

Fair go with Web 2.0: Effective strategies for the democratisation of learning and teaching processes using Web 2.0 technologies

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Abstract

This paper is a review of literature from 2009 to 2013 regarding the effective use of Web 2.0 technologies as democratising agents of learning and teaching processes in higher education. Web 2.0 technologies inherently facilitate core aspects of democratised learning, a concept addressing equal opportunity in the classroom. Such opportunities include: equal access to appropriate learning tools, the subversion of barriers that hinder participation, and the blurring of lines that demarcate traditional student-teacher roles. This review has (1) identified how Web 2.0 technologies have been implemented into university level instruction, and (2) analysed the utility of such implementations in democratising pedagogical processes. Relevant literature was gathered via a systematic collection process from a number of educational databases. This review has found that when Web 2.0 technologies are applied within an appropriate pedagogical model they prove to be effective agents in the democratisation of learning and teaching processes.

Keywords: Web 2.0, democratisation, higher education, online, learning, teaching

Introduction

A Web 2.0 technology can be defined as an online platform that enables the end-user to break away from their traditional role as a pure consumer of online content and assume the role of a co-author, host, critic, and transitional agent of digital information. Such characteristics facilitate the formation of collective intelligences, shared knowledge repositories, and diverse communication channels that allow open and decentralised dialogue; transcending traditional physical and pedagogical bounds (O'Reilly, 2005). The democratisation of learning and teaching processes refers to: the equalisation of student-teacher roles in influencing the nature, creation, and transition of knowledge; the subversion of social and cultural barriers that hinder participation; and equal access to appropriate learning tools. This paper presents a review of the literature and an examination of the implementation of Web 2.0 technologies in higher education. Focus is placed on an analysis of how they can facilitate a democratisation of such processes.

Method

Due to the rapid advancement of web technologies, the temporal scope afforded to literature deemed acceptable for this review was confined to 2009 – 2013. Literature reviewed was gathered via a systematic search process using four educational databases: ERIC, Scopus, Web of Science, and Academic Search Premier. Search terms consisted of key terms and pedagogical concepts, including: learning, teaching, Web 2.0, higher education, social networks, blogs and wiki, constructivism (the theory that students construct knowledge from social experience) ([Sulisworo, 2012](#)) and connectivism (finding and evaluating the current knowledge base is paramount) (Siemens, 2005a) . After each search,

the abstracts of potentially relevant sources were assessed; those deemed irrelevant were excluded. Addressing Web 2.0 issues in higher education served as the necessary inclusion criteria. The ultimate relevancy of each source was then determined after each had been read. Those that did not address student-teacher roles, equal opportunity, or issues regarding the acceptance of Web 2.0 technologies within higher education were excluded (See Table 1 for an overview of implementations and issues). Additional material was gathered by applying the same criteria to references made by papers found via search. Fifty-three papers found to be representative of key trends and core themes from the reviewed literature are referenced within this analysis.

Table 1

Implementation	Efficacy & Issues	Article(s)
Web 2.0 traits	User-centricity; communal participation; self-organisation; technology requirements; digital divide	Archambault <i>et al.</i> (2010); Chellilah & Clarke (2011); Deed & Edwards (2011); Conole (2010); Grosseck (2009); Kitsantas & Dabbagh (2011); Samarawickrema <i>et al.</i> (2010);
Blog network (focus of pedagogical model)	Equalised student-teacher roles; distributed knowledge base; increased participation; reduced student isolation; reflection on learning process; collaboration	Bullock (2011); Churchill (2011); Hemmi <i>et al.</i> (2009); Hourigan & Murray (2010); Kang <i>et al.</i> (2011)
Blog network (supplemental to traditional framework)	Replication of accepted knowledge sources	Hemmi <i>et al.</i> (2009)
Student-authored Wiki	Reduced teacher dependency; dialogic communication; social knowledge construction	O'Shea <i>et al.</i> (2011); Huang & Nakazawa (2010); Yang, Suchan, & Kundu (2011)
Cloud-based software (Google Docs, Live@Edu)	Timely student feedback; collaborative rubric construction; lowers financial barriers; social knowledge construction	Denton (2012); Lin & Jou (2012); Stevenson & Hedberg (2011)
Twitter	Timely student feedback; increased participation; reduce student isolation	Forgie, Duff, & Ross (2013); Gao <i>et al.</i> (2012)

