

Supporting a Community of Enterprise Educators: The TE3 Project

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ABSTRACT

The Technology Enhanced Enterprise Education project (TE3) was set up to promote the use of learning technologies in the teaching and learning of Enterprise and Entrepreneurship in the West Midlands. Since its creation in August 2003, TE3 has helped over 5000 students learn about enterprise and has involved over 500 members of academic and academic-related staff in partner institutions. TE3 supports a community of enterprise educators by providing funds for the development of on-line materials, research into enterprise education, or for teaching and learning events, and by making materials developed with TE3 funds available to all partners to download, adapt, and use for educational or research purposes. This paper describes the formal processes and procedures underpinning TE3 and comments on the lessons learned and added value outcomes experienced by community members.

Keywords

Enterprise, entrepreneurship, learning technology, repository, community of practice

INTRODUCTION

Learning about and experiencing enterprise whilst still at university can have several benefits. It gives you an alternative career option and the confidence that you can set up your own business or social enterprise. Graduates, academic staff, and research students often have ideas that can be taken forward into high-technology enterprises; enterprise skills training can help make this happen. Enterprise skills will also be useful to those who will become self-employed and work on a freelance or consultancy basis.

Regardless of career intention, enterprise education can encourage those who take part to reflect on their particular strengths, weaknesses, and key values. It can help address practical skills such as oral and written communication, and personal effectiveness skills such as being creative, being able to influence and negotiate, and being flexible and open-minded.

In 1999, a network of twelve Science and Enterprise Centres (SEC) were set up in UK Universities to promote the teaching and practise of commercialisation and entrepreneurialism in science and technology (Office of Science and Technology, 2002). A further SEC, the Mercia Institute of Enterprise was launched in 2001 and now comprises of a consortium of 12 Higher Education Institutions with the common objective to promote Enterprise and Entrepreneurship in the West Midlands (see Mercia Institute of Enterprise, 2005). One of the main areas of activity for the MIE is the teaching of enterprise and entrepreneurship. The Technology Enhanced Enterprise Education project (TE3), based at the Learning Development Unit of the University of Birmingham, forms a major part of this activity with the remit extending to all subject areas.

This paper will introduce TE3 project and describe how a partnership of enterprise educators, with an interest in the use of learning technologies, was set up and how it is now a community of practice. Particular reference is given to the support of a content store of digital materials, what lessons have been learned by educators producing materials, and what added value they feel they have gained from being part of TE3.

THE TE3 COMMUNITY

TE3 provides funding to develop materials and enhance enterprise education through the use of learning technologies in partner institutions of the Mercia Institute of Enterprise (MIE) in the West Midlands. The TE3 partners are: Aston University, University of Birmingham, University of Central England in Birmingham (UCE), Coventry University, University of Keele, Open University, Staffordshire University, Warwick University, University of Wolverhampton, University of Worcester, Harper Adams University College, and

Newman College. TE3 is hosted in the Learning Development Unit of the University of Birmingham and is funded by an award from the Office of Science and Technology to the MIE as part of the Science Enterprise Challenge scheme. TE3 started in August 2003 and is due to complete in July 2006.

Since 2003, TE3 has helped train over 5000 undergraduate students and 350 postgraduate students across the West Midlands; 500 academic and academic related staff are closely involved with TE3, or have attended TE3 events. Enterprise academics who are part of the TE3 community are supported by access to the TE3 website, an electronic maillist announcing new projects, new materials ready for download, and workshops and other events related to enterprise education.

Is TE3 a Community of Practice?

Wenger (1998) suggested that informal communities of practice emerge as people pursue shared enterprises over time. He gives a 14 point checklist of indicators that a community of practice has formed (p.125). These include: sustained mutual relationships; shared ways of engaging in doing things together; specific tools, representations, and other artifacts; and local lore, shared stories, and inside jokes. Wenger argues that demonstration of the 14 characteristics indicate that the three dimensions of a community of practice - mutual engagement, a negotiated enterprise, and a repertoire of negotiable resources accumulated over time - are substantially present.

