

Social media for collaborative learning: A review of school literature

Michael Henderson, Ilana Snyder, and Denise Beale
Monash University, Australia

Social media are widely seen as having transformational potential in school education. However, there is a surprising lack of empirical research in schools about pedagogical designs using social media and particularly the factors that facilitate or hinder desirable outcomes. Consequently, this article offers a review of the limited empirical research literature, and is unique because it not only focuses on school contexts, when the literature is dominated by the tertiary sector, but also because it carefully excludes uses of social media that do not leverage its particular affordances, that is, social interactivity. A synthesis of the literature resulted in a series of design principles for educators, including three broad conclusions that social media for collaborative purposes is best utilised when: (a) social media is not redundant to current practices but offer something new, (b) strategies are in place to help students learn how to work collaboratively, and (c) the tasks are appropriate.

Keywords: *social media, web 2.0, school, literature review*

1. Introduction

The potential of social media to increase interactivity and collaboration to benefit learning was recognised early (e.g., Desilets & Paquet, 2005; Knobel & Lankshear, 2006; Richardson, 2006) and considerable research to date has been conducted in higher education (for systematic reviews, see Greenhow, Robelia & Hughes, 2009; Minocha, 2009). However, in the schooling sector, empirical research literature is more limited, despite scholarly interest in the benefits of social media applications (e.g., Bryant, 2007; Burnett & Merchant, 2011; Lankshear & Knobel, 2011). In addition, the relatively small amount of literature available inconsistently refers to other research from the sector, which is perhaps a consequence of being spread thinly across a gamut of educational disciplines (e.g., literacy, mathematics, child development) as well as drawing on different methodologies and different theoretical standpoints (and in many cases without theory). The result is a poorly defined body of literature which cannot easily be leveraged by practitioners to help in their design of educational experiences, or used by researchers in further refining our understanding of the issues. Consequently, this review provides a much needed consolidation of empirical research findings into the uses of social media in school settings. This review helps to discern the shape and focus of research conducted to date and, drawing on the approach of Hew, Cheung and Ng (2010), to reveal possible future research trajectories by considering the factors that facilitate or hinder effective use of social media for teaching and learning purposes in schools.

1.1. Defining social media

There is no universally agreed definition of social media, nor uniform terminology, consistent with rapid technological developments and evolving conventions and uses (Burnett & Merchant, 2011). Often researchers use terms such as Web 2.0 (Greenhow, Robelia & Hughes, 2009), social networking (Livingstone & Brake, 2010), social software (Owen, Grant, Sayers & Facer, 2006; Minocha, 2009) or simply the internet. Web 2.0 is the most frequently used term in relation to social media, however it's meaning has changed over time, and is often mistakenly used by teachers and academics to refer to any dynamic website regardless if it involves social, cooperative or collaborative interactivity. In recognition of this confusion in the literature, this review uses the term 'social media' because it emphasises social interaction, reflecting the authors' interest in leveraging the unique affordances of the technology in facilitating students, teachers and others working with each other for a variety of purposes.

We have adopted Kaplan and Haenlein's (2010) definition of social media as 'a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content' (p. 61). These interactive applications encompass, amongst others, social networking services (eg. Facebook), blogs (eg. Blogspot), microblogs (eg. twitter), wikis (eg. wiktionary.org), forums (eg. minecraftforum.net), video sharing (eg. YouTube), and image sharing (eg. Flickr) enabling people to connect for purposes of 'collaboration, contribution and community' (Anderson, 2007, p. 14). The definition also includes virtual worlds (eg. SecondLife) and massive multiplayer online role playing games (eg. World of Warcraft) however these have been excluded from this review due to their diversity and complexity which require a more detailed response than can be given here.