Social Network	Online interactions threaten personal and professional boundaries	Cain, Scott, Tiemeier, Akers, & Metzger (2013); Charlton, Devlin, & Drummond (2009); Saunders & Gale (2012)
Propriety peer-tutor system	Reduced teacher workload and dependency;	Cabada, Barrón Estrada, & Reyes García (2011); Cristea & Ghali (2011); Westera, <i>et al.</i> (2009)
Virtual classroom	Increased participation; reduced material requirements	Churchill (2011); Lai (2011); Kear <i>et al.</i> (2010); Lin & Jou (2012); Nicholls & Philip (2012); Sohmdal-Sands & Belbas (2012); T.-C. Huang, Huang, & Yu (2011); Uzunboylu <i>et al.</i> (2011)

Student-Teacher Roles

Web 2.0 technologies have massive potential to blur the lines that demarcate traditional student-teacher roles by virtue of their user-centric nature and focus upon communal participation ([Conole, 2010a](#)). These attributes of Web 2.0 systems enable a decentralisation of learning and teaching concepts to occur. The strictly vertical, top-down design of traditional educational frameworks are able to be subverted, providing the opportunity for increased bottom-up control and horizontal learning contexts ([Samarawickrema, Benson, & Brack, 2010](#); [Tambouris et al., 2012](#); [Uzunboylu, Bicen, & Cavus, 2011](#)). This ‘bottom-up’ control of educational practices, where students have an increased degree of learning responsibility, can be, in part, achieved through student self-regulated learning processes, avenues of formative feedback to instructors that enable students to affect the nature of instruction, as well as dynamic peer-to-peer interactions that permit collaborative learning. ([Cristea & Ghali, 2011](#); [Kitsantas & Dabbagh, 2011](#); [Tsai, Li, Elston, & Chen, 2011](#))

Kang *et al.* (2011), in their case study of blog-based learning in Korea, analysed how the integration of educational blogging into classroom activities affected pedagogical

practices. By including the instructor within a network of student blogs, equilibrium between the role of student and the role of teacher emerged. The locus of knowledge creation, distribution and discussion became a shared commodity distributed between individual blogs, subverting the primacy of the instructor as the sole fount of knowledge. Student and instructor can learn from one another as co-learners ([Bullock, 2011](#); [Churchill, 2011](#)). The collective intelligence of learner groups has caused instructors to reflect, not only upon the information discussed within their respective virtual contexts, but also upon the very nature of how the teaching and learning process is conducted ([Archambault, Wetzel, Foulger, & Williams, 2010](#)). Thus it can be seen that blogs are able to facilitate a pedagogical movement away from unilateral transitions of knowledge and educational decision making towards a student-centred, multilateral framework. However, in instances where blogs have been implemented within an educational context in which students are unaware of their role, they seek to conform to traditional learner paradigms, forgoing true collaborative knowledge construction in favour of mass replication of accepted knowledge sources, undermining any potential shift in student-teacher roles ([Hemmi, Bayne, & Land, 2009](#)).

Wikis, in particular, have been seen to shed hierarchical constraints to facilitate participation in the construction of shared knowledge repositories and engagement in dynamic communication amongst peers ([Yang, Suchan, & Kundu, 2011](#)). In a more drastic study of changing student roles, students were required to participate in the writing of the unit textbook ([O'Shea, Onderdonk, Allen, & Allen, 2011](#)). Such implementations reduce learner dependency on the instructor as they no longer serve as the sole source of information and expertise. However, while a distribution of responsibility regarding learning and teaching processes furthers democratic ideals, the traditional role of the instructor can never be discarded ([Denton, 2012](#)). Teachers are required to establish guidance measures,

