

Creating a Collaborative Environment for the Support and Management of Geographically Dispersed Educators

Tim Cappelli

University of Manchester
ERC, Wythenshawe Hospital
Manchester, UK
tim.cappelli@manchester.ac.uk

Abstract: There is a general acceptance that the creation of a learning community with a group of students is beneficial for both students and institution. There is, however, less recognition of the importance of developing communities of tutors and in particular tutors who are geographically dispersed and lack immediate support from each other or their institution. This paper outlines a project in progress aimed at addressing this issue by seeking to create a dedicated, domain specific online environment for a group of dispersed tutors.

Keywords: Online Communities, tutor support, e-learning, collaboration

I. The Problem

Problems associated with e-learning students feeling isolated and lacking support are well documented [1], [2] and much has been written on how to support students by creating and supporting online learning communities [3], [4] and offering e-tutoring support [5], [6]. This research has led to the development of numerous collaborative learning environments that provide a range of communication tools for students, together with tutor practices to support the students online. In contrast, little has been written on the problems associated with isolated tutors. Most works on supporting e-tutors or e-moderators focus on addressing specific skills shortages [5], [7]; few recognise or address the problem of tutor isolation. Yet many tutors who support students online are themselves often geographically dispersed and work in relative isolation [8]. It appears contradictory that so much effort has been focused on the support of students, yet little exists on similar support for tutors.

This is particularly so given the increasing evidence of the benefits of tutor collaboration and the establishment of tutor communities [9]. Coughlin and Kajder point to a small, but persuasive, number of studies that demonstrate a link between collaboration of educators and teacher efficacy and professionalism [9].

They also point to the growing evidence base for a similar link between tutor collaboration and student performance, with studies showing that students who are taught by tutors involved in some form of collaboration, perform significantly better than those students taught by teachers working

independently. There is therefore, a compelling case for educational establishments offering e-learning to provide learning communities for both students and tutors alike.

A. Virtual Environments

The rise of collaborative technologies that have underpinned the growth of online learning and the establishment of virtual networks are ideally placed to provide the perfect environment for tutor collaboration and support. Online Community of Practice models potentially bring together the benefits of Web 2.0 technologies with frameworks for tutor development. Indeed, many examples exist of teachers and tutors establishing their own communities using existing technologies [8], [9]; for example a group of High school English teachers in the United States began an online community in Ning (www.ning.com), with several thousand users subscribing within six months. Other tutors have established communities using online Virtual Learning Environments (VLEs) that they have previously worked in as individuals to support students [9]. However, basing the tutor community on a VLE is likely to be less than satisfactory, since any such tool has been designed to facilitate the support and learning of students, and is not tailored to the needs of the tutors. Attempts have been made to create bespoke environments using a range of communication tools. For example, *Tapped in* was designed by a group of researchers at Stanford Research Labs to support multiple communities of educators, whilst *Global Educator Network* is an online community for online educators in high schools. [4], [9]. Both have some levels of success, with *Tapped in* having over 60,000 members. However, formal environments such as these have failed to capitalize on the benefits of Web 2.0 technologies. Instead informal teacher communities continue to appear in more generic social networking applications such as *Del.icio.us* and *Second Life* [9]. Here tutors often utilize the dual ability of the technologies to support individual work or resource sharing, whilst also allowing social networking and communication. Whilst these tools provide a low threshold, frictionless application that appeal to the users, they may lack the functionality and requirements required to get best value from a community of educators. Consequently, we believe there is a need for a new generation of dedicated tutor-based environments that have been specifically designed

to support the needs of tutors and educators in a particular domain, whilst meeting the tenets of a sustainable community of practice. Our rationale for this derives from the literature and from our own experience with a creating an online community of educators isolated by location and by time-pressures.