In his 1998 book, Wenger states that a community of practice is different to a task force or a team in that it does not have clear launching and dismissal dates. A community may not form for some time after an official task start date and may continue after the tasks formal end. This may suggest that a community of practice is an informal entity and cannot be formally created. Wenger, McDermott and Snyder (2002), however, use a cultivation analogy to argue that although a seed may grow independently of whether it has been hand-planted or is self-seeding, there is much that can be done to encourage seeds to take root and grow in healthy plants; as 'cultivations' and 'interventions' can be carried out by organizations, they could be said to have a formal component. In a further definition of a community of practice, Triggs and John (2004) use the concept of a collection of individuals bound by both formal and informal relationships sharing common practices and activities. Thus, TE3 is a community of practice, exhibiting both formal and informal aspects, and exhibiting characteristics making up each of Wenger's 1998 three dimensions. For example, the TE3 community demonstrates mutual engagement and a negotiated enterprise (see Processes and Procedures below) and a repertoire of negotiable resources accumulated over time (see Processes and Procedures and Sharing Materials). Note that this paper will concentrate on the more formal aspects and interventions of TE3 to initiate, support, and facilitate a community of enterprise educators.

PROCESSES AND PROCEDURES

Governance

Formally, TE3 is governed by a contract between the University of Birmingham and Warwick University which hosts the MIE. The day to day running of TE3 is overseen by a steering group made up of representatives of the MIE and each of the 12 partner institutions. Several steering group members are also TE3 project managers (see TE3 Projects below). TE3 processes and procedures are agreed by the steering group at quarterly meetings and are entered into a project specification document which acts as a working constitution. The first version of the project specification document was created based on one-to-one discussions with key contacts at each of the partner institutions before the TE3 project formally commenced, taking into account their needs and aspirations.

TE3 Projects

Each of the 12 university and university college partners can apply for funding for institutional projects, up to £10,000 per financial year, to produce on-line materials, tasks, and activities linked to an undergraduate or postgraduate level module. The funds must be matched with head of department or budget holder support. Project managers can apply for funds to buy out staff time, buy in expertise from outside their school or department, to purchase specialist software, or to provide training for the project team. The staff time required to complete the project is recognised as critical to the success of the project and funded accordingly; matched funding ensures institutional buy-in to the project.

In 2004, further funds were made available for special projects such as collaborations between institutions projects, for small innovation projects requiring smaller awards or research into enterprise education, and for grants to support enterprise related teaching and learning events.

Applications for project funds are submitted to the Head of TE3 who works with project managers before forwarding a final draft to the Project Fund Approval Group, made up of three members of the TE3 steering group and an external consultant. Successful applications receive half of the award in advance with the final half forwarded on completion of the project and hand-over of deliverables.

Project managers are required to complete quarterly progress review forms where delays or problems with the project can be recorded; revisions to the project timescale and deliverables can be re-negotiated once identified with the progress review forms. In addition to monitoring project progress, the review forms allow project managers reflect on their experiences of both the management of their project and their use of learning technologies. Managers are encouraged to note the lessons they have learned and if the project has provided any additional or unexpected benefits (see sections on Community Learning and Added Value below).

There are currently about 40 TE3 projects involving all 12 partner institutions. Three projects involving cross-institution development of materials have been set up between Birmingham and Aston; Aston, UCE, and Harper-Adams; and UCE and Newman College.

Community Learning

The section above described how project managers are asked to reflect on the lessons they have learned as a result of their involvement with TE3 in regular progress review forms. The following points summarise the learning points noted by project teams.

- Materials take more time to develop than originally envisaged
- The use of technology often provided unexpected benefits
- Evaluation of materials and the projects themselves is useful at each stage
- Working with entrepreneurs is difficult as some can be reticent and shy about their achievements. On another level, useful learning points for students may not show an entrepreneur as they see themselves. Learning resources should show both the positive and negative aspects of setting up an enterprise, but this can be uncomfortable for the entrepreneurs the resources are based on.
- Resources can be repurposed and have multiple applications.
- Considerable effort is required to provide student feedback and develop interactive components.

Meetings such as the TE3 Open Day and other dissemination events are organised to give project managers and other community members the opportunity to meet, share their experiences and learning points, and demonstrate the materials they are developing. Educators at partner institutions can apply for TE3 funds to support events on aspects of enterprise education of interest to them. This has led to an increase in knowledge of e-learning practice within the community and has fostered additional partnership working outside the formal TE3 remit.

