Conversations in the cloud: The use of blogs to support learning in higher education

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Abstract

Modern information and communications technologies provide a range of options for users to digitally capture and share their experiences and reflections. This paper will examine how blogs have been used effectively for the development of higher order cognitive thinking and knowledge. Using the socio cultural meditational theories of Lev Vygotsky, I will examine some of the empirical evidence regarding the use of blogs in three distinct university settings. Specifically this paper will attempt to address the following key questions:

- How have blogs been incorporated into learning activity settings?
- How can the use of blogs facilitate assisted performance by a more knowledgeable other?

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Introduction

Computers for use by students have become quite common in universities in the last 10 years. They have been introduced with the hope that they might radically transform the institution as well as the teaching and learning process (Davidson & Goldberg, 2009; JISC, 2009; Wiley, 2009). The introduction of computers into higher education makes the design of learning activities which integrate these new tools even more important. The role of the instructor is crucial in coordinating and navigating a student towards effective use of the computer for the desired learning outcome. Therefore the design of learning activities which make use of information and communications technology (ICT) must be carefully coordinated.

This paper will investigate how information and communication technologies have been used to mediate the learning of university students. The availability of new ICT tools presents academics with an opportunity to engage in new activities which may foster collaborative learning. This paper will specifically review the literature on the use of blogs at universities. Blogs provide a reflective space for students to record their thoughts, ask questions, engage in debate and participate in a community which extends well beyond the walls of the physical classroom. Blogs have not however become part of the regular arsenal of tools used by an instructor for teaching at universities.

Socio-cultural learning theory

This analysis is grounded in the socio-cultural theories of Lev Vygotsky. While Vygotsky conducted his work in the early part of the 20th century, his theories of mediation, the zone of proximal development, and physical and cultural tools are useful when considering how humans acquire higher order scientific concepts such as those taught in university courses.

Vygotsky’s (1978) general genetic law states that all functions of a child must occur first in the social world. That is, all activities and knowledge that a child is able to engage in would have been mediated to them by a more knowledgeable human being. This implies that the uniquely human meanings and understandings we hold for objects experienced in the world around us, are mediated to us in the social realm and have been culturally and historically developed (Vygotsky, 1978).

Vygotsky specifically referred to scientific concepts as those learned through formal schooling (Vygotsky, 1987). Scientific concepts are those that are transferrable in our everyday lives and form higher order thinking and logic that extend the meaning of our everyday empirical knowledge (Hedegaard, 1998).
Essentially, scientific concepts are those uniquely human ideas and structures for thinking which can be shared among human beings through language. As a result of sharing these scientific concepts through education, our culture has the ability to survive or succeed depending on the context.

Effective teaching requires that scientific concepts be linked back to a student’s everyday empirical knowledge in creative ways (Hedegaard, 1998). The idea being that the introduction of a scientific concept results in cognitive change which enables the student to better understand and make sense of the world around them. Therefore, in order for a scientific concept to be useful to a student it should have some relevance in their everyday life.

Humans interact with the world through “mediational means” such as tools and language which shape the course of our action (Wertsch, 1991:12). Vygotsky proposed that external tools are used to manage the process of remembering and the advances of mankind coincide with the development of new devices and forms of mastering mental operations (Vygotsky, 1987). Language and symbols are an essential part of how we act on the world as well as servicing to mediate our action (Wertsch, 1991). Our understanding of language and symbols in society is therefore vital to the way in which we interact with the world within our culture.

Tools may be physical or psychological in nature and are culturally, historically and socially situated (Vygotsky, 1978). Physical tools are objects which allow us to act on things or situations such as a hammer. Psychological tools embody both physical artefacts and symbolic systems. Both physical artefacts (art and maps) and symbolic systems (language and number systems) we come to understand through deliberate mediation by a more knowledgeable other (Kozulin, 2003). Psychological tools are meant to be used as generalized instruments “capable of organizing individual cognitive and learning functions in different contexts and in application to different tasks” (Kozulin, 2003:26). This contributes to Vygotsky’s definition of scientific concepts which help us to make better sense of our world.