B. Background

The problem of dispersed tutors is not limited to e-learning. The Manchester Medical School is the largest Medical School in the UK with an annual intake of around 500 undergraduates. Much of the five year programme for these students is delivered through clinical placements in one of five Teaching Hospitals across the North-West of England. This involves thousands of clinical tutors, spread out across the region. These are doctors and other healthcare professionals who need both support and information from the Faculty, but also need to interact and communicate with each other despite geographical spread and competing demands on their time. The Technology Enhanced Workplace Learning (TEWPL) team are a small research and development unit attached to the Medical School with a remit to develop technologies to support students and tutors in the delivery of clinical training. TEWPL recently completed an 18-month project called HeLMET (www.medicine.manchester.ac.uk/helmet) which created an online collaborative environment based around social networking features [10]. The specific aim of the HeLMET project was to provide this set of dispersed tutors with a tool with which they could contribute remotely to the development of the curriculum.

However, whilst gathering user requirements for the system, it became clear that the tutors wanted more from the system than was originally intended. Although they were prepared to contribute to curriculum development and saw the value of it, they were much more interested in using the tool as

a means of communicating with peers, sharing resources and providing mutual support [10]; in short, the creation of an online community.

Unfortunately, the degree to which the HeLMET project could provide the full functionality required by the tutors was limited by the remit of the project and in particular the demands of the Medical School as chief stakeholder. The project was established specifically to provide tutors with a tool to update the curriculum in a collaborative process. The desire of the tutors to communicate and share resources was deemed by the Medical School, to be counter to the task for which the system was developed. This is demonstrated using an Activity Orientation Spidergram, as endorsed by Wenger, White, and Smith to determine the current state of a community and to plan the future direction of the community [11].

The two spidergrams are based on a series of workshops and interviews with end users (clinical tutors) and project sponsors (Medical School Managers). Both groups were asked what value an online community would bring and what type of activities they would like to carry out as a community member. Figure 1a. represents the responses of tutors, whilst Figure 1b. represents those of the Medical School managers. It is clear that there is significant divergence between what the School felt the purpose of the community was and what the end users wanted. Managers clearly felt the primary purpose of the system was to carry out the project of curriculum development and allow individuals to participate in that work. Tutors were much more interested in building a thriving community where they could share experiences, practices and resources. There were several examples during the project of users requesting certain features or permissions within the system, only for the request to be vetoed by the project sponsors.