It is important to recognise that wikis, blogs and other social media can be used in ways that take no advantage of the technology's social affordances. For instance the researchers have noted the use of Facebook by teachers to inform students of upcoming assessments. However, the same task could be accomplished by email, and does not leverage the networked environment beyond the fact that a network exists. As a consequence, this review carefully excludes or otherwise considers critically those studies where social media are used essentially as one-way publication or broadcast sites. We recognise that such usage may be highly valuable (e.g. the use of a blogging tool to create a portfolio of learning for self-reflection and assessment), however, as we sought to understand the particular opportunities and implications arising from the social interactivity afforded by social media, for the purposes of this review they are not included. The focus then of this article is not the use of social media for just communication, but rather the use of social media for meaningful interactions, particularly characterised by cooperation or even collaboration.

2. Method

We sought to identify studies which investigated the use of social media in schools in order to understand the opportunities and implications which arise from the social interactivity afforded by social media. The review included research studies in journals that focus on teachers and classrooms, conference proceedings (national and international including ACEC, ASCILITE, SITE, EdMedia, etc.) and reports on empirical research or horizon scans (e.g. Educause, The New Media Consortium). Seventeen popular education electronic

databases were surveyed.¹ Results were limited to a date range of 2005 to 2012. A variety of search terms was used with the most useful Boolean construct being: (social media OR web 2.0 OR social network*) AND (education OR school OR teach* OR learn* OR child*). In addition to the databases, twenty four key journals were surveyed by using their own online search functions or by sighting each issue from 2005 to 2012.² Finally the bibliographies of all articles selected from these searches were then scanned in a ‘snowball’ method and further studies located for consideration.

Identifying articles that specifically focussed on children and young people was not easy. The majority of articles returned during the search were from the higher education sector. Eventually 135 articles dealing with children or young people or the school sector in general were retrieved, of which 47 were overviews, conceptual papers and suggestions for practice which considered the role of social media in learning, but did not report on research and were not included in the review. Fifteen research reports which investigated technology use more broadly and in which social media were not the focus were discarded, as were fifteen studies which considered social media, although not for collaborative learning purposes. For instance, where a blog was used to simply publish a student’s work, but which did not leverage any of the social media affordances such as using the comment fields for others to comment on the blog. Another fifteen research reports were excluded, either because they were preliminary findings, lacked detail or did not further understanding. Ultimately forty-three 43 reports of research were included in the review offering insights into the factors that facilitate or hinder effective leveraging of social media for teaching and learning purposes.

In the first stage of analysis, the findings of the articles were extracted and thematically organised by one of the authors. A second author did the same task for 20 of the articles, strengthening reliability of interpretation and thematic organisation. A second stage of analysis included all three authors who iteratively refined the themes from the first stage and synthesised the findings, with constant reference to the original source files. This process led to identifying three broad themes in the research literature surrounding the use of social media in school contexts. First, young people cannot be assumed to know how to use social media for learning. Second, effective use of social media is characterised by (a) extending learning through offering new opportunities that could not be achieved with other media, (b) preparing students to work collaboratively before and during the use of social media, and (c) employing the media for appropriate tasks. The third theme revealed the central role of teachers in the successful use of social media for learning. These themes and their related conclusions and recommendations are discussed in turn below.

¹ A+ Education, APA-FT, Trove, Scopus, Emerald, ERIC, BHI, IBSS, LISA, Social Services Abstracts, Sociological Abstracts, CSA Linguistics and Language Behaviour Abstracts, Proquest, Expanded Academic, ARROW, EditLib, Monash University Catalogue

² American Educational Research Journal, Australasian Journal of Educational Technology, Australian Educational Computing, British Journal of Educational Technology, Children & Society, Cognition & Instruction, Computers & Education, Computers in the Schools, EDUCAUSE Quarterly, EDUCAUSE Review, English in Education, International Journal of Web-based Learning & Teaching Technology, Journal of Adult & Adolescent Literacy, Journal of Children & Media, Journal of Computer Assisted Learning, Journal of Online Learning and Teaching, Journal of Research on Technology in Education, Language & Education, Learning, Media & Technology, Linguistics & Education, Literacy, New Media & Society, Research in Learning Technology, Technology, Pedagogy & Education, Scandinavian Journal of Educational Research

3. Young people cannot be assumed to know how to use social media for learning

As we conducted the review it became clear that the field is awash with optimistic but poorly substantiated claims of the potential for social media in education. In many of the articles this potential seems to be founded on students' affinity for social media in their personal lives. However our review also revealed that such affinity or even frequent use should not be assumed to mean that young people know how to use social media in educational contexts, or for learning purposes.

