

# The Use of Wikis and Online Classrooms to Promote Deeper Learning

Caroline Coles

Leicester Institute of Legal Practice, De Montfort University Leicester, England

**Abstract**—Interest is increasing in the use of collaborative online learning tools to improve intrinsic motivation and engagement in learning. With reference to pedagogic theory, this paper reports on a pilot with post graduate work based learners using these tools to extend the practical benefits of e-learning into the higher cognitive levels of deep learning and suggests some elements for future material design.

**Index Terms**—collaboration, deep-learning, motivation

## I. INTRODUCTION

The aspiration towards deep learning is clearly recognised amongst educators. This form of learning reaches towards the higher cognitive levels [1] to develop a critical awareness in an evaluative mind that is able to transfer understanding from one situation to another, and to find novel, creative solutions that are highly sought after by the academy and the work force. However, there are many features of modern learning that threaten the ability of our learners to develop this understanding, for example the pressures of time, increasing specialisation within work and the vast explosion of digital information. Thus investigation is needed into the conditions to support deep learning and how far modern technology can contribute to them.

This article reviews the pedagogic theories around the conditions for a deep approach to learning and reports on empirical research with adult work based students on the benefits and risks of two key tools of learning technology - the wiki<sup>1</sup> and the online synchronous classroom<sup>2</sup>.

## II. CONDITIONS FOR DEEP LEARNING

Key writers have analysed the vital role of deep learning in education and training [18,21,29] that impacts upon the growing concern about the lack of discernment in education. It is said that a deep approach to learning may be characterised by an engagement with the learning process that challenges existing ideas and produces an ability to see the conceptual meaning of information. It may develop conceptual understanding beyond the mere passing of an assessment point. This is not to denigrate the need for certification in the right place but it has been suggested that excessive assessment may act against deep learning [18,22,28]. These prior studies compared the outcomes of learners who had been set a reading task with the expectation of being questioned on it. The group,

who had been told in advance that they would be assessed, tended to recall facts but showed minimal awareness of the concepts within the material (what has become known as surface approach to learning) whereas the group, who had not expected to be assessed, were better able to explain and recall the concepts behind the passage and showed a deeper level of evaluation and analysis (deep approach).

Behaviourist studies investigating conditioning [7] examined the link between motivation and learning approach. Intrinsic motivation, defined as an “interest in what is being learned and the feelings of pleasure derived from it” [6], was described as crucial to deep learning. Such motivation may be encouraged by a supportive learning environment that grants a significant amount of control and emotional support to the learner. These environments should permit learners to collaborate and thereby develop learning on a social constructivist basis [30], creating communities of practice [11]. The element of pleasure in learning recalls the work of theorists on the affective domain [2,10] and informal learning [4,38]. Such theories are supported in recent learner experience research [9] that place great value on the elements of peer to peer working and enjoyment in learning. Thus, this study wanted to investigate the potential for collaborative e-learning to contribute to this.

Studies in clinical psychology [5] also appear to offer support for the role of collaboration in learning due to relative roles of the short and long term memory. These suggest that all stimuli is initially received into the short term memory, most of which is not retained in order to permit the body to carry out its multiple day to day functions. A deeper and more memorable understanding of complex ideas requires a transfer from here into the long term memory. This transfer route becomes vitally important for a deep approach to learning. Pedagogic literature argues that peer to peer collaboration is supportive in this transfer not only because it creates direct benefits from the exchange of ideas but also because of the indirect benefits of improved communication skills and friendship that echoes back into the creation of intrinsic motivation.

Yet the value of collaborative learning is not without pedagogic opposition. With an increased concern about digital literacy, concerns are raised about the legitimacy of the “wisdom of the masses” and of the objective for learning as certification rather than for communal understanding. There is also concern about anti-social

<sup>1</sup> A collaborative web site e.g.wikipedia

<sup>2</sup> Sometimes called a webinar

elements within learning communities and an inequality of participation or the lack of commonality in a global community where learner expectations and sense of learning obligations are very different. There is also the issue of personal choice of learning style. Such differences were investigated in work on multiple intelligences [7] that described how learners who perform highly in one area, such as factual memory, may perform poorly in others, such as empathising with other people. Such intrapersonal intelligence could hinder an ability for informal or collaborative learning. This is quite apart from the mere practical problem for the work based learner disconnected from an educational campus.

Recognising these concerns, this study sought to examine whether e-learning can help achieve the benefits of collaboration and situated learning and minimise the criticisms. Can modern technological processes facilitate deep learning and move beyond training for certification? How far can technology enhanced learning act as fuel or extinguisher to the processes and conditions for a deep approach to learning via encouraging enjoyment in learning and, by bringing learners together, allow time for reflection within the fast pace of the work place?