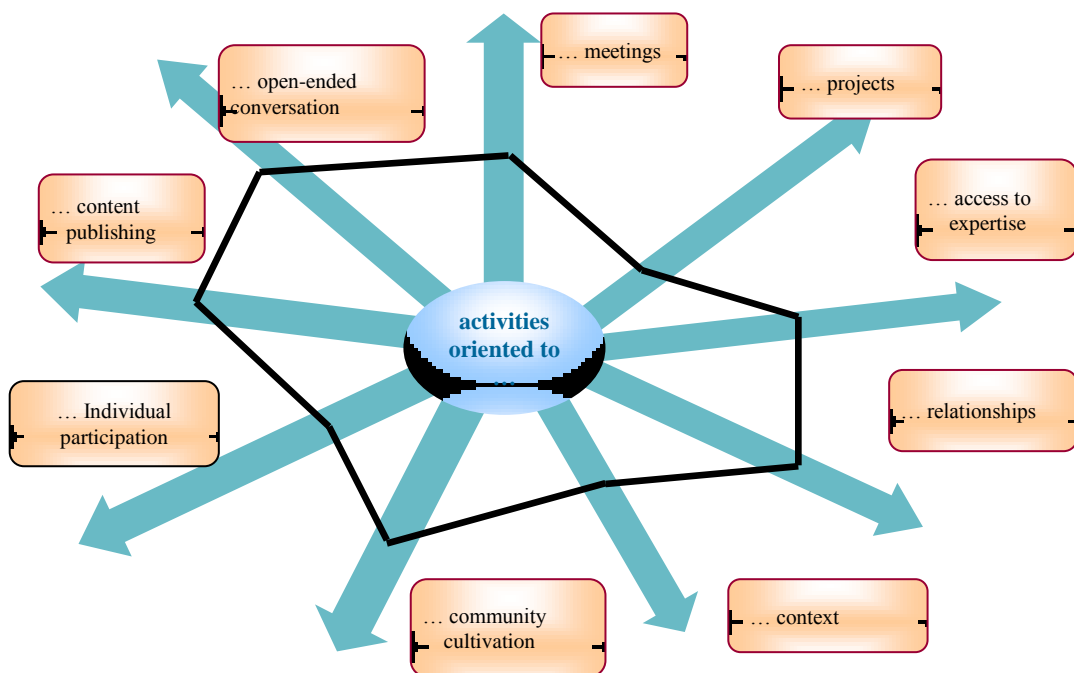


Figure 1a. Spidergram of Tutors requirements of an online community

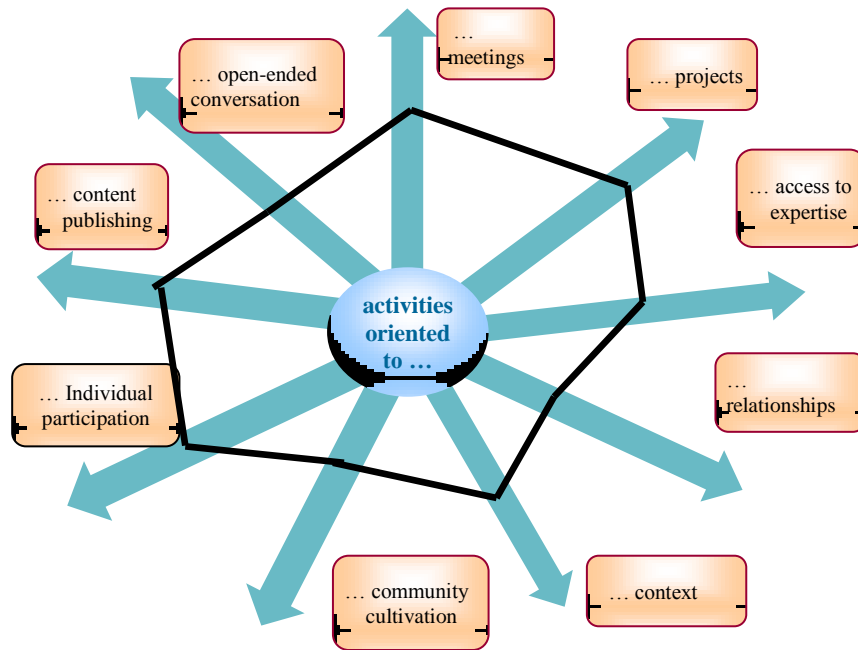


Figure 1b. Spidergram of Medical School Managers' requirements of an online community

In this situation, the system's functions were driven by the demands of the Medical School who were sponsoring the project, and their requirements for the tasks to be completed. To this end the system structure was based on groups of tutors, each with its own area of curriculum to consider, set in a wider community of multiple groups. The community thus had a specific purpose or set of tasks. This type of community is described by Reil and Polin as a 'Task-based community', that is "groups of people organized around a task who work intently together for a specific period of time to produce a product" [4]. The resulting tool, called *ellaborate* (www.ellaborate.org), provided a collaborative editor embedded within a social networking tool, constructed around groups and tasks [10]. Members of the network could find and contact each other, and to a limited degree, share information and resources, but the community remained very much task-focused. Though this community become relatively well populated, usage remained low; it never achieved the vibrancy and sustainability of a true learning community.

One of the inherent problems of a task-based community is that it naturally comes to an end with the completion of the task or the creation of a product [4]. New tasks require new groups and any continuation of the knowledge generated through completion of the task is reliant on being carried by tutors into the larger community. For this to happen, the environment must not only support communication and networking across the larger community, but also the ability to record, store and retrieve learnt practices [9]. Several examples exist where the members of the smaller, task-based groups within such an environment propagate their knowledge through membership of new groups or reflection on their tasks [4]. However this requires the group to focus, not just on the task in hand, but also the process of completing it; as Reil and Rain point out "The transformation [of a task based community] to a learning community requires the development of group goals focused intentionally on a

learning outcome" [4]. No such goals were expressed in *ellaborate*, nor were there mechanisms to facilitate this, and it was clear that users were completing the task required of them, but failing to engage as part of the wider community. Evaluation of the tool demonstrated that the constraints of the system meant tutors felt there was little or no value to them in remaining part of the community once the required task was completed. There was also no encouragement or incentive for tutors to participate in, or feel that they belonged to, a wider community. Studies into tutors' motivation for participating in online communities stress the importance of that sense of belonging [9] and also the relevance of the community to its members' needs [8]. Although it often takes time for community members to recognize the benefits of an online community, the fact that tutors on this project expressed a desire to collaborate and share practices pointed to the technology as the limiting factor. Evaluation of the tool reinforced this, with users expressing frustration that they were not sufficiently able to express and share certain educational practices.