Children and young people's frequent use of social media is not in question. In the US, social media were used by 73 per cent of teenagers in 2008 (Lenhart, Purcell, Smith & Zickuhr, 2010). In 2009, social media were used by 90 per cent of Australian young people between 12 and 17 and by 51 per cent of those between eight and 11 (ACMA, 2009). In 2011, 65 per cent of Australian internet-using young people between the ages of 9 and 16 were reported to have a profile on a social media site (Green, Brady, Olafsson, Hartley & Lumby, 2011) and social media had been used by 94.9 per cent of 1004 Victorian students in Years 7 to 10 (de Zwart et al., 2011). Similar findings have been reported in the US, the UK and Europe. However, as Livingstone and Haddon (2009) attest, there is a risk that children and young people's frequent use of digital technologies and social media is conflated with proficiency and effectiveness.

Studies that have explored young people's use of technologies in their everyday lives as well as in educational settings draw a more nuanced picture, contesting the assumption of uniform skill (Barron, Walter, Martin & Schatz, 2010; Calvani, Fini, Ranieri & Picci, 2012; Eynon & Malmberg, 2011; Ito, et al., 2008; Sweeney & Geer, 2010; van den Beemt, Akkerman & Simons, 2010, 2011). The findings from these studies mean that a first consideration for policy regarding social media use in educational settings should be based on the assumption that not all students are familiar with a range of different media, that they use them all equally or that they are proficient users. Within schools, studies suggest that students used social media mostly to upload photos and to keep in touch with friends, and Google and Wikipedia for searching. Researchers noted that few students wrote blogs or participated in online forums (e.g. Clark, Logan, Luckin, Mee & Oliver, 2009; Luckin, Clark, Graber, Logan, Mee & Oliver, 2008, 2009). The majority of students were engaged in 'consuming' rather than 'producing and publishing' (Luckin et al., 2009: p. 94), consistent with the findings of other studies (e.g. Barron et al., 2010; van den Beemt et al., 2010) social media were not considered to be learning technologies.

Young people's orientations to social media as leisure, communication and informal information-gathering applications create inherent 'tensions' in adopting these media for learning purposes (Crook, et al., 2008, p. 33). It is evident that the re-envisioning of social media as educational needs to take account of these orientations and work actively to legitimise new uses that build on students' existing learning but also develop learning with applications that may be unfamiliar.

4. Effective use of social media

The review clearly demonstrated instances where social media had a valuable role in facilitating the cooperative or collaborative engagement of teachers, students and others in the learning process. For instance, connections with teachers can be made between different physical locations and outside specified class times (Chandra & Watters, 2012; DeGennaro, 2008), with groups outside the class such as other students at different levels of education (Gomez, Schieble, Curwood & Hassett, 2010; Maher 2009, 2010), with external experts

(Hastie, Casey & Tarter, 2010) and with the wider community (Valk, et al., 2011). Within the classroom, social media can be employed to enhance students' collaboration on group tasks (Liu, Liu, Chen, Lin & Chen, 2011; Pifarre & Fisher, 2011), as well as to draw on the knowledge and skills of others to enhance their own (Zhang, Scardamalia, Lamon, Messina & Reeve, 2007). Students can use the media to provide feedback and support to peers, and also share work with an audience beyond their teacher (Duncan-Howell & Lloyd, 2008; Hastie et al., 2010). These same affordances enable teachers to monitor students' progress more closely as well as to provide timely guidance and feedback (Hastie et al., 2010; Zywicka, Richards & Gomez, 2011).