### III. LEARNER EXPERIENCE RESEARCH

A central theme for this research is facilitating learning that involves the deeper cognitive levels, both creative and analytical. Critics of e-learning describe an impersonal, passive environment that can only provide for the transfer of unchallenged knowledge and, indeed, practitioners will be aware of past examples of this style. Yet, the use of information technology is seen as a key skill in the work place for improving the skills base of our colleagues and has the capacity to provide many advantages in the efficient use of, and improved access to, resources of all kinds.

Thus the objective of this research was to examine whether, using appropriate e-learning collaborative tools, these deeper levels of learning can be achieved by work based law students. Prior learner experience research appeared to suggest some opportunities here as learners liked the features of e-learning for its speedy communication, flexibility and ease of access to materials [9,26]. On the use of the wiki specifically, described as the “architecture of participation” [20], it has been suggested [17] that it can increase collaboration, introduce more creativity and aid greater experiential learning. Other studies [27] agreed that it provided an enjoyable, dynamic online social environment in place of discussion boards, that, too often, were dry and uninspiring.

In this study, the wiki was situated within a closed virtual learning environment and contained tasks set every 4 weeks over one year. The learners in the study were work-based but had occasional face to face tutorials with the teachers. Some of these work environments were linked to law, but not all, as the post graduate course is

available to any university graduate who wishes to increase their understanding of law. This produces a very diverse learner community, including forensic computer engineers and musicians in which the lack of a shared common experience can create challenges. The initial tasks were kept relatively simple and merely invited comment on a pre-existing report. The learners were asked to comment on its persuasiveness and clarity and ways for improvement. After a few months, the tasks increased in complexity so that learners had to publish their own views online in the wiki, assimilate those of their colleagues, and construct a piece of legal advice for a simulated client. These later tasks were designed to be useful to the learner in a real life work situation as they asked for the consideration of alternative courses of action. The learners were required to analyse the facts of the client problem and apply the law to it. Entries to the wiki showed a variety of legal interpretations, mirroring real life, and included diverse solutions. Each of these options required evaluation thus the learners needed to work through these, as though with colleagues in real life, to evaluate the presented options and arrive at a consensus, if possible. As the study wanted to review the development of intrinsic motivation, contribution to the wiki was voluntary, although encouraged by the tutors.

Surveys gathered the views of the learners via a written questionnaire and of the teachers via an interview.

The results found that over half of the learners thought that the wiki was helpful to their learning. The most common reasons given for this: it provided the opportunity for more discussion with other learners that they valued highly; it provided something different; it offered flexibility of time and place for their learning. Some felt that the use of a wiki would make them more confident to express their own opinions in a face to face setting. Some expressed a sense of satisfaction with handling technology and its contribution to their ability to manage higher education within their lives.

“I found it very useful and a good additional learning tool – could be filled in at your own pace” [15].

However, a few felt frustrated as they wanted more teacher input into the wiki showing a continuing reliance on the teacher as the source of their learning. These respondents expressed a belief that gave less value to peer discussion for their learning. There did not appear to be a strong correlation within the responses in favour of the wiki and familiarity with technology, as even those who said that they did not use technology substantially liked the idea of the wiki; it appeared that the need for flexibility in their learning overcame most anxiety. However, some anxiety is still present as some admitted to remaining shy about having their comments available for others to see and having a fear of looking foolish to their peers.

The results of the survey from the teachers concluded that 80% of learners had made a significant contribution to the tasks. The quality of responses in the wiki showed a much higher level of critical involvement with the task than was seen typically in face to face training session and there was also greater willingness to express a evaluative opinion. It would appear that the learners were becoming more critically aware as consumers of professional writing, compared to previous training experience. Contributions seemed to suggest a critical connection with the subject matter, for example,

“I would be in favour of this style of argument and liked the way that the first part of the document was clearly set out” [14].

It was thought that the wiki offered greater potential for experiential learning as the students had time to reflect upon the contributions of their colleagues and create a response. The diversity of opinions produced in this way appeared more realistic to work environment. The cohort appeared more prepared, over previous cohorts, to ask questions in the face to face sessions, suggesting that there was some skills development, although the effect of variable is appreciated. In conclusion, it was thought that the wiki produced an increased level of engagement and a deeper approach to learning was demonstrated. There appeared to be an increased level of enjoyment from the learning tasks for some and there was some comment that learners thought the wiki might be useful in future, if used in other ways, although no specifics were given. However, one of the aims had been to encourage a collaborative approach to the production of documents that could be used in a working law firm. Although learners were reading the work of their colleagues they still appeared reluctant to comment directly upon the contributions of others. Thus, the future plans for this tool is to review the level of teacher involvement and managing learner expectations of this and to experiment with other types of tasks, in particular the elements of informal learning.