There was clearly still a latent demand for a much broader type of community, where members could share, communicate and provide mutual support; what Reil and Polin describe as 'Practice-based community' or "groups with shared goals that offer their members richly contextualised and supported arenas for learning." [4]. *Ellaborate* was clearly not best placed to facilitate this type of community. The question was, could the establishment of such a community be served through other existing technologies and would the establishment of such a community have immediate benefits for the organisation?

C. The Challenge

The work of HeLMET was not taking place in isolation, and the University was already using existing systems to

communicate with, inform and motivate this group of tutors. As well as ‘traditional’ email groups, there was also the use of the Medical School’s learning management system called Medlea. Medlea was developed to provide timetables, curriculum information and general announcements, primarily to students. However, it had also become the de-facto mechanism for communicating with tutors, yet provided little or no means for tutors to communicate with the School or each other.

Wilcox describes this model of communication and ‘membership’ as a hierarchical arrangement with the host organisation at the centre and the members connected to the centre [12] (see Figure 2: *Join us- our list*).

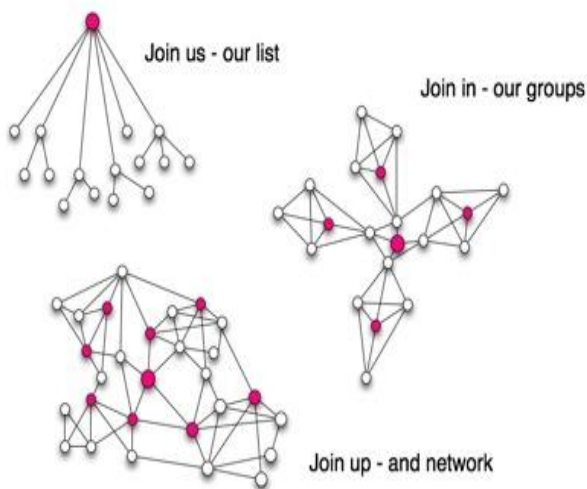


Figure 2. Representation of organisational networks

In reality, informal and formal networking and communications were already taking place between tutors within each of the teaching hospitals, so the model represented much more a set of groups, with the Medical School at its centre (see Figure 2: *Join in- our groups*). This was the model that *ellaborate* mirrored, with the groups focused around a task rather than a location, but with limited or no communication between the groups in the wider community [10].

What Wilcox and Shirky both argue is that to have real value to its members and to the host organisation, any community must be able to connect laterally, i.e. member to member, and that the host organisation must become the facilitator, and component of, this community rather than its central focus [12],[13].

Building such a community has many potential benefits for the organisation and its members. Firstly members would be able to exchange and locate knowledge more easily, both reified knowledge that exists in policy and curriculum documents issued by the University, but also participative knowledge actualised through the sharing of practices and stories [4],[14]. Such participation in a community would lead to a more motivated and responsive membership [14] whilst also providing a community-regulated standard of practice [4] that helps prevent variations in curriculum delivery. The network could also act as catalyst for change [13] and the development of new practices [4],[9] which has been partially demonstrated through use of the *ellaborate* tool by tutors [15]. As stated at the start, there is growing evidence

that participation in a thriving and collaborative community of tutors has a beneficial effect on teacher efficacy and student achievement [9]. The challenge was for the Medical School to recognise the benefits of facilitating such a community and then realising these benefits through the leverage of appropriate Web 2.0 technologies.