**Assisted performance in the university classroom**

When learning something new the zone of proximal development (ZPD) refers to the conceptual distance between what higher cognitive functions a student can perform on their own and what can be done with the assistance of a more knowledgeable person (Vygotsky, 1978). The ZPD is a conceptual space within which a learner should progress while working in collaboration to a point where they may perform a higher cognitive function on their own. Mediation through instruction is the activity of
narrowing the ZPD through guided assistance as the more knowledgeable other instructs, guides or scaffolds the learner (Hedegaard, 1998).

Vygotsky (1978) uses the example of students who are new to school approaching structured arithmetic lessons for the first time. Although never formally engaged with the scientific structure of arithmetic, the child has most certainly experienced the concepts of quantity and addition in a primitive non-scientific way. By using teaching techniques which relate the student’s empirical knowledge with the scientific concepts of arithmetic, the teacher is able to instil new ways of thinking about quantity expanding on what the student currently knows (Vygotsky, 1978).

According to Vygotsky, “instruction is only useful when it moves ahead of development” (Vygotsky, 1978:212). Vygotsky believed that effective teaching through assisted performance could bring about changes in cognitive ability which are in a state of maturation (Vygotsky, 1978). This is achieved by using responsive teaching techniques which enables the instructor to interact closely with the student and ensure they reach a level of appropriate understanding. Once the student has internalized the cognitive abilities taught through the social, they may then become part of the student’s own developmental achievement (ibid).

University courses must be designed to teach what is appropriate and achievable for young adults, while wherever possible using their actual experiences to ground theoretical concepts (Hedegaard, 1998). Hedegaard (1998) defined the knowledge that should be taught to a student at a specific level to be normative, that is, defined by the generally accepted expectations of society for a particular level of student. The problem remains that the instructor must have some understanding of a learner’s upper level of the ZPD so that they may know how to begin mediating the required knowledge.

The means of assisted performance through instruction at universities

University classes are increasingly growing larger with added pressure on the teacher to complete the required curriculum. The university instructor must use the class time they have available to ensure they cover the required curriculum with the students. Traditionally, students are given a small window with which to express themselves through assignments and in class discussion. ICT may create opportunities for students to communicate and externalize what they understand for quicker formative review by the instructor and other students, thus allowing for self correction.
A theory of teaching as assisted performance has been offered by Gallimore and Tharp (1988, 2002) which offer a number of alternatives to traditional didactic methods of instruction. The following techniques for assisting performance (Table 1) put forth by Gallimore and Tharp were developed long before modern ICT became commonplace. These techniques are general methods for assisting student’s progression through the ZPD which were most likely developed with in class instruction in mind.

**Table 1 – A summary of Gallimore and Tharp’s theory of assisted performance**

<table>
<thead>
<tr>
<th>Meditational Technique</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modeling</td>
<td>A more knowledgeable others offers ideal or desired behaviour for imitation by the student</td>
</tr>
<tr>
<td>Contingency management</td>
<td>Rewarding desired behaviours through praise and encouragement. Controlling undesirable behaviours through punishment in the form of reprimand or correction.</td>
</tr>
<tr>
<td>Feedback</td>
<td>Giving feedback on performance to correct or improve performance thereby encouraging students to correct themselves and try again</td>
</tr>
<tr>
<td>Instructing</td>
<td>A more knowledgeable other gives explicit information on specific acts such as assignments, tasks or group processes</td>
</tr>
<tr>
<td>Questioning</td>
<td>Well designed questioning meant to incite creative and well structured responses from the student</td>
</tr>
<tr>
<td>Cognitive structuring</td>
<td>Providing a framework for thinking and acting either for structuring explanations of a student’s experience or perception (Type 1) or structures for cognitive activity and processes (Type 2)</td>
</tr>
</tbody>
</table>

Gallimore and Tharp (2002) argue for the creation of activity settings which support and allow ‘teacher to student’, ‘student to teacher’ as well as ‘student to student’ activity and dialogue. By activity settings we mean the moments where interaction, collaboration, assisted performance, and intersubjectivity or shared experiences occur within the structure of a formal teaching scenario (Gallimore & Tharp, 2002).