By contrast, there are other studies which have investigated the use of social media for learning by school students and have reported disappointing results. Students can be reluctant to comment on each other's work when using social media. They may complete to a required minimum level or not engage with the work of others (Grant, 2009; Joubert & Wishart, 2011). When completing a joint task, such as wiki writing, students have been shown to be hesitant to alter others' work and protective of their own (Liu et al., 2011). When working with students outside of school, contact is often confined to expressions of support or to the coordination of their activities, rather than extending their learning through higher level exchanges (Duncan-Howell & Lloyd, 2008). When opportunities have been provided for students to communicate with strangers via social media, for learning purposes such as in an English as a Foreign Language context, or with unknown students in other schools, students have been found to engage in what teachers can regard as distracting exchanges (Maher, 2009), or to engage only when their teacher requires it (De Almeida Soares, 2008). Interaction between students within the same class or school or with others outside it can be inappropriate or abusive (Geer & Sweeney, 2010; Maher, 2010).

Disappointing results have also been noted when social media are used within a task where face to face collaboration is already high, and consequently social media are automatically redundant (Heafner & Friedman, 2008). Also, where social media are used for tasks which are unrelated to the curriculum or not obviously linked to learning purposes, successful use is unlikely (Tan, 2009; Wishart & Triggs, 2010).

The above provides a glimpse into the diversity of findings from the research literature. A synthesis of those findings suggests that effective use of social media for collaborative learning requires clear pedagogical designs and purposes which: (a) extend learning through offering new opportunities (b) prepare students to work collaboratively with social media and (c) employ social media for tasks which are appropriate. The following sections address each of these conditions.

4.1. Extending learning through offering new opportunities

Studies which capitalise on the new opportunities that social media afford demonstrate the potential for learning, in particular through providing:

- (1) contact with outside experts;
- (2) an audience beyond the teacher;
- (3) meaningful contact between teachers and students working on the same activity out of school;
- (4) ways for students to view and build on the work of others in their group or class;
- (5) purposeful interaction between students in different schools, levels or classes across time frames and distance;
- (6) a means to enhance the participation of all students;
- (7) a facility for timely feedback from teachers and peers.

Examples from the review are provided below to illustrate some of the ways these opportunities have been utilised.

Social media permit students to make contact with other people beyond their classroom teacher in ways which add expert knowledge of the subject matter. Students can be motivated by such contact to test and extend their ideas as in Hastie et al.'s (2010) study of a class of Years 10 and 11 British secondary school students. In a group wiki writing task, an American professor, a games expert, and his graduate students provided expertise and an external audience for the class. The researchers reported that students were excited by the outside audience and resulted in a high degree of participation. An audience beyond the teacher was provided through the medium of the wiki, one which would not otherwise have been available to them. As well, students showed considerable interest in the wiki task, posting comments on it outside school hours, and benefiting from comparing their work with others after class. Similarly, in Mak and Coniam's (2008) study of Year 7 students in Hong Kong it was reported that the knowledge that parents were to be the audience for their group wiki writing task rather than simply the teacher added to students' motivation.

Contact between teachers and students or amongst students outside of school hours and from different locations makes new learning connections achievable. A study (Chandra & Watters, 2012) in an Australian secondary school investigated whether Year 12 students' learning in Physics could be improved by incorporating social media through after school chat session as one component in a series of lessons designed around a website, *Getsmart*. Analysis of student chat demonstrated that they focused on extending their conceptual understanding through reflecting on their answers and learning from others. Interaction between teachers and students allows for different types of learning opportunities which can also take place outside class contact hours.