Recently the Medical School has undertaken a major review of the medical programme; both its content and its delivery. It has become apparent through this review that this dispersed group of clinical tutors, so crucial to the success of the programme, are not being well served by the current mixed set of limited technologies. Realising this, the Medical School has tasked TEWPL with creating a single system that combines the functionality of the existing tools and extends them to meet the requirements of the educators to create a true ‘practice-based learning community’. The development of this tool will create a dedicated environment, bespoke to the requirements of isolated tutors, that provides them with direct access to support and information that is key to their practice. The tool itself will be created around the needs of medical tutors, but will be generic enough to be applied to any set of dispersed educators. This community may be based around a single institution or even a single course; alternatively it may be cross-institutional, serving a common subject domain. The challenge lies in developing a system that fulfils this need.

II. The Solution

A. Choosing a Technology

The development of successful online communities of practice requires more than just use of the appropriate technology [8],[16]. However, as the example above demonstrates, having inadequate technologies can prevent a community from growing and maturing if it fails to provide the functionality required by the members. The choice of technologies and system functions is often critical to the successful development of an online community [9],[16].

There are a multitude of Web 2.0 technologies available to potential communities of practice, though most spontaneous communities choose software that provides a basic suite of communication tools [16]. This need to communicate is clearly a basic requirement for any community and particular a community of practice where learning derives from sharing and discussion of practice. However, Reil and Rein state that communities of practice must be able to do more than simply communicate; ‘*Communities require channels for communicating among members and for the accumulating and archiving the history of their group interactions*’ [4]. This points to some form of repository of information – be it forums, blogs or documents – that captures community participation and which can be explored and analysed for the purposes of learning. This requirement for a mix of communication tools and libraries of information is reinforced by Sobrero who lists the most common components of software used by virtual communities [16]. This list includes an online library of resources and work documents, email, chat, collaborative writing and asynchronous meeting spaces. However, a set of tools or software components on their own do not potentiate a group of individuals into a true community of practice. Instead it is the way the system integrates and handles the flow of information between the components that allows the community to flourish and creates a strong

supporting environment. The flow of information from tasks, discussions, practice, documentation and other community members provides a reference framework for the members in which they can ground their own practice and evaluate new experiences [17]. Such a facilitation and capture of information flow is fundamental to a connectivist approach to learning [17] and is seen as an underlying principle of the new environment.

There are, perhaps, more fundamental issues to be addressed by the technologies. For example, Sobrero points to the basic requirement of reliability [16], whilst Coughlin and Kajder highlight the fact that the most populous self-generated communities of tutors are those that utilise ‘frictionless’ technologies [9]. This ‘ease of use’ also appears in a review of technologies used by online communities by Zhao and Rap [18]. The review identifies four key requirements of a tutor technology:

1. Low threshold for teacher use of the technology
2. Scaffolds supporting authentic participation and engagement
3. Intersection between teacher learning needs and his/her available time
4. Less of a focus on a tangible product as an outcome and more focus on supporting teacher dialogue [18]

The first of these requirements reflects the need for an intuitive system that’s easy to use, whilst the second underlines the need for communication tools and information capture. The third point requires the technology to be always accessible and reliable and the last point reinforces the move from a task or product based system to one that facilitates discourse and the flow of information. There are, therefore, a number of considerations in the choice of technology for an

online community of tutors. Clearly, there are a multitude of Web 2.0 systems available that may meet these requirements and many have already been utilised by self-generated communities to great success [9]. As Coughlin and Kajder conclude, ‘*there is compelling evidence that these technologies are related to an acceleration in the distribution and adoption of many positive, research-based practices*’ [9]. They go on to predict more powerful environments created specifically for professional development. The challenge is to engineer such a system by leveraging collaborative technologies that fulfil these basic criteria, yet also provide tutors with a structured support mechanism from the host organisation that supports and facilitates professional development.

B. Solution Design

The intended solution under development has been code-named *Emirand*, and it will bring together new, re-modelled and existing applications. In doing so, the system will provide a single-sign-on environment that allows tutors to access all the relevant information and applications they require in one place. More importantly, these component applications will be integrated, allowing tutors to move intelligently from one piece of information or task to another, creating the reference framework that will facilitate connectivism [17]. For example, tutors may view their teaching timetable and select a lecture they are delivering. They may then choose to view the Intended Learning Outcomes for this activity from the Curriculum knowledgebase, or add this activity to their teaching loads record, or find associated learning resources. In addition, tutors will have the capacity to reflect on their teaching, discuss educational practice with other members and record and retrieve these practices in the member-populated