Activity settings are those actions and discussions which a teacher coordinates or facilitates in order to lead to a group of students learning. Gallimore and Tharp (2002) argue for joint productive activity in which all members of a learning activity engage in conversation, for it is through dialogue and interaction that learning can occur. By engaging in an “instructional conversation”, the teacher gives the learner an opportunity to express what they know and provide responsive adjustments in the form of assisted performance (ibid). The design and application of activity settings which employ the instructional conversation aim to narrow the power distance between student and teacher as the
student is given a voice and opportunity to express themselves freely. The student’s active voice is a requirement for the instructional conversation to exist.

This analysis will go on to examine how the techniques of assisted performance might be applied using computer mediated technologies which can facilitate reflection, questioning and discussion.

**Towards a theory of assisting performance using ICT**

New technologies afford the potential to extend the classroom and create a virtual space for assisted performance by enabling communication between people regardless of time and space. Saljo (1998) suggests that as new technologies afford new possibilities for communication, what we consider “learning” may actually begin to shift. Whereas most assessment models at universities are designed to measure a student’s state of performance at a given time, new technologies have the potential to allow us to track changes in performance. Conceptually, this may present us with an opportunity to support and propel movement through the ZPD through appropriate and responsive levels of guided assistance.

Newer Web 2.0 technologies allow anyone to contribute to the world wide web allowing for the collective production of knowledge. There is an increasing movement of the use of the internet from simply gaining access to information toward connecting and collaborating with other people and communities (Brown & Adler, 2008). This suggests that students may more rapidly come to a shared understanding of a topic by using ICT which enables them to discuss, comment, refer, and link to supporting content online (ibid). These methods for collaborative learning which may have traditionally been facilitated by study groups can be fostered using the wealth of online tools available to the 21st century teacher.

While new technologies do allow us to connect in exciting new ways, it is important that we consider learning as that which is achieved through assisted performance within the ZPD. One of the opportunities afforded by new technologies is that of communication, interaction and potentially guided assistance which occurs outside of the classroom in an asynchronous manner. If a more knowledgeable other, in our case the teacher, has an understanding of what students currently know they may be better able to provide timely and effective assisted performance (Gallimore & Tharp, 2002; Luckin, 2008). This can be done by tailoring the next in-class lecture to reiterate ambiguous concepts amongst a group of students or by providing appropriate corrective feedback to an individual student.
Students may also assist each other towards movement through the ZPD. University students are assumed to be at an acceptable level to engage with content that society has deemed relevant and surmountable at their age level (Hedegaard, 1998). However each student comes with a diverse social background which lends itself in various ways to the learning of scientific concepts. The possibility of movement through the ZPD when a student interacts with more capable peers suggests an opportunity for collaborative interaction among peers to lead to learning (Vygotsky, 1978). While there are a range of technologies which allow collaborative interaction, this review will focus specifically on the use of blogs as tools for assisting performance in university activity settings.

**Introducing blogs**

A weblog, or blog as it is most often referred to, is a web based authoring tool available online for creating and publishing content on the web. Synonymous with the Web 2.0 movement, a blog allows anyone to quickly and easily create online content in the form of text, multimedia and links to other web resources. A number of free and easily accessible services\(^1\) are available on the internet which enable anyone to set up their own blog quickly and easily. Many academic institutions now offer blogs as part of their information technology infrastructure (Educause, 2005).

The act of blogging involves compiling written entries regularly over time chronicling or reflecting around a theme. These entries appear in reverse chronological order so that the most recent entry appears first when the blog is accessed. All additional written entries are typically made available categorised by topic category or date published.

In addition to creating content a major feature of blogs is the ability for other online readers to discuss, comment on, create links to, and share the content found on the blog. Comments are usually added to each individual entry are often left in a conversational manner. The writer of the blog can then read and respond to the comments. The afforded levels of interaction available on blogs can be likened to a sort of online social activity as students can read one another’s blog and provide feedback in a conversational manner (Nardi, et. al., 2004). The application of blogs into university activity settings can leverage the fact that students already spend a great deal of time online.