Students can view and build on the work of others in their group or class as they develop and extend new ideas. Zhang et al.'s 2007 study of a class of Grade 4 children in Canada using the group workspace called Knowledge Forum (Zhang et al., 2007), informed by Scardamalia and Bereiter's (2006) knowledge building principles, showed the students recording ideas, uploading material and commenting on each other's work. Students' post-tests showed significant gains in their scientific knowledge. Through building on each other's ideas in the interactive space, the children gained new understandings. Pifarre and Fisher (2011) in a study in Spain with 9-10 year olds writing in a wiki concluded that the collaborative process and the ongoing discussion during the writing phase enhanced the students' understanding of the nature of a writing task, as they learned from the comments and changes made by others.

Interaction amongst students can occur within the same class but can also be extended to students in other classes and physical locations, as in the study of the Dissolving Boundaries program which connected teachers and students across 150 schools in Northern Ireland and the Republic of Ireland, using social media within Moodle, over time moving from coordination to collaboration (Austin, Smyth, Rickard, Quirk-Bolt & Metcalfe, 2010). In a study of secondary and primary school students communicating with each other via social media in a transition program, Maher (2010) found that the shared exchanges facilitated understanding of new norms and supported other transition activities.

In these studies, new opportunities for interaction could be afforded through interactive sessions in which the teacher's participation was crucial. His or her authoritative knowledge enhanced the importance of exchanges between students and teachers and also legitimised the social media spaces as a site of educational practice designed to enhance content knowledge (Chandra & Watters, 2012). Different forms of social media offer a means to enhance the participation of all students. Hastie et al. (2010) found that the wiki enabled less athletic boys

to participate more positively in a game activity than they may have been able to otherwise. Chandra and Watters (2012) noted that the interactions through the chat facility between teachers and students in their homes enabled the participation of those who might not normally do so in the classroom, although collaboration *between* students was more limited.

Timely feedback from both teachers and peers is another benefit. Hastie et al. (2010) found that students modified their wikis after hours and the teacher could monitor these and provide feedback. Pifarre and Fisher (2011) also investigating wikis, noted that the ability to review each student's changes to the wiki meant that the teacher was able to judge students' individual participation and progress. The chat facility employed by Chandra and Watters (2012) meant that the teacher could give positive feedback immediately which motivated students to prepare more actively for the session. Zhang et al.'s (2007) study found that the teacher's online feedback suggested new lines of inquiry and posed questions which stimulated the children's higher-order thinking. Students could also view the ideas of their peers and build on the work of others.

4.2. Preparing students to work collaboratively

Social interaction, cooperation or collaboration for learning do not simply follow the introduction of social media. Within schools, where it is the norm for individual work to be produced for assessment, students may not know how to collaborate for learning purposes (Grant, 2009; Lund, 2008).

Collaborative work is more likely to succeed when preceded by careful preparation. Effective preparation includes:

- (1) an explanation of the purpose of collaboration and how it benefits all students;
- (2) explicit processes developed for students to work together collaboratively;
- (3) collaboration through small group work to build trust;
- (4) teachers monitoring interaction to ensure that collaboration is inclusive and that behaviours within interaction are appropriate and not hurtful or damaging;
- (5) teachers allowing students to make more decisions about their learning;
- (6) teachers encouraging all students to participate.

An explanation of the purpose of collaboration and how it benefits all students is an important initial step in the use of social media. In a school environment, where students are used to working on individual tasks for assessment, collaboration may disturb existing understandings of the purposes of particular tasks (Lund, 2008). Lund (2008) noted that students, given the task of working together in a wiki, began by working in pairs moving to more collaborative work only when the initial task was completed. Drawing on Lund's insight, researchers in Spain developed a three stage process designed to teach collaborative skills in preparation for a wiki writing task which aimed to enhance the writing processes of 9 to 10 year old children (Pifarre & Fisher, 2011). The first stage of the process involved the development of 'collaborative talk' (p. 455). In the second stage, students worked in pairs to construct a text. In the third stage, the teacher demonstrated the collaborative process of wiki writing and how it allowed students to discuss ideas and elaborate or modify them. Students' understanding of the task was improved by the discussion embedded within it and the feedback from their peers. Clearly there is a need for explicit instructions on how to use the platform and how to work collaboratively. Wong and Hew (2010) confirmed this, but also found that there is a need for explicit discussions that clarify the purpose or goal of the learning exercise. In their study of primary school students using blogs, they found that without these discussions the students corrected each others' use of language rather than offering higher order comments on the narrative.