In addition to TE3 organised events, project managers are required to identify routes of dissemination within and outside their institutions as part of the application process for funds. This helps create a culture in which enterprise education is promoted within individual institutions and the region, but also acts as an advertising tool for enterprise education materials.

Added Value

A section on each progress review form and the final end of project form asks project managers to reflect on any unexpected outcomes that have added value to the project. The following added value outcomes were suggested by project managers:

- Conference talks, journal articles, and newsletter articles on project outcomes
- Increased research output
- Increased links with small firms
- Linkages between academics and educators that would not otherwise have arisen
- Increased expertise and knowledge

- Improved resources for students and increasing student skills

Thus, it would appear that being part of the TE3 community has provided benefits, above and beyond the production of learning materials *per se*, for educators as individuals, their students, and their institutions.

Of particular relevance to community of practice as a theory of learning (c.f. Wenger 1998) is that there is a self-reported increase in expertise and knowledge. Such learning evolved out of TE3 and the community itself by encouraging reflection on lessons learned, providing funds for staff training if required, encouraging evaluation and dissemination of outcomes, through self-initiated contact of community members or through TE3 facilitating or providing financial support for events for partners to meet and share experiences. TE3 did not impose or expect a training regime to be set up in partner institutions, and increasing skills sets was not a stated aim or expected outcome of TE3.

SHARING MATERIALS

Materials produced by TE3 funded projects are available for free and unfettered use by all partner institutions for research and educational purposes. Each application is sponsored by a Head or School or budget holder who signs to agree a copyright statement to this effect. The materials are available for download from a password protected site with restricted access to members of staff at partner institutions on application. This allows TE3 to monitor use of materials and notify account holders if any materials have been altered. Access is restricted to staff as some of the materials include information on assessment and feedback.

Technical issues

Interoperability standards have been used where possible. For example, appropriate quizzes are made available using IMS QTI. However, making all materials available for download across different virtual learning environments and platforms has not been a trivial process – for example, content packages developed in one platform, such as Blackboard or WebCT, are not always easily interoperable with other platforms and materials often need to be re-written by TE3 to make them available for sharing. In order to provide at least one way that most of our potential users can have access to TE3 materials, structured content is provided packaged as IMS CP with RELOAD, packaged for WebCT, and is provided as a zip file of HTML pages with ordered, numbered filenames and an index page showing any sections and sub-sections. We have not yet found a solution to providing resources for immediate content package plug-in into the Blackboard VLE; Blackboard users currently need to download the HTML and index page zip file.

As with all learning technologies (Davies and Smith, 2006), one of the barriers to use of TE3 materials is lack of technical knowledge of potential users (see also ALT/SURF, 2004); technical knowledge and availability of support may vastly differ between individuals and institutions. A question asked of me more than once when I am encouraging an enterprise academic to encourage them to download and adapt TE3 materials is “What do you mean by download?”. TE3 therefore works closely with community members and provides help in various ways including advising on practice, linking colleagues with others across institutions who have solved similar problems, or sitting with potential users, demonstrating materials and providing one-to-one support for download and embedding. Being closely and directly involved with solving problems has led to a greater understanding of potential issues in re-using materials. For example, one institution’s VLE has had links to import and export materials disabled as institutional policy. Academics at this institution may not be aware that it is possible to import materials and, if aware, will necessarily need to involve their IT departments in order to use TE3 resources, potentially adding a further barrier to uptake.

In addition to being a barrier to using developed resources, lack of technical support or knowledge, or even lack of confidence in technical support or knowledge, can be a barrier to undertaking material development. In applying for TE3 funds, potential project managers are asked to identify a team and assess the skills each team member bring to the project. Funds are also available for staff training if required to fill skills gaps. However, it has still proved necessary to receive materials in the form that is best for the developer. Dedicated content packaging software such as RELOAD is not yet commonly used, and expecting materials to be provided in an interoperable and accessible form may not be practical. It may be better to take on raw materials, recognizing that you will need to work on them before making them available to others, than to have no materials at all.

