A Framework for e-Learning: A Blended Solution?

D. Graham*[,1], **A. Valsamidis**[1]

[1] eCentre, University of Greenwich, School of Computing and Mathematical Sciences, 30 Park Row, London. SE10 9LS. UK

This paper describes a Framework for e-Learning and presents the findings of a study investigating whether the use of Blended Learning can fulfill or at least accommodate some of the human requirements presently neglected by current e-Learning systems. This study evaluates the in-house system: Teachmat, and discusses how the use of Blended Learning has become increasingly prevalent as a result of its enhancement and expansion, its relationship to the human and pedagogical issues, and both the positive and negative implications of this reality.

Keywords Blended Learning; e-Learning; e-Tutoring; e-Moderating

1. Introduction

In March 2005, it was reported that the main reason for the failure of the UKeU was attributable to the lack of research into potential customers' needs and a "supply-driven approach" [1]. This is one of many recent examples of problems with the development and employment of e-Learning. Mason [8] states that: *"There is absolutely no evidence that learners are able or willing to do without teachers, no matter how well designed the materials, how extensive the resources or how 'just in time' the learning. The fundamental role of the teacher or tutor has not changed but the mode of operation has"*. This view is further supported by experiential data from our current students on Information Systems, Multimedia, and Computer Science programmes within our own university [6] insisting on no more than thirty percent of their courses in total (their management, content and delivery, etc) be "e".

A study in 2005 [5] looked at the skills and knowledge required for both traditional and e-Tutoring in an attempt to discover the reasons behind the apparent lack of success of current e-Learning systems. To establish whether this lack of success was: an issue of requirements gathering and analysis; a tutoring problem; or simply a communications problem and an issue of Human-Computer Interaction (HCI). These endeavours led to the development of a Framework for e-Learning [5].

The next section describes the Framework for e-Learning and its relationship to Salmon's 5 Stage Model of e-Tutoring. In section 3, an in-house system is evaluated as to its fulfillment of the framework and its conformity with Blended Learning. In the final section, conclusions are drawn as to the efficacy of Blended Learning.

2. A Framework for e-Learning

2.1 Tutoring: Activities and Requirements

In order to identify typical tutoring activities, a representative week in the calendar of several university lecturers was elicited, resulting in a synthesis of common interaction examples that constitute teaching and tutoring. Highly noticeable was the significant amount of time spent dealing with e-mail. In Figure 1, the activities and tutoring skills required were identified from the diary synthesis. A third column was added which suggested the new skills required if for e-Tutoring. The inference is that e-Tutoring requires all the same skills as traditional face to face (f2f) tutoring, plus some additional skills. These additional

```
|Tutoring Activities        |Tutoring Skills            |New (e)Tutor Skills       |
|                           |                           |required                  |
```

Tutorials.	Personal and academic.	Technology.
Lecturing.	Communication, enthusing.	Coping with the lack of f2f contact, visual and audible cues.
Assessment.	Feedback, plagiarism.	
Research supervision.	Knowledge, support, enabling.	Dealing regularly with asynchronous and remote communication.
Preparing teaching materials.	Presentation, authoring.	
Mentoring.	Mentoring.	Remote, asynchronous enthusing! e-Motivation.
Queries.	Communication via e-mail and telephone.	Committed time management.
Scheduling.	Time management, organisational skills.	Extending the application of traditional tutoring skills, such as authoring and the scheduling of activities.
Updating skills.	Learnability.	
Industrial training visits.	People skills, assessment skills.	Adding to repertoire of teaching methods through the media. Information Visualisation!
External exam moderation.	Subject knowledge, assessment regulations, etc.	
Administration and meetings.		Adopting a more student centred approach?
Taught project supervision (UG and PG).	Academic judgement.	
EU project management.	Knowledge, support.	e-Socialising.
	More of all the above!	Culture/attitude shift.