Where contact is with participants within the same group, as in Wong and Hew's (2010) study, the teacher's role in valuing the participation of all students and moderating participation is crucial to establishing new norms of social behaviour to instil trust in the medium and the participants (Chandra & Watters, 2012; Hastie et al., 2010; Zhang et al., 2011). Geer and Sweeney (2010) report on teachers' experiences with online forums (Edublogs and forums within Moodle) in two primary schools. For each of the teachers, the process of introducing the applications into their classrooms involved changes in their pedagogy, with a greater emphasis on small group work and student decision-making. There was also a greater need to monitor students' behaviour to ensure that their interactions were appropriate. Developing strategies to shape and monitor students' behaviour in interactive spaces is a recurring theme in several of the studies (e.g. Geer & Sweeney, 2010; Liu et al., 2011; Maher, 2010) which note that new complexities between openness and flexibility need to be negotiated. Teacher moderation and small group work assist to build trust when the interaction occurs between participants who have not met face to face. Trust is a vital element in achieving high levels of collaboration for both teachers and students and can be achieved through an initial period of online socialising (Maher, 2009). In Maher's (2009) study online chat sessions between primary and secondary students required more time allocated to social chat as students needed to establish their identities with strangers when there were no visual or auditory cues. Such social chat was necessary in the online learning environment for students to develop sufficient trust in each other before learning could proceed. The role of teachers in mediating these challenges through their knowledge of external participants is an important factor in building trust (e.g. de Almeida Soares, 2008; Hastie et al., 2010).

These studies share several important similarities. Successful collaborative work in which individual entries cannot readily be distinguished demands careful thought by educators about the social and cultural context, which varies across these studies, as does the age of the students. However, all students showed some degree of concern about the status of their own entries – about when they could be modified or removed by others. In addressing this concern several researchers (Mak & Coniam, 2008; Pifarre & Fisher, 2011; Wong & Hew, 2010) suggest the value of a staged process in which students move from individual or pair work to a collective process. In a different approach, Pifarre and Fisher's (2011) study suggests that preparation for the collaborative nature of a task through 'talk' is a valuable precursor to such a task. Training in the particular social media application was provided in most of the studies reviewed, however careful preparation is also needed to support students' collaborative skills in the peculiar and often unfamiliar environment of social media as a learning space.

4.3. Employing social media for appropriate tasks

Social media technologies need to be chosen carefully to suit the task and to fit the pedagogical design. The reviewed articles clearly demonstrate that careful design is critical for effective social media use. It should not be assumed that social media can be applied to existing tasks which are designed for other methods of instruction. The kinds of tasks for which social media are to be used need to be appropriate and purposeful.

The literature reviewed revealed examples of tasks which facilitated effective use of social media for students by offering:

- (1) clear links with the curriculum and explicit guidelines about assessment;
- (2) a purposeful application of the technology to achieve a shared and meaningful goal;
- (3) opportunities for collaboration;
- (4) the preservation of students' original work as this reduces their level of task anxiety and they will be more likely to interact with other students' work;

- (5) the opportunity to track their changes and to consider their progress;
- (6) the opportunity for teachers to stimulate new lines of inquiry and provide feedback and encouragement;
- (7) extended time for an activity which can be developed in stages and extend over a number of sessions.

