material, New South Wales in particular.

4.7 Share materials and knowledge

The efficiencies in e-learning are gained by sharing resources, across trade departments, across institutes and even across state/territory borders.

For example, we found a number of examples of teachers pairing with others in their department, or another teaching area or centre of the institute to develop e-learning resources. We found cross-institutional sharing and development also occurring within different discipline areas. Sometimes these collaborations came about through formal arrangements, and other times it happened informally through serendipitous connections. *'We got some materials from Logan … who generously gave us a CD with assessment on it,'* said an interviewee from Victoria who claimed this gave them the start which led to them getting their own modules together.

As part of this sharing endeavour, building and construction trade teachers have developed a number of networks. These are:

> The Construction Teachers Network (CTN) established in 2005. Teachers realised that there were no resources available with the new Training Package, and this was an idea to share their resources. Shane Wright at Box Hill TAFE manages this. S.wright2@bhtafe.edu.au
>
> TAFE NSW Construction Trades Community of Practice. They have a space on EdNA Groups to meet and share information and resources. '*The aim is to allow uploading of draft materials for feedback, comment, vetting, sharing, etc. before files are uploaded to the CAVN repositor*y'.(Robert Young, Coordinator) robert.young@tafensw.edu.au.
> http://www.groups.edna.edu.au/course/view.php?id=826
>
> NPSTAG Online Network – The National Plumbing and Services Training Advisory Group have created an online space for all plumbing lecturers across Australia and New Zealand to share and support, teaching, learning and work practices in an innovative networking environment. Contact is Alex Shearer alex.shearer@tafesa.edu.au http://npstag.brightcookie.com

Other e-learning networks, not specifically for trade teachers, but of value to learn about e-learning methods and tools include:

> Networks (various) managed by the Framework's E-learning Networks Project http://www.flexiblelearning.net.au/networks

A good example of this sharing is demonstrated at the University of Ballarat (TAFE) which places all resources developed within the institute on their intranet for all teaching staff to use. Not only has this provided efficiencies and economic savings in development, it has also eliminated wastage that occurs when staff leave, taking with them resource collections developed over many years, and wastage when resources are left idle in filing cabinet drawers.

However, when sharing materials, it is important that copyright and ownership is cleared before use, particularly across institutes or state/territory borders.

4.8 Re-use materials

The great potential of digital resource material is that it is not only easy to store and retrieve if properly managed, but more importantly (as compared to print resource material) it is easy to modify or edit and distribute.

Print materials are wasteful in that there is a lot of duplication, and they go out of date quickly.

In addition to teachers repurposing their own materials and sharing and adapting resources developed by others, there are other resources such as Toolboxes and the learning objects available through the Toolbox Learning Object Repository.[25]

4.9 Review the approach

An important part of the DIY model of e-learning is experimentation, and therefore there needs to be an inbuilt *review* process.

Evaluation and refinement processes should be built in to any development project, just as it is now a matter of course to evaluate teaching and learning programs. It is part of quality management, but it is also an essential part of learning, modifying, and perfecting what we do.

There are a number of stakeholders to consider when reflecting on how and when feedback and the involvement of others should be sought. Potential stakeholders include:

- students (or potential students)
- teachers
- the institution (represented by management views or policy)
- employers.

It is important to consult with students when considering new approaches to resource presentation or teaching and learning methods. Students can provide feedback at the beginning of the process when exploring or testing new ideas; during development to check it's working for them; and after a period of time to see if approaches are working as intended.

Students can also provide valuable information on the context of their learning, work, and study circumstances that may affect choices or ultimate results. For example, this may concern the technologies they may or may not have access to. Or, it could relate to their learning preferences; for example 'auditory' or 'visual' learning – as was the case in the TTSI (Brisbane North) where podcasting was not what students wanted.

As Stephen Parker from the University of Ballarat (TAFE), plumbing says, *'understand what the students want.'*

Teachers can provide valuable feedback and support. Many of the teachers we consulted used peer review as a means to test ideas and to refine what they do.

[25] For information about Toolboxes and the Toolbox Learning Object Repository see: http://www.flexiblelearning.net.au/toolboxes

Some use online networks for this purpose, others form local networks or team with others in their institute or in other institutes.

Many teachers are now adopting the approach that it is better to produce materials quickly and refine them over time.

Gaining institutional buy-in at the beginning is the best way of ensuring materials developed or new teaching approaches used fit with the organisation's expectations, and have support during the development and delivery phase, and beyond.

Most managers are keen to measure outcomes of any teaching intervention. Establishing how this might be done very early in the process, in consultation with management is important.

Employers also have an important bearing on change, and therefore need to be included in the review process. To bring in new teaching methods and gain employers' support, it is necessary to convince them of the benefits. In the TTSI (Brisbane North) Simon Brown found that showing employers examples of what he was planning and doing won them over. He consults with employers and seeks their feedback continually.