Fig. 1 Activities and skills required for Tutoring and e-Tutoring

skills were considered to be firstly technological and secondly, skills which dealt with managing mostly remote and often asynchronous communication. Such skills relate directly to perceived problems with computer-mediated communication (CMC), and are equally inherent in Computer-Supported Cooperative Work (CSCW) and HCI. Computer-Supported Cooperative Work (CSCW) is about groups of users and designing systems to support their group work, understanding the effect of technology (products often called groupware) on group work patterns [3] [9]. Groupware can be classified as synchronous or asynchronous, co-located or remote, supporting computer-mediated communication, and shared applications and artefacts, facilitating meeting and decision support systems. Interaction problems such as the lack of visual and audible cues, gestures, intonation, turn-taking, context, collaboration, group dynamics etc have long been recognized by HCI and CSCW practitioners [7]. A further related area is Information Visualisation. Information Visualisation [13] can be defined as "the use of interactive visual representations of *abstract* data to amplify cognition". Learning is arguably a social activity, and communication is widely accepted as being central to any successful teaching and learning strategy [14]. A system will fail even if it fulfils all its functional requirements, if it does not address the requirements of the user.

2.2 Salmon's 5 stages of e-Tutoring

Salmon's [12] five stage model of e-Tutoring, the mapping of the relationship between the skills identified and those given or suggested by the model was next explored. Salmon's model for e-Moderating gives more weight to the social aspects of e-Tutoring; adapting to the e-Learning environment and the group dynamics (three of the five stages). The last two stages are those concerned with the actual knowledge construction and development. From direct experience, this emphasis is probably correct and this is the main implication for practice. In the Framework proposed (Figure 2), the human factors associated with stage 1 of Salmon's model appeared to be paramount to the success or failure of a system. Referring here to human factors such as; the current learning situation, communication, cultural and social

aspects, all of which are well known to other aforementioned disciplines and have much in common with the user requirements. Learning is achieved by providing appropriate scaffolding, whether for traditional tutoring or e-Tutoring. Instead of motivation there is e-Motivation, socialising becomes e-Socialising. Fundamentally, the nature of human interaction and the lack of visual and social cues etc provided by the technology is likely to be a major reason for Salmon's e-Tutoring stages 1 to 3 being more difficult in non f2f situations.

SALMON STAGES	SKILLS TO BE ACQUIRED	KNOWLEDGE TO BE ACQUIRED	ACTION TO BE TAKEN
STAGE 1: Access & Motivation	There is now an abundance of tools available, which may be W3C compliant (and SENDA compliant to some degree). These tools have much of what is required for all of the five stages, so what must be acquired are the skills and knowledge necessary for their use. It is the non technical aspects which are therefore the focus.	Vis. skills to be acquired. Tools are easier to adopt (and have often been adopted) for stages four and five, with forums etc available, to cater for stages two and three in particular.	Computer Science, Multimedia, and Information Systems students should be capable of attaining access! Motivation is the main problem which could be assisted by improvements to the course site Welcome? F2f meetings to be arranged prior to e-Tutoring?
STAGE 2: Online socialisation			Use of tool's news and course forums to be adopted for conferencing etc. Regular checking of forums is very important.
STAGE 3: Information exchange			Ditto stage 2 above.
STAGE 4: Knowledge construction			Stage 4 is often fully implemented and operational. Further improvements to the presentation and compliance could be made.
STAGE 5: Development			Achieved in most cases, but could be further improved upon, e.g. the links to past papers and other resources.

Fig. 2 A Framework for supporting e-Tutoring. Maintenance is deemed to be an issue for all stages of the model. STAGE refers to Salmon's [12] 5 stage Model of e-Tutoring.