Tasks which have clear links with the curriculum in place in schools enable ready incorporation of social media. Wishart and Triggs (2010) review the implementation of a project across five European countries which aimed to connect 27 schools and their students with cultural artefacts in museums, art galleries and other similar institutions. While students worked together in groups and incorporated feedback from parents and friends, alignment with the curriculum was the most significant factor in the successful implementation of the project. Factors which work to impede successful implementation of social media initiatives for learning are demonstrated in Tan's (2009) doctoral research, which investigated the use of a Web 2.0 learning platform dubbed the Student Media Centre in an Australian secondary school. The platform was selected by the school leadership but led and maintained by 30 senior students in Years 10, 11 and 12. Overall, the majority of students in the school did not use the digital centre, regarding it as '*useful-in-principle but useless-in-practice*' (p. 291, emphasis in original). With no relationship to curricular learning and tightly controlled, it was an adjunct which seemed to have limited purposes to the majority of students.

The literature also revealed the need for the social media tasks to be purposeful and that purpose to be clearly communicated with the students. Joubert and Wishart (2011) concluded that it is necessary for participants to fully understand the nature and purpose of the task to be completed and to have a sense that their participation is important to achieve an outcome, that is, that the task is purposeful for them so that they have 'shared goals' (p. 9). A similar finding as to the relevance and appropriateness of the task is borne out in Grant's (2009) study of three Year 9 ICT classes in a British secondary school using a wiki. In this study the wiki environment could afford the opportunity for both collaboration and an audience, but the type of task to which it was applied, editing each others' work, did not invite collaboration. It also mirrored those required of the students for assessment, with no audience other than the teacher. In addition, it was found that if a task already incorporates high levels of face to face collaboration, the use of social media is likely to be redundant (Heafner & Friedman, 2008; Marttunen & Laurinen, 2007). Even those tasks which require the use of social media to complete an assessment often result in a minimal level of participation if they have not been incorporated in a meaningful way (Joubert & Wishart, 2011).

The majority of studies are premised on the notion that collaboration is a key affordance of social media. The review indicated that a student-centred model is more likely to effectively facilitate collaborative learning with social media than a teacher-centred one. This is, in part, related to the fact that teachers are limited by the time they can provide to each student whether in class or online. In contrast, social media such as Blogs are well suited to providing students with a platform to write to a larger audience, soliciting feedback and discussion about postings, facilitating reflection, self-editing and setting new goals.

However the review indicates that while collaboration is an affordance of social media, the tasks also need to be carefully designed to leverage that affordance. Tasks utilising social media which elicited beliefs and opinions were found to be less likely to result in valuable discussions (Joubert & Wishart, 2011) than tasks which were focused on enhancing content knowledge (e.g. Chandra & Watters, 2011) or building social relationships as a prelude to interaction (Maher, 2009). Joubert and Wishart (2011) concluded that statements of belief or the construction of a vision were too individual to produce collaboratively. A different

conclusion was drawn in Grant's (2009) study where students chose topics to write in a wiki and were tasked with editing each others' writing. Grant noted that the students rapidly developed a sense of 'ownership' of their individual pages (p. 109) and felt that their work was their own and did not see the task of editing as something positive. Only two students modified another's entry and then only in minor ways. A conclusion was that editing of another's assessment transgressed the norms of what is closely held to be individual work. As mentioned in the previous section a number of studies revealed that all of their student participants showed some degree of concern about when their entries could be modified or removed by others. While preparation of students to work collaboratively is one response, another approach is recommended by Liu et al. (2011) who found that preservation of students' original work enabled some students to feel more comfortable with collaboration. In Liu et al.'s (2011) study students whose original stories were preserved, produced more episodes of collaboration with others, whereas those whose original stories were not preserved, were distracted by the effort to protect their own work and experienced more tension with less collaboration. In contrast Lund (2008) argues for the development of new forms of assessment as critical to collaborative work, arguing that existing assessments privilege individual work.