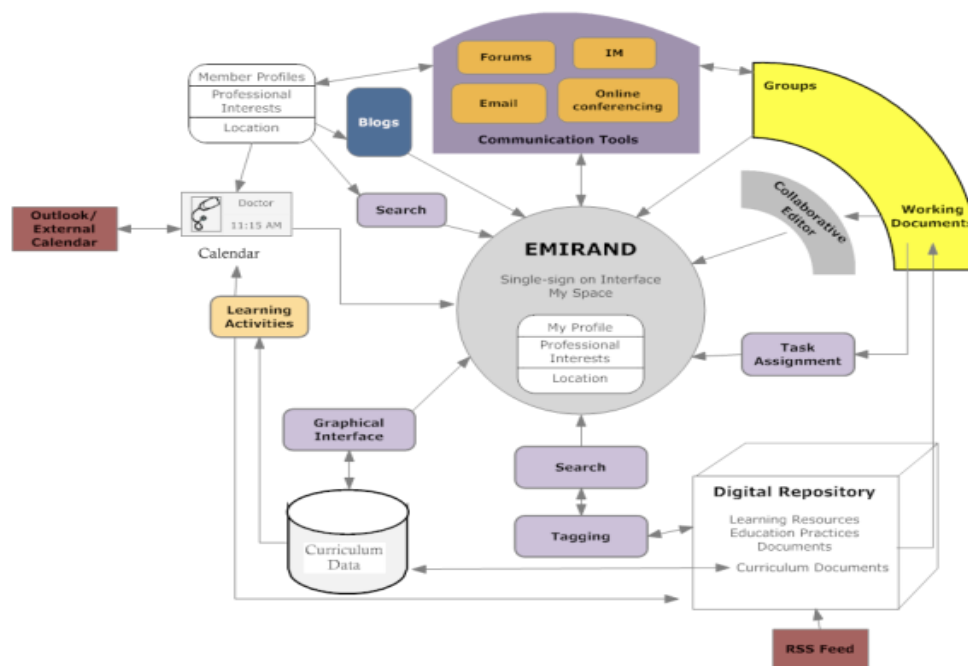


Figure 3. Emirand functional architecture

repository. The different elements of *Emirand* are depicted in Figure 3. below.

Emirand is currently being constructed in Liferay (www.liferay.com). Liferay is a Java-based, open-source portal server platform. This enterprise system enables organisations to pull together applications and content from a variety of Web-based and internal sources and present them as a unified, customisable portal. Liferay comes with a variety of ‘built-in’ applications or ‘portlets’, but its Service Oriented Architecture framework also allows the integration of existing services or applications. This makes it ideal for creating an enterprise architecture that is both fully integrated and extendable. The key components of the *Emirand* system are:

Communication tools – a range of synchronous and asynchronous communication tools such as Instant Messaging, forums, online conferences provides the mechanisms for tutors to easily communicate, discuss and exchange information and ideas on practice. These were chosen based on user requirements elicitation and usage figures from *ellaborate*.

Digital repository – Using the Liferay Library that is included in the platform system, allows all content to be stored, tagged and versioned for easy location and retrieval. By combining this with a domain specific taxonomy and community folksonomy, tutors are able to share and find resources, practices, people and conversations that will support their own practice. It will also provide a repository for organisational support documents that can be made available to the tutor during relevant activities.

Curriculum knowledgebase – a model driven database containing all the components of the medical curriculum. This allows tutors to access and explore the various elements of the curriculum they are delivering, carry out curriculum mapping and support curriculum development.

Social network – permits the user to search, find and contact other tutors in the community. This forms the key component of the community cohesion and allows the community to form around key members whose profile is reflective of their expertise in medical education. It also permits the adoption of formal and informal roles by community members, with group leaders emerging based on their expertise and experience [4].

Group structure – this allows groups of tutors to form around specific tasks, ideas or practices. This promotes the development of new practices, tools or resources for teaching. Groups can be formed, managed and populated by community members as well as the Medical School. This means groups can come together for any community driven agenda alongside those required by the Medical School.