3. Blended Learning and Teachmat

One possible solution proposed to the resolve of the inadequacies of e-Learning identified, the human requirements; such as Motivation and the lack of Online Socialisation described by Salmon's early stages [13], is the application of Blended Learning. There is currently a movement towards Blended Learning, with in-house course management tools invoking a creeping change in teaching practice from traditional tutoring to e-Tutoring. Blended Learning has been defined as [15]: *"An educational formation that integrates elearning techniques including online delivery of materials*

through web pages, discussion boards and/or email with traditional teaching methods including lectures, in-person discussions, seminars, or tutorials". In developing a Framework for e-Learning it was apparent that many of the technological requirements necessary to enable e-Learning were provided by an in-house tool, namely; Teachmat [4]. On reflection, it led also to the realization that many aspects of this Framework in relation to Salmon's 5 Stages had been attained for many courses, effectively these courses were using technology led Blended Learning. Teachmat was originally developed primarily for course content management support. It has been extended considerably, and indeed since the framework was suggested (for example, printed handouts are no longer given, and links to past papers and other resources now exist), from a mere repository for course materials to a comprehensive on-line intranet system. It now handles everything from; learning material, assignment uploads, assessment and examinations management, forums, student advice, registration and attendance, curriculum and institutional policies management, lecturer and student handbooks, etc, etc. The result is that the Teachmat environment has changed the learning and teaching style from traditional to Blended. The level of Blended Learning being individual to courses, with some courses employing multimedia course delivery, such as video. The facilities employed for courses are presently a matter of choice, however, virtually all coursework is uploaded on-line and there is a growing pressure for on-line assessment. Submissions generate automatic electronic receipts, and staff e-mail notifications in the case of final year projects for instance. Electronic registers record both weekly attendance and uploads for each week linked to the files themselves. Forums are available to students and staff at course level. The level of electronic communication with students and other staff has exploded as a by-product. Fundamentally, more and more elements of the teaching and learning are now electronic. Face to face (co-located and synchronous) teaching is still the predominant method employed in the institution for local (co-located) students, but much of the related activities are now remote and asynchronous. Lecturers still give lectures, tutorials and workshops in person but via personal computers, stored on data sticks or directly linked to Teachmat. Teachmat is being further exploited for external institutions, where both teaching and supporting activities are being carried out remotely and asynchronously, using video for example. Here learning is moving from Blended to fully "e".

The pros of this situation, the deployment of Blended Learning, appear to be mostly managerial: For example, a reduction in the amount of printing and photocopying costs, and paper; Moderated work is immediately available electronically, indeed almost everything is now available at the click of a mouse. All learning material for each course (schedules, coursework, room bookings, etc) are on the system so staff absence can be more easily accommodated. Staff absence is also recorded on the system and news bulletins provided on Teachmat inform students of the absence of staff; Extenuating circumstances and coursework extensions are also dealt with on-line; Everything is on Teachmat.

Teachmat, whilst having provided for many of the mostly technical requirements of Blended Learning or the Framework for e-Learning support, has yet to completely resolve the human issues: Tutors are expected to be on-line 24/7; Traditional tutoring is still superior in terms of flexibility and the accommodation of unforeseen circumstances; It is still much easier to flick through paper coursework submissions than electronic ones; A register only actually shows that a file has been uploaded for a course that week by the student; There are restrictions on the file size of uploads; Any printing of uploaded coursework is restricted to black and white, which is a weakness for assessing HCI criteria in particular, adding further pressure for tutors to mark on-line; Students and especially staff feel that are being dictated to by the system; There are issues associated with the ownership of teaching materials which are obviously more accessible in electronic form; Teachmat has furthered the vast increase in "e" administration, continuously monitoring forums, plus the propagation of electronic communication and documents being required to be completed for tasks; The management system is becoming unmanageable; Anxiety and resentment within staff and students is being created by this "wandering into" Blended Learning; There are still health and safety, pedagogical, as well as social issues regarding e-Tutoring which have yet to be addressed; Finally, everything is on Teachmat.