#### IV. THE ONLINE CLASSROOM

A Cisco Webex Training Centre was used<sup>3</sup> with 5 classes of distance learning adult students who had not used the wiki. The choice of this software was effected by the requirements for audio conferencing, file sharing, online interactive tools such as breakout groups, a recording function, clear on screen presentation and ease of use. The groups ran with up to 8 learners per class using a complex problem solving scenario for a legal client. The learners identified the key elements of an area of law and discussed their preferences for a variety of solutions. The tasks involved a plenary discussion and break out sessions followed by a plenary report. The learners attended online in the early evening from their own homes or place of work.

<sup>3</sup> other available software include Adobe Connect, GoToMeetings, DimDim

Surveys gathered the views of the teachers via an interview and the learners via an online focus groups. From the learners, the response was generally favourable. Each learner felt able to contribute to the shared document space. They particularly liked the way that evidence of understanding could be increased as contributions were built upon. They liked the visual stimulus from the shared document that was made available to download after the session. Learners who were more comfortable with a didactic style of teaching appeared to see this as a step encouraging them towards greater collaboration and they felt more confident with this than the more informal collaborative sessions, such as discussion boards, that they had experienced. The learners enjoyed the sessions and felt that a learning community had been established. The occasional technical hitch was experienced with sound transmission but learners appeared willing to overcome these and accepted the alternative of in programme text chat if the audio link was lost.

The teachers' views were divided between two topics - design of the learning materials, adjusted for the session, and the flow of the session. The influence of the affective domain was significant for both. The requirements for design were often familiar to the teacher but needed adjustment and special emphasis for this environment. The design elements included a welcoming first screen view of the shared document to describe that the class is waiting for others to join and initial instructions about the interface. The questions for plenary discussion needed to be more focussed than a face to face session allowing more concise responses. The role of online facilitator was found to be very challenging and often involved juggling several sources of input, especially if a student loses sound contact; a pre- announced alternative plan helped a swift response to keep the session flowing. When a wider ranging discussion was required a break out session, using text chat within the group, proved more effective. Each break out group was then able to appoint a reporteur to feedback back to the plenary session. Several opportunities were needed for emotional feedback to the tutor via the ticks or emoticons to replace the lack of non verbal feedback. The addition of interactive quizzes and polls in programme provided vital feedback on cognitive issues. In summary, it was seen that there were many benefits for the engagement of the work based learner but the social issues must receive significant attention to promote the continuity of the session and the intrinsic motivation if the full benefits are to be gained.

The motivational issue around the addition of video or webcams remained an issue of debate. It is understood that this can contribute positively to the improvement of social presence and yet, as ever with e-learning, the issues are not so simple. The expectations from video performance are so high that anything less than a star performance may discourage the student, drawing attention away from the learning focus. In the initial sessions of this trial, participants were concerned about

the risk of multimodal overload as the student becomes so overwhelmed by the combination of learning tools that they withdraw from the learning issues. It is recommended that further pilots are run with this.

## V. CONCLUSIONS

Technology touches a large part of our lives. The “any time, any place” access that it brings is highly valued by the work based learner and provider alike, but its deployment in the learning process needs to become more effective in developing learners’ skills of evaluation and analysis for their development within the modern workplace in the knowledge society. It has been known for some time that these skills are under threat from many trends of modern life. The use of e-learning is now reviewed in a more critical light than the early years of the 21st century. Recent research [9,13] has taken a more realistic view of its impact and the need to avoid a “naive technological determinism” [22]. This study sought to examine the factors that may encourage a deep approach to learning and whether e-learning can support these. It sought to investigate the role of two collaborative tools in supporting the work based learner to attain the higher levels of learning or whether e-learning is to remain bound at the ground level of training. The literature suggested that learner engagement and intrinsic motivation are vital. Many previous studies placed emphasis on collaborative and informal learning; issues that have featured largely in the work of the key speakers to the ICELW conference. Yet it is recognized that the intended results of these activities are not always achieved. In seeking the wisdom of the masses are we seeing a decline in the role of the academic expert so valued by provider and learner alike?

This study suggested that progress towards deeper learning is possible within e-learning so that its use can provide educational benefits as well as the economic. The use of these collaborative tools appeared to stimulate a higher volume of engagement amongst work based students at a higher cognitive level than had been experienced in campus based tutorials. It appeared to be supportive of face to face learning, where this was also available, and to act as a method to build skills incrementally. The online class appeared to create a greater sense of a learning community amongst motivated learners than that produced by the wiki. Both tools accommodated the vital element of enjoyment and seemed able to transfer an element of control to the learner, and yet the online class also provided the work based learner with highly valued teacher feedback. For the teacher, the learning curve for its effective use was rather steeper, but this pilot produced some useful practical experience and the results were worthwhile.

External economic pressures are demanding a more flexible workforce with ever changing skills, including the improvement of those demonstrating a higher level of learning, it is believed that the right e-learning tools can

contribute to meeting these needs for the work based learner.