allowing students to securely create their own structure without feeling devoid of direction ([DiPietro et al., 2010](#)). Denton (2012) suggests using *Google Docs* to allow the sharing of draft rubrics with students in order to allow them to suggest modifications and gain clarity regarding requirements for assessable tasks. This same online suite has also been suggested as a possible avenue to re-evaluate teaching processes based on student feedback ([Lin & Jou, 2012](#)). The power of collective feedback to reflect student learning experiences can also be facilitated through the use of *Twitter*. It has been suggested that anonymous tweets, delivered after each learning session, enable the instructor to react to student feedback in a timely fashion. Concurrent students are thus able to reap the benefits of their own critiques ([Forgie, Duff, & Ross, 2013](#)).

Proprietary software systems embodying core Web 2.0 concepts have also been deployed in higher education contexts. The testing of a prototype system enabling the automated selection of peer tutors ([Westera, de Bakker, & Wagemans, 2009](#)) has been seen to reduce teacher workload and dependency, however, it requires high student participation to remain effective. Similarly, a learner sustained knowledge repository, overseen by instructors, serves as an asynchronous counterpart to Westera's prototype ([Cabada, Barrón Estrada, & Reyes García, 2011](#)). Another suggested software suite proposes a marriage of those functionalities mentioned previously, allowing students to seek assistance via an adaptive peer tutoring mechanism, as well as directing them to recommended readings and student lead discussion groups (Cristea & Ghali, 2011).

The collaborative, dialogical platforms afforded to students by Web 2.0 technologies has enabled a greater sense of governance to be exerted by them in regards to how and what they learn. As such, the role of the instructor has shifted towards that of a facilitator, one who guides and empowers student centred learning processes. (Archambault, et al.,

2010; [Huang & Nakazawa, 2010](#); [Martin & Noakes, 2012](#); [Narayan, 2011](#); [Naughton, Smeed, & Roder, 2011](#))

Equal Opportunity

Due to the global massification of higher education since the late 20th century ([Lai, 2011](#)), especially that of the Australian system ([Gray, Chang, & Kennedy, 2010](#)), higher education institutions have experienced a diversification of their learner populations. While the barriers of culture, distance, and socio-economic status threaten to undermine egalitarian approaches to learning and teaching as a result, Web 2.0 technologies can facilitate action to transcend such boundaries ([Stevenson & Hedberg, 2011](#)).

The provision of inclusive and equal learning and teaching experiences to isolated distance students has been enabled by a variety of technologies that help expand the classroom beyond its physical limitations ([Chen & Bryer, 2012](#); [Gray et al., 2012](#)). Video conferencing software permits face-to-face interactions with instructors and students (Archambault, et al., 2010), while a combination of recorded class workshops and virtual environments allow drama students who cannot physically participate in group sessions to nevertheless view and interact with their peers ([Nicholls & Philip, 2012](#)). Such implementations contribute to students feeling a sense of communal belonging and engagement unattainable via traditional methods. An online distance program designed for students from New Zealand who were not able to attend classes and meet supervisors (Lai, 2011) was shown to mitigate attrition rates of doctoral candidates who had previously felt intellectually isolated.

Cultural and social factors can also result in students harbouring feelings of isolation within traditional learning contexts. Asynchronous Web 2.0 communication technologies can help to increase the participation levels of students whose anxieties and/or language and speaking difficulties hinder them in responding to in-class discussion “on the spot” ([Huang, Huang, & Yu, 2011](#)). Large cohorts, wherein students struggle to find a voice or a time to participate, create similar challenges which can be overcome in the same manner (Churchill, 2011; [Kear, Woodthorpe, Robertson, & Hutchison, 2010](#); Lin & Jou, 2012; [Saunders & Gale, 2012](#); [Somdahl-Sands & Belbas, 2012](#)). Twitter and blogs have been demonstrated to be the most effective in reducing student isolation and in equalising participation rates (Forgie, et al., 2013; [Gao, Luo, & Zhang, 2012](#); Hemmi, et al., 2009; [Hourigan & Murray, 2010](#)).