4. Discussion and Conclusions

In developing the Framework it had been suggested that the problems of e-Learning were not new and were as for other forms of interaction and their requirements. It was further suggested that e-Learning should heed the lessons learnt from other areas such as HCI and CSCW and that the problems of e-Learning and associated requirements were no longer fundamentally technological but human. It was concluded that it was these problems that needed to be addressed in any proposed framework, if progress was to be made. This might be enabled by greater improvements in communications technology becoming sufficiently sophisticated as to convey subtle cues etc, but subsequent progress may ultimately necessitate a cultural and social shift in the attitudes of tutors and tutees towards teaching and learning per se. It was yet to be seen whether or not the Department for Education and Skills' latest e-Strategy "Harnessing Technology: Transforming learning and children's services" [2] would prove successful in addressing the issues raised.

It is now concluded that the use of Blended Learning has been an indirect consequence of the in-house technologies now employed. Tools like Teachmat are directing teaching and learning practices towards Blended Learning. The development of such in-house tools has caused a technology led proliferation in the employment of Blended Learning. This sea change was not a conscious decision by staff and students, who are highly unlikely to request e-Learning. This raises questions about the pedagogy behind systems developed. HCI and communications issues remain, as do some technical problems. The major concern is that although many (but not all) of the technical requirements have been catered for by tools like Teachmat (as demonstrated by the list of pros, in the main associated with Salmon's Stages 3-5), many important issues, namely those referred to as "human" have not been addressed (reflected by the list of cons, mostly associated with Salmon's Stages 1 and 2). There has not necessarily been any cultural or social shift in attitudes however.

Finally, it is concluded that successful embodiment of human factors; pedagogical, social, etc, is still key and requires most effort for fully "e" or Blended Learning. Blended Learning is presently not providing a solution, it has yet to accommodate the attainment of Salmon's motivational or social stages identified by the Framework, the constant focus on the technology is merely aggravating the situation.

Acknowledgements The support of the other participants of the CeLTT workshops, their contributions to the synthesis and to Figure 1 is gratefully acknowledged.

References

[1] Computing, *VNU Business Publications, 3 March 2005*, (2005)

[2] Dfse, Harnessing Technology: Transforming Learning and Children's Services. Dfse Website. http://www.dfes.gov.uk/publications/e-strategy/

[3] Dix A., Finlay J., Abowd G. and Beale R., *Human-Computer Interaction*, Third Edition. Prentice Hall, pp. 476-508; 664-713 (2003)

[4] Graham D., Developing a Framework for e-Learning 2006. Keynote Paper. *Proceedings of the Developing a Framework for e-Learning Workshop 2006, part of the 7th Annual Conference of the Subject Centre for Info mation and Computer Sciences, Higher Education Academy*, Trinity College, Dublin, 29th August 2006, pp. 4-9.

[5] Graham D., Developing a Framework for e-Learning, *Proceedings of the 6th Annual Conference of the Higher Education Academy*, University of York, 30th August – 1st September 2005, pp. 111-114.

[6] Jones R., *pers. comm.* (2004)

[7] Maier P. and Warren A., *Integr@ting Technology*. Kogan Page, pp. 103-106 (2000)

[8] Mason (2004). In: [7]

[9] Preece J., Rogers Y. and Sharp H., *Interaction Design Beyond Human-Computer Interaction*. Wiley, pp. 105-137 (2002)

[10] Ryan M., *CeLTT teaching materials*. School of Education and Training, University of Greenwich (2005)

[11] Ryan M., *pers. comm.* (2005)

[12] Salmon G., *All things in Moderation*. Prentice Hall (2004)

[13] Shneiderman B. and Plaisant C., *Designing for the User Interface*, Forth Edition. Addison Wesley, pp. 580-601 (2005)

[14] Sutherland P., 'Vygotsky and Vygotskyans' in *Cognitive development today: Piaget and his critics*. London: Paul Chapman, pp. 45-46 (1992)

[15] www.teach-nology.com/glossary/terms/b/

* Dr. Deryn Graham: e-mail: D.Graham@gre.ac.uk, Phone: +44 (0)20 8331 8654

© FORMATEX 2006

© FORMATEX 2006