\(^1\) [http://www.blogger.com](http://www.blogger.com), [http://www.wordpress.com](http://www.wordpress.com)
Blogs can be open and accessible to all or secured to a specific community of people. By default blogs are designed to be open to all which means that anyone online can read and comment on them. The main advantage of them being open is that they are potentially exposed to a larger community of readers who may wish to engage with the material (Downes, 2004). Depending on the nature of the blog, commenting and discussion can also be anonymous if the user desires.

Blogs may be used in many distinctly different ways by educators, for example; to share stories of practice with other instructors, to keep in touch with parents, to disperse information to students, or solicit engagement with students (Downes, 2004). This analysis will focus on the latter, where academics have created activity settings which require the use of blogs by students to help mediate learning by facilitating assisted performance.

A blog affords a space for students to record and reflect on what they have learned and externalize how they understand it. The blog is a tool which can aid us in remembering and reflecting on what we have learned. It also enables us to share our understanding with others while gathering feedback. The extent to which universities have exploited blogs as a tool for learning will now be examined.

**Using blogs to extend opportunities for movement through the zone of proximal development**

Blogs afford educators a number of tools for mediating learning. Depending on how the blogging activity is structured blogs may be used for communication, interaction, questioning, debate or reflection. One might consider the scenario in the university classroom, with large class sizes and increased pressures on time, the instructor can not necessarily interact with each student independently at their varying level of understanding. In the university classroom a student does not necessarily have the opportunity to expose the upper limit of their ZPD thereby telling the teacher what information they need to come to an understanding of the course material. The use of blogs may help to give the student “talk time” (Hardman, 2010) outside of the classroom thereby exposing what is needed for learning. Since blogs are open and accessible to the community, both students and the teacher can mediate in potentially problematic or contentious areas.

Blogs may be useful in fostering a community of learners and promoting equality amongst students by allowing them to discover similarities and differences amongst their peers (Downes, 2004). Students who may have normally been silenced in class by more vocal or extroverted peers might be given an opportunity to express themselves more comfortably by contributing to the online blog. Research has
shown that students have been more inclined to express themselves and ask questions in an online semi-anonymous environment because of reduced social imbalances (Ng’ambi & Brown, 2009). The introduction of blogs is one way of encouraging all students to produce and contribute to a body of knowledge.

This analysis will examine the use of blogs to extend the social activity which occurs in the university classroom and will not focus on blogs alone as mediating higher order learning. The activity setting in which the teacher makes use of blogs will play a key role in their contribution to the learning process.

**Literature Review**

This literature review has been restricted to the use of blogs to extend the social engagement amongst the classroom community in the context of a university setting. The literature reviewed covers university courses on physics, information systems, and decision making for information professionals. These subjects cover concepts and material which Vygotsky would term higher order scientific concepts. The learning of these concepts would consequently require mediation by a more knowledgeable other in order to be correctly understood and internalized by a student.

**Blog use in an introductory physics course**

The first article examined how blogs could be used to extend classroom conversations. The study was conducted on an introductory physics course and analyzed over three years (Duda & Garrett, 2008). The blog in this instance was run by the teacher alone and required students to comment and engage with the materials written and posted by the teacher. Comments and online engagement were rewarded with marks towards the student’s final grade. Thus interaction with the blog was a requirement of the course. In this sense the blog was integrated into the course’s system of resources and treated like any other traditional learning resource. The student’s interaction with the blog contributed to their pursuit of a high course grade.

The instructor would compile and share articles which were relevant to the weekly in class lesson yet grounded in student’s real world experience, for example, the ‘physics of television’ or the ‘physics behind photocopying’ (Duda & Garrett, 2008). In some instances the instructor would actually write the articles and in others they might make use of an online resource which demonstrated a concept particularly well. In either case the blog was the conduit of this information. The articles were intended to bring a deeper level of understanding to the students existing knowledge of everyday things. Relating
the scientific concepts of physics to everyday things such as television and photocopying machines enables the student to ground their actual experiences to the theoretical concepts of physics (Hedegaard, 1998).

A survey echoed the student’s appreciation for the instructor’s ability to highlight the relevance of physics in their everyday lives using real world examples transmitted on the blog. While this may have been conducted or transmitted during the class, it is presumed that the instructor had significant pressure to ensure that all of the physics scientific concepts were covered within the classroom. The course blog channelled more informal applications of those scientific concepts for students to explore during their own study time.