While there are costs associated with the development of proprietary Web 2.0 software solutions, most Web 2.0 technologies considered for educational purposes are free-to-use, ultimately lowering financial restrictions to students and institutions alike ([Grosbeck, 2009](#); Stevenson & Hedberg, 2011; Westera, et al., 2009; Yang, et al., 2011). However, while facilitating the creation of an egalitarian learning environment, the implementation of Web 2.0 technologies is nevertheless contingent upon institutional and student access to the internet and appropriate equipment. Developed countries show near universal access to the internet at both the residential and institutional level ([Deed & Edwards, 2011](#)), whilst some developing nations are not so fortunate ([Lwoga, 2012](#)). Access to equipment necessary for students to participate in dedicated Web 2.0 activities is also an issue. However, like internet access, institutions are able to loan students equipment to maintain equity (Narayan, 2011).

Instructional Efficacy

Students and instructors alike were often reticent to engage with social networks in an educational context, believing such interactions could inappropriately cross personal and professional boundaries ([Cain, Scott, Tiemeier, Akers, & Metzger, 2013](#); Saunders & Gale, 2012). However, resistance was lowered when intrusive characteristics of such implementations (forced student-student/student-teacher interaction in personal space) were mitigated with the addition of third-party applications ([Charlton, Devlin, & Drummond, 2009](#)).

While it is often assumed that students of the digital generation regularly engage with social technologies (Deed & Edwards, 2011; Kitsantas & Dabbagh, 2011), this does not necessarily mean they will be able to utilise them effectively academically. Similarly, it has been shown that merely exposing instructors to Web 2.0 technologies is insufficient in the development of technology based curricula; training, guidance and support for both parties is required to use technology effectively for coursework. This is especially true for those students and teachers who are not deemed 'digital natives', as such technologies are often confusing for new users. ([Chelliah & Clarke, 2011](#); [Conole, 2010b](#); Gao, et al., 2012; [Hilburn & Maguth, 2012](#); [Terrell, Richardson, & Hamilton, 2011](#); [Tilfarlioglu, 2011](#)). Furthermore, only when motivational leverage is present, such as assessable goals that are tied to Web 2.0 use, do students express a keenness to utilise the technology (Churchill, 2011; Sulisworo, 2012). However, the particular effectiveness of one experimental implementation resulted in students requesting it to be continued beyond the period of study (Cristea & Ghali, 2011). Finally, it must be noted that while educational Web 2.0 implementations can produce high learning outcomes (Westera, et al., 2009), they vary little compared to alternative instructional methods ([Liu, Kalk, Kinney, & Orr, 2012](#)).

Summary and Conclusion

While it is evident that Web 2.0 technologies harbour the requisite characteristics to enable democratised learning and teaching processes within higher education, empirical research regarding their implementation to egalitarian ends is lacking ([Andrade, Castro, & Ferreira, 2012](#); Kitsantas & Dabbagh, 2011; Stevenson & Hedberg, 2011).

Those papers nevertheless concur in asserting that attempts to integrate online learning within a traditional, pre-digital framework are ineffective, and that reference to connectivist or constructivist principles may be beneficial in working around this pedagogical-practice mismatch (Chen & Bryer, 2012; Hemmi, et al., 2009; Lai, 2011; [McLoughlin & Lee, 2010](#); Sulisworo, 2012). Both technology and teaching practice and policy must serve as enabling agents of this pedagogical change (Bullock, 2011; Conole, 2010a; Narayan, 2011).

However, only after thoroughly investigating the nature of any proposed pedagogical paradigms that can successfully and effectively embed Web 2.0 technologies into their learning and teaching processes can the democratisation potential of such technologies be considered for further research. As it currently stands, there is no concrete empirical research into how Web 2.0 can create democratised learning and teaching processes as the collective of current Web 2.0 technologies, as well as their varying levels of acceptance amongst students, instructors, and institutions, is so fragmented. ([Vance, 2012](#); [Yoo & David Huang, 2011](#))

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