These elements have been chosen to support the facilitation of the practice-based learning community we aim to create and they reflect the characteristics of such a community. This can be demonstrated by mapping the key features of the proposed system to the key characteristics of a practice-based community as defined by Reil and Polin [4]. (See Table 1)

Emirand also builds on similar work to create a ‘virtual sectorial university’ that adopts the tenets of the Whole Development Model [19] in which learning is seen as a continuous process which derives from experience and relies on the flow of knowledge within a learning community. This

virtual university was designed to support the continuing professional development of employees in the digital media sector through facilitation of knowledge flow and recording of experience, together with enabling the members to ‘mine’ each other for expertise and provide ‘on-demand’ information to support performance. These same principles can apply to the community of tutors and the creation of a practice-based community. By developing an environment that facilitates and captures the flow of knowledge, we aim to realise this latent demand for mutual support and sharing and by so doing improve the quality and efficacy of curriculum delivery.

Table 1. Emirand functions mapped to the characteristics of a practice-based community they support

Community Characteristic	Facilitating function
Leadership emerges from acknowledged experience and expertise	Social networking and group features that allows members to showcase their expertise and assume and perform roles.
Learning as the consequence of ongoing practice; continual redesign and experimentation	Repository and group features that allow current practices to be recorded, discussed and evaluated with peers
Open access to practice, practitioners and tools of practice	Social network and repository tools that provide open access to practices and resources alongside the members who created them.
Evolution of the practices through discourse	Repository and communication tools that allow for storage, tagging and discussion of sets of practice.
Shared values and language	Communication tools and an evolving folksonomy that provides the basis for a common language and articulation of community values

III. Conclusion

The potential of Web 2.0 technologies to provide a vehicle for community formation and performance is well documented and acknowledged. The advantages for tutors of belonging to such a community is also acknowledged, with improvement in practice and teaching efficacy seen as the most obvious benefits. However, most communities of tutors ‘piggy-back’ their groups on systems designed for other purposes, such as teaching delivery, resource sharing or pure social networking. Although these often serve the immediate needs of the tutors and generate a thriving community, they nearly all fail to provide tutors with the organisational support, information and professional development tools that

could offer a more complete solution. The challenge for a next generation of tutor support tools is to combine the informality and frictionless nature of social network systems with the structured frameworks and libraries of more formal Learning Environments. Equally, the community has to be allowed to evolve and flourish in a manner not necessarily determined by the host organisation, whilst also serving as a vehicle for achieving the organisation's aims.

Emirand constitutes a deliberate move away from the task based and more prescriptive nature of *ellaborate*. Instead it provides a complete framework of tools that reflect the needs of a practice-based community in the hope that such a community of tutors will be attracted and encouraged to use it. The tool also takes on the role of formal tutor support, currently delivered through other systems, in the belief that these have their greatest impact in the context of the community where members can discuss, evaluate and make sense of information by drawing on community wisdom.

TEWPL recognise that the creation of a system is, in itself, not sufficient to create the community and lessons learnt in the HeLMET project demonstrate the need for additional activities in order to embed the technology and generate a sustainable community [10]. Hence, the TEWPL team are working closely with the Medical School management and the tutors to both build the system and plan the implementation, roll-out and uptake by the users. The development of a domain specific community of tutors in a dedicated online environment that encompasses a holistic support mechanism is, we believe, an innovative and important step in addressing the issue of tutor engagement and support. We hope the lessons learned from our work will generate further work and ideas in this area.