In order to receive a grade for participation in the blog, students had to leave thoughtful and articulate reflections on the blog content in the form of comments. Since the comments were individually graded the instructor had to read each one and therefore could gain a sense of how the student’s understood the physics concepts taught in class. This allowed an opportunity for the instructor to give feedback on this understanding, or take note of issues that students collectively were having.

The students had to engage with the material posted by the teacher on the blog as they would with any other assigned reading. The key difference the blog offered was the ability for the student to comment on what they had read and externalize how they understood it. The researchers noted that students often inactive in class became very active when it came to writing on the blog. It was also interesting to note that much of the student’s engagement with the blog occurred late at night, well outside of the conventional hours of instruction. The blog gave students previously without a voice an opportunity to contribute regardless of time and space.

While the findings above seem to indicate the blogs successful integration into the learning activity, we will now focus on how the teacher provided guided assistance using the blog. By making student’s engagement with the blog a requirement of the course resulting in course grades, the instructor made use of contingency management. This motivated the students to provide thoughtful feedback on the posted material in order to receive a grade. The blog provided alternative ways of thinking about the scientific concepts learned in class and required students to provide feedback on their understanding and applications of this new knowledge. The blog facilitated conversations among ‘teacher and student’, ‘student and teacher’ as well as ‘student to student’ with regard to their ideas and questions. Students could see how others had reflected on the blog content contributing to a shared understanding.
of the concepts. Presumably, these online conversations would lead to more questions from the students where additional help was needed in relating the scientific concepts to the everyday applications of physics.

The use of the blog in this physics course created new opportunities for assisting performance and the instructional conversation to occur outside of the classroom. The main objective of the course blog was to connect real world applications of physics to their scientific explanation and make the physics course more relevant to the student’s everyday life (Duda & Garrett, 2008). The blogging activity created a new channel for the discussion of physics concepts. This engagement furthermore allowed reserved students a voice with which to participate in the discussion.

**Blog use in an information system course**

Du and Wagner (2007) researched the impact of the use of student led blogs in a university information systems course. Their assumption was that the use of student blogs could promote both cognitive and social knowledge construction (Du & Wagner, 2007). Additionally, with the instructor acting to support rather than direct the activity of blogging, students were able to take accountability and ownership of the learning process.

A total of 31 students were asked to write individual blog entries on a weekly basis reflecting on their past weeks learning experience. The students were also encouraged to reflect and provide feedback on other student’s blog entries.

The blogging component of the course made up a significant amount of the course mark (24%) and was measured according to how the student cognitively and socially constructed each blogging entry. The cognitive construction of a blog entry involved reflecting on the various scientific concepts discussed in class while discussing them thoughtfully and critically. The social construction of each entry was assessed by the student’s ability to expand on the scientific concepts, relating them to other student’s postings as well as other relevant online content. For the researcher the social construction effort constituted higher order learning as the student was able to draw connections and make sense of the various ideas and concepts and apply them to real world applications. This activity required that the student create links from the concepts discussed in class to their potential application in the real world.

Due to the novelty of grading blog entries in this particular context, the researchers hired two independent reviewers to evaluate the weekly blog grades. The reviewers were inherently familiar with
the course content and learning objectives, as well as highly experienced in teaching and evaluation. Initial blog entries were noted to be quite simplistic, but as the weeks went on and students explored each others blogs, the reflections became much more thoughtful. A third of the students were reported to have continued blogging and ended up creating more than the required number of blog entries for the course.

In analysing the final course results there appeared to be a correlation between high performance in the blogging activity and exam performance. These results indicate that students who had engaged significantly with the blog, reflecting on what they had learned in class (cognitive construction), and linking that to other student’s ideas and other online content (social construction) were prone to better results on the summative examination. It has been proposed that this is due to the added support and feedback offered on each student’s blog entry from other students as well as the instructor. The student was able to receive feedback regardless of time and space thus allowing the student to correct themselves in advance of the summative evaluation.