Granularity of Resources

TE3 materials are available in a variety of ways including single case study documents, presentations, flash animations, video clips, zip files of unpackaged HTML pages, or content packages of learning materials. Duncan (2003) suggests that customers want collections of small, reusable learning objects instead of large

monolithic courses. Materials submitted to TE3, however, range from whole courses of related content, tasks and activities, through collections of case studies, to individual video or animation files. Where the materials are in the form of large courses, TE3 packages them in a simple format that can be used as a whole or broken up and used as separate components. Where possible, TE3 itself will help with granularization by providing video clips, quizzes, or animations separately in addition to the course in which they are embedded. Note that the issue of granularity a complex issue that might be a barrier to the production of learning objects (ALT/SURF, 2004) and that careful consideration needs to be given to the needs of your users.

The ALR/SURF white paper (ALT/SURF, 2004) describes two models for producing materials for sharing. In their first example, they suggest that teachers would need to plan for sharing and re-use; in the second, external suppliers would create content and teachers use it. Neither example is ideal and the white paper proposed a potential solution around the concept of 'usability'. It is suggested that sharing might be attractive if teachers can adapt materials and access information about how others have used learning objects.

TE3 may be described as such a third model. Here, project managers apply to create materials to solve a local problem in a local context; it is known, however, that the materials will be used for sharing and that includes other partners being able to freely adapt them for use in a new local context.

TE3 requires project managers to provide a set of teaching notes giving the context in which the materials were used. This helps other potential users to understand how and why the materials were originally used with a particular set of students but appears to go against recommendations that context and content should be separated to create learning objects that are flexible and customisable (see Campbell, 2003). In our experience, embedding of enterprise education within a School or Department's teaching is often context dependent and examples of practice are important to enable enterprise educators to access the relevance of the materials for use with their own students. Context independent objects are provided where possible, but where larger chunks of materials are developed, to support whole courses for example, the teaching notes allow others to consider differences and similarities between the students for which the materials were developed and whether or not changes will need to be made.

Copyright, IPR, and Conditions of Use

ALF/SURF (2004) stated that the need to agree on conditions of use is a significant barrier to the use of repositories¹ and of sharing resources. For TE3, materials are available for staff at partners institutions for free and unfettered use for educational and research purposes; the materials can be altered and adapted as required.

A further, possibly more problematic, issue may be that of copyright and IPR. There are two main issues with copyright. First, developers of materials need to ensure that any third-party resources they include must have permission for use not only in the originating institution, but across all of the TE3 partners. If they are unable to obtain such permission for all institutions, the resource cannot be included. A message is posted within the material available from TE3 and in the project-specific web page providing details and alternatives given where possible.

The second issue relates to copyright and IPR ownership of materials. In many institutions, the IPR of materials produced by academics and educators belongs to their institution and is not personally owned. Institutions may wish to retain materials for commercial exploitation. For TE3, copyright and IPR procedures were agreed in advance of the project start date and is covered by the governing contract. Heads of Departments or budget holders for each project sign to agree to the conditions of use above, and to agree to seek permission of the University of Birmingham (as TE3 hosts) for use not covered in the conditions.

Campbell (2003) suggest that use of metadata can help overcome some of the problems with IPR in relation to learning objects. For example, the IEEE LOM metadata schema provides elements that can record cost, copyright, and basic conditions of use; at the time Campbell was writing, however, it did not cover more complex rights information such as the extent to which the resource can be distributed or whether or not it can be adapted.

¹ TE3 provides a repository in that it provides a content store of digital resources for use to support a community with shared interests (ALT/SURF, 2004). Note that the store does not yet provide metadata searches although such a system is currently under development.

A Case Study of Material Sharing

A small innovation project grant (SIP003) was awarded to Dr James Elliott at the University of Birmingham to adapt materials developed by Dr Francis Greene at Warwick University in a previous TE3 project (TE3010).

The new resource was set up for self-directed study by students registered to attend a Postgraduate Enterprise Summer School (PESS). Students were asked to reflect on their attitudes towards entrepreneurship and enterprise, identify their key values, learn about idea creation techniques, and start learning about the process of taking an idea to market in advance of the face-to-face school. The resource also provided students with links to further sources of training and advice on enterprise issues provided within the University of Birmingham.

The e-learning module developed at Warwick University was designed with video clips, textual information and activities for students to work through and reflect on using 'blogs' (also known as weblogs or on-line diaries). Students could then make their blogs available to a tutor to read and comment on. The webpages were created with SiteBuilder, a bespoke Warwick content management system.