References

- [1] Blass, E. and Davis A (2003). Building on Solid Foundations: establishing criteria for e-learning development. *Journal of Further and Higher Education*. Vol. 27, Issue 3, pp 227 – 245.
- [2] Muilenburg, L. & Berge, Z. (2005). Student Barriers to Online Learning: A factor analytical study. *Distance Education*. Vol. 26, No. 1, May 2005, pp. 29-48
- [3] McInnerney, J. M., & Roberts, T. S. (2004). Online Learning: Social Interaction and the Creation of a Sense of Community. *Educational Technology & Society*, 7 (3), 73-81.
- [4] Reil, M. and Polin, L. (2004). Online Learning Communities: Common Ground and Critical Differences in Designing Technical Environments. In: Barab, S., et al (eds) *Designing for Virtual Communities in the Service of Learning*. Cambridge, Cambridge University Press.
- [5] Salmon, G. (2003). *E-moderating: the key to teaching and learning online*. 2nd Ed. London. Taylor and Francis Books Ltd.
- [6] McPherson, M. & Baptista Nunes, M (2004). The Role of Tutors as an integral Part of Online Learning Support. *European Journal of Open, Distance and E-Learning (EUODL)*
- [7] Hauck, M. & Stickler, U. (2006). What does it take to teach online? *CALICO Journal*, Vol. 23, No. 3, pp469-475.
- [8] Cleary K. (2007). Finding and mending potholes in the laneways connecting higher education institutions with their part-time e-tutors: Virtual learning communities fostering organisational learning. *37th Annual SCUTREA Conference (SCUTREA 2007): 'Researching Adult Learning Communities and Partnerships in the Local and Global Context'*, 3 - 5 Jul 2007, Belfast, Ireland.
- [9] Coughlin E. and Kajder S. (2009). *The Impact of Online Collaborative Learning on Educators and Classroom Practices*. The Metiri Group. San Francisco. Cisco Systems. http://www.cisco.com/web/about/citizenship/socio-economic/docs/metiri_teacher_collaboration_research.pdf [Accessed 5 March 2010]
- [10] Cappelli, T., Dexter, H., Smithies, A. Banks, C. and Ukor, R. (2009). HeLMET Final Report. [Online] JISC. Available at : <http://www.jisc.ac.uk/media/documents/programmes/usersandinovation/helmetfinalreport.pdf> [Accessed 3 March 2010].
- [11] Wenger E, White N. and Smith J (2009). *Digital Habits: stewarding technology for communities*. Portland. CP Square.
- [12] Wilcox, D. (2009). *Clay Shirky: nonprofits must become new-style convenors – or lose their members*. <http://socialreporter.com/?p=516> [Accessed on 2 March 2010]
- [13] Shirky C. (2008). *Here comes everybody*. London. Penguin Books Ltd
- [14] Wenger, E., McDermott, R. and Snyder, W. (2002). *Cultivating communities of practice: a guide to managing knowledge*. Cambridge, Mass.: Harvard Business School Press.
- [15] Cappelli, T. and Smithies, A. (2009). Online Communities of Practice as Agents of Change in Curriculum Development. 4th *International Conference on e-Learning (ICEL) 2009 conference proceedings*. University of Toronto, Canada 16-17 July 2009. Reading: Academic Publishing pp. 68-75
- [16] Sobrero P. (2008). Essential Components for Successful Virtual Learning Communities. *Journal of Extension*. Vol. 46, No. 4, August 2008.
- [17] Pettenati, M., Cigognini, E., Mangione, J. & Guerin, E. (2007) Using Social Software for Personal Knowledge Management in Formal Online Learning. *Turkish Online Journal of Distance Education (TOJDE)*, Vol. 8 No. 3, July 2007, pp52-65
- [18] Zhao Y. and Rop S. (2001). A Critical Review of the Literature on Electronic Networks as Reflective Discourse Communities for Inservice Teachers. *Education and Information Technologies*, Vol 6, No. 2, pp81-94
- [19] Cappelli, T. and Russell, D. (2007). Digital Media U, the Sectorial University; Applying the Concept of a Corporate University to a Business Sector. In: McCuddy, M., et al (eds) *The Challenges of Educating People to Lead in a Challenging World*. Netherlands. Springer Netherlands.

Author Biography



Tim Cappelli. B.Sc in Environmental Biology, University College of Wales, 1985. Post Graduate Certificate in Education, Southampton, 1986. MA in Human Resource Management, Bolton, 2001. An experienced Project Manager who has successfully managed and contributed to a range of Technology Enhanced Learning and change management projects. His interests in organisational learning alongside successful change management were developed within the e-change project that enabled the successful implementation and evaluation of new practices within e-learning. This project involved the development of a competency-based learning needs analysis tool that diagnosed and managed learner competencies. In addition Tim has developed a rich understanding of the application of informal and collaborative learning through the use of social networking tools that reinforce the links between individual and organisational development.