In this case the blogging activity required the student to reflect on what had been learned in class. Since this reflection was shared online the student was able to take advantage of the social features which the blog afforded to gather feedback on their understanding. Feedback could be used for correcting misunderstandings in advance of the final examination. The learning activity made use of contingency management, feedback and questioning to help guide students through their varying ZPD’s.

**Blog use in a decision making for information professionals course**

Glogoff (2005) conducted his research on the implementation of blogs into a course on decision making for information professionals. This course covered issues such as technological evolution, information architecture and strategic planning. In this example the instructor required the students to publish their individually assigned research reports on their personal blog. An added benefit to the students was that of a guest practitioner, each from a related professional discipline, assigned to each student blog who was made available to comment on the student writings. The practitioner was able to read the blogs and make the comments remotely. Since the student was able to engage with someone actually working in the field they were researching, they were able to gather very personalized experience and feedback. The practitioner could also offer model behaviour for the student to imitate.

Glogoff was able to create an activity setting which fostered feedback and social dialogue between the instructor and students, student to students, as well as bringing a third party expert to comment on the
students writing. The introduction of in an external party to comment on the assignments of each student was made possible because the materials had been posted via the blogs. The blogs provided a social space with which different parties could provide guided assistance to each student. The added benefit to the student was that of feedback from the instructor, peers and an industry professional.

**Discussion**

Much of the focus thus far has been on the successful implementation of blogs in university activity settings. There are additionally a number of cases of blogging experiments gone wrong. Students may reject the blog as a medium of expression and communication (Homik & Melis, 2006), provide less then thoughtful or minimal engagement with the blogs (Krause, 2004), or be hampered by a lack of skills necessary to create online content (Divitini et al., 2005). The important distinction noted in the reviewed articles of successful blog implementation is that of the blog tool being fully integrated into the system of learning activity. To ensure that blogging can be effectively used in a university course it is therefore necessary to firmly embed it in the design of learning activities (Kerawalla et al., 2008). The three discussed cases all made the blogging activity a requirement for grades in the course. This is necessary to ensure that students actually engage with the blogs.

The activity of blogging creates a new opportunity for the communication and discussion of course concepts by the students and instructor. In the reviewed cases, the instructor maintained control of the activities which took place in the physical classroom but created a new virtual space for discussion to take place outside of the classroom. The instructor may have continued to use the class time for didactic lecturing while encouraging discussion to take place on the blogs. The implementation of blogs is therefore considered an activity which does not hamper the instructor’s control or power during regular class time.

The authoring of blogs by students can create opportunities for introverted students to ask questions and engage with the instructor and other students. This creates an opportunity for these students to expose their level of understanding which may have been a challenge given the availability of time in the classroom. The student can reflect on their learning at any moment provided that they have access to a computer. The blogging activity creates an opportunity for the student to open up their ZPD by externalizing how they understand a scientific concept. This increases the potential for the instructor as well as other students to intervene and provide assisted performance in a responsive manner.
In the reviewed literature the blog proved to be an appropriate medium for relating the scientific concepts learned in class with empirical experiences. This is vital to learning as it allows the student to apply the scientific concepts to their own understanding of the world. The ability for students to collectively discuss these connections can contribute to a shared understanding of a concept.

Organizing and assessing activities which use blogs takes a considerable investment in time. Since the blog is a new tool, its implementation requires a change in traditional academic practice. The literature does suggest a number of benefits to students learning when implemented well. Blogs can help to create a sense of community outside the classroom, encourage discussion and feedback, give a voice to introverted students, and help create applications of real world to scientific concepts.

**Conclusion**

This paper has examined three cases of blogs successful integration into university activity settings. Blogs can be used to gather feedback on instructor generated content, provide a space for student reflection, and facilitate assisted performance by allowing ‘teacher to student’, ‘student to teacher’ as well as ‘student to student’ activity and dialogue. Blogs have the potential to enrich students learning experience at university by giving them a new channel which they can use to communicate with others and gather feedback as they progress. The reviewed literature suggests gains in student performance with the introduction of blogs into university activity settings. Blogs certainly increase the number of conversations and debate to include those that happen outside of regular class time. Perhaps the greatest advantages offered of ICT and specifically by blogs is the potential for engaging in dialog regardless of time and space among a community of learners.
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