The PESS resource course was based on three of the four sections originally developed in TE3010. Each activity was reviewed for its appropriateness to PESS students and adapted where required. A small number of activities were not considered appropriate and were not included. Only one video clip was used; other video clips contained Warwick Skills Certificate-specific information and were not used. One video clip explaining idea generation was transcribed and the text adapted and added to.

Whereas Warwick students interacted with their resource using blogs, Birmingham students interact via WebCT Vista. Blogs are not included in WebCT, so the activities instead asked students to use the 'MyNotes' facility. The notes are intended solely for a student's personal reflections and are not intended to be shown to a tutor unless the student wishes to print off the notes for discussion.

The Warwick e-learning module contains four checklists or quizzes. These were entered into WebCT for self-assessment and automatic feedback. SIP003 has made these available to other partners as IMS QTI quizzes that can be plugged into several other Virtual Learning Environments (VLEs) or other platforms.

SIP003 also created two animations to support the materials developed for TE3010. First, an animation was set up to explain mind mapping, taking the place of a video clip and PowerPoint slides used in TE3010. Secondly, a TE3010 task asked students to prepare an 'elevator pitch' – a scenario in which an enterprising student has entered a lift with a potential funder and has until the lift stops to pitch their idea. SIP003 used the same task, but provided an animated timer showing a lift going up 30 floors in 90 seconds. The animation told students when to start and stop their pitch. Both animations are playable on request by clicking on a start button; the elevator pitch animation can be restarted if a mistake is made. The animations were created using Macromedia Flash. The animations are provided as Flash Movie files for immediate use, and as the original Flash files so that partners can adapt as required.

The PESS WebCT Vista course has subsequently been copied for further use with the University of Birmingham. It has been slightly adapted and made available to all postgraduate students as a self-registration course containing postgraduate-specific information called "Introduction to Enterprise Skills for Postgraduate Students". It is also available as a general "Introduction to Enterprise Skills" course for all other students and staff.

Various components of TE3010 and SIP003 have been used by other partners in a variety of ways. For example, an enterprise academic at a partner university has used the elevator pitch animation from SIP003 in a face-to-face setting by embedding it into a PowerPoint presentation for students to present 'live' pitches. A second partner university has made the original TE3010 materials available to all students for self-directed study via their VLE.

SUMMARY

The TE3 project supports enterprise educators across the 12 partner institutions of the West Midlands. It uses formal processes and procedures that have been negotiated by key contacts at each institution making up the community. From these formal processes, more informal aspects of Wenger's (1998) communities of practice have evolved, including sustained mutual relationships, shared ways of engaging in doing things together, shared stories, and inside jokes.

TE3 was originally conceived as a way to increase student learning in enterprise and has been successful in this aim. However, we have found that staff have also learnt as part of belonging to the TE3 community. For

example, managers of TE3 projects have reported that their own knowledge and expertise has increased, both in the areas of enterprise and in the use of learning technologies. Other added value outcomes have been demonstrated such as increased research outputs and the creation of beneficial links between academics in partner institutions, with regional businesses, and indeed beyond the West Midlands.

Although TE3 has been successful, it has faced several challenges and barriers to uptake particularly in relation to sharing materials. Barriers have included lack of technical knowledge and skills, institutional responses to sharing of materials, and difficulties with interoperability between learning platforms. In the main, we have been able to overcome or work around such challenges as described in this paper. It has been achieved in a variety of ways and has been helped, to a certain extent, by being able to lay down certain conditions that project managers and their budget holders must adhere to as part of the funding process. However, although the 'lure' of money may have initially helped in some cases, TE3 is particularly beholden to its community of practitioners who buy into the ethos of sharing and mutual support and have enabled the project to grow beyond its original aims and objectives.

Perhaps one of the measures of a successful community is its ability to evolve and maintain itself. The official TE3 project ends in July 2006 and it will be interesting to see if the community is able to self-maintain past this date. The signs are currently promising. The TE3 steering group is keen to continue support for the community through webpages, maillists, and maintenance of a content store or repository for as long as possible and to continue to seek further financial support for the developed of new materials and upgrading of old.

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