## REFERENCES

- [1] Bloom, B.S., Engelhart, M.D., Furst, E.J., Hill, W.H. & Krathwohl, D.R. (1956) *Taxonomy of educational objectives. The classification of educational goals, Handbook I: Cognitive domain*. New York: David McKay Company Inc.
- [2] Boyle, A. (2007) *The affective domain - report on a workshop at Carleton College*. Planet No 18 p49. Also [www] Available from <http://www.serc.carleton.edu> [Accessed 10.06.10].
- [3] Cross, J. & Hamilton I. (2002) The DNA of e-learning, excerpt from *Beyond e-learning* [www]. Available from <http://internettime/pbwiki.com>. [Accessed 02.04.11].
- [4] Dewey, J. (1916) *Democracy and education: an introduction to the philosophy of education* New York: Simon & Schuster.
- [5] Edelman, S. (2008) *Computing the mind: how the mind really works*, Oxford University Press.
- [6] Entwistle, N. (2009) *Teaching for understanding at university*. New York: Palgrave Macmillan.
- [7] Gardner, H (1983) *Frames of mind: the theory of multiple Intelligences* New York, Basic Books.
- [8] Illich, I. (1970) *Deschooling society*. New York: Harper and Row.
- [9] JISC (2008) *Exploring the tangible benefits of e-learning*. [www] Available from [www.jisc.ac.uk](http://www.jisc.ac.uk). [Accessed 10.4.11].
- [10] Krathwohl, D.R., Bloom, B.S., & Masia, B.B. (1964) *Taxonomy of educational objectives. the classification of educational goals, Handbook II: Affective Domain*. New York: David McKay Company Inc.
- [11] Lave, J. and Wenger, E. (1991) *Situated learning*. Cambridge: Cambridge University Press.
- [12] Lauder, H., Brown, P., Dillabough, J-A., Halsey, A.H. (2006) *Education, globalization and social change*. New York. Oxford University Press.
- [13] Laurillard, D. (2002) *Rethinking university teaching: a conversational framework for the effective use of ICT 2nd edn* London: Routledge.
- [14] Learner D View recorded in Coles, C. (2010) *Adopting the tools of technology enhanced learning for the improvement of research skills*. (Unpublished).
- [15] Learner E View recorded in Coles, C. (2010) *Adopting the tools of technology enhanced learning for the improvement of research skills*. (Unpublished).
- [16] McGregor, D. (1960) *The human side of enterprise*. New York: McGraw-Hill.
- [17] Maharg, P. (2007) *Transforming legal education: learning and teaching in the law in the 21<sup>st</sup> century*. London: Ashgate.
- [18] Marton, F and Saljo, R (1976) *On qualitative differences in learning – I Outcomes and process*. British Journal of Educational Psychology, 46, pp 4-11.
- [19] Mayer, R.E. (2001) *Multimedia learning*. New York: Cambridge University Press.
- [20] O’Reilly (2005) *What is Web 2.0* [www] Available from <http://www.oreilly.com>. Accessed 10.06.10.
- [21] Perry, W.G. (1970) *Forms of intellectual and ethical development in the college years*. New York: Holt, Rinehart and Winston.
- [22] Ramsden, P. (2003) *Learning to teach in higher education 2nd edn* London: Routledge.
- [23] Rocca, K.A. (2007) *Immediacy in the classroom* Presentation to the Students Motivations and Attitudes conference Northfield Minnesota, USA 12 February 2007. [www] Available from <http://serc.carleton.edu/files/NAGTWorkshops/affective/workshop07/rocca.pp>. [Accessed 01.05.10].
- [24] Rosenberg, M. (2006) *Beyond e-learning: approaches and technologies to enhance organisational knowledge and performance*. Pfeiffer.
- [25] Rossitt, A. (2002) *The ASTD e-learning handbook*, New York: McGrawHill.
- [26] Salmon, G. (2004) *E-moderating 2<sup>nd</sup> ed* Abingdon: Taylor & Francis.
- [27] Schactner, C. (2009) Learning wiki- digital ways of learning in the training of apprentices .In: *Proceedings of the International Conference for E-learning in the workplace, New York, June 2009* (unpublished).

- [28] Schmeck, R.R. (1983) Learning styles of college students in R. Dillon and R. Schmeck (eds.) *Individual differences in Cognition*. New York: Academic Press.
- [29] Weigel, V. (2002) *Deep learning for a digital age: Technology's untapped potential to enrich higher education*. New York: Jossey-Bass.
- [30] Vygotsky, L.S. (1986) *Thought and language*. Cambridge, MA: MIT Press.

AUTHOR

**Caroline Coles** is a principal lecturer with De Montfort University, Leicester, UK (email: [ccoles@dmu.ac.uk](mailto:ccoles@dmu.ac.uk)). Manuscript submitted 9 May 2011.