Tasks can be designed to take advantage of the opportunity to monitor or track student changes over time. This can facilitate students' reflection on their own progress as well as aid teachers in providing feedback, including stimulating new lines of inquiry (eg. Zhang et al., 2007) and encouragement (eg. Chandra and Watters, 2012) throughout the task and not just after completion. Mak and Coniam (2008) provide a useful example in their study of year 7 students in a Hong Kong secondary school using a wiki as part of their beginning studies in an English-speaking environment. The researchers found that tracking revisions enabled both students and the teacher to explore the way they developed their ideas. In Hastie et al.'s (2010) study the teacher was able to monitor students' progress through the emails he received when changes were made to the wiki and subsequently to provide feedback. In addition, students benefited from comparing their work with others after class as well as from the suggestions made by the external audience who commented on their work.

Extended time for an activity is also important to enable successful learning with social media as tasks can take longer due to the demands of technology, of the need to learn to use the technology appropriately, of scheduling across different spaces and times, and the need for more extended social chat as a means of developing relationships (Wishart & Triggs, 2010; Maher 2009, 2010). Most social media such as blogs, wikis and forums are asynchronous and as a consequence students need to take turns if they are to engage meaningfully with each other's work. The opportunity for careful and deliberate response is commonly argued as an advantage of asynchronous social media however since the turn taking is not as fast as verbal interactions, and can take hours if not days for each response, activities may need to be extended over a period of time, particularly if the collaborators are in other schools or even overseas, when timetabling or different time zones mean that responses cannot be made speedily (Austin et al., 2010).

5. The central role of teachers

The articles reviewed clearly indicate that teachers are central to the effective implementation of social media, through their careful planning, task design, the exercise of their authority and their ability to deploy social media in ways which reconceptualise them as educational. In this way, they build on students' leisure uses of social media to develop and enhance new practices for learning. However, the studies also point to factors which may inhibit teachers'

adoption of social media into their professional practice. Teachers' beliefs about the greater workload required to incorporate social media into their practice can discourage them from doing so (Lai & Chen, 2011). Indeed, several of the studies reviewed attest to the greater workload involved in the early stages of social media use, particularly when teachers require new skills in specific applications and when they may need to interact with students or their colleagues out of school (Chandra & Watters, 2012; DeGennaro, 2008; Geer & Sweeney, 2010; Hastie et al., 2010).

Teachers also vary considerably in their skills and confidence with social media for educational uses and can often encounter technical difficulties working with new technologies and applications which can cause them to disengage (Wishart & Triggs, 2010). However, as Zhang et al. (2007) found, teachers are highly motivated by the desire to develop their students' learning capacities and consequently will invest themselves if the advantages of using social media are made clear. In a later study Zhang et al. (2011), like many researchers in the field of professional learning, found that teachers can be particularly supported in engaging with social media through ongoing professional learning communities and effective leadership.

6. Conclusion

The review has revealed a limited research base, especially in terms of empirical studies focussed on school contexts. The studies that do exist illustrate the social complexity and pragmatic instrumentalism afforded by social media in the lives of students and for the purposes of learning. The majority of studies investigating the use of social media in classrooms are focused on first uses of social media by teachers or researchers in one or small numbers of classrooms. There are very few studies that compare applications across contexts. Consequently, there is a need for future research to clarify the contextual issues of use, particularly for in-depth research which explores students' learning (not just attitudinal change) in and out of classrooms with social media.

At the same time, the studies reviewed allow some conclusions to be drawn which can enhance the adoption of social media. In the majority of studies, students enjoyed working with social media in their schools even when teachers or researchers considered the outcomes to be unsuccessful. Students' differing learning styles could be taken into account and learning could occur both within and outside the classroom which heightened students' engagement with their content (DeGennaro, 2008; Hastie et al., 2010; Heafner & Friedman, 2008; Zhang et al., 2007). Their enjoyment and existing skill with some forms of social media provide a solid foundation on which to construct new learning opportunities. However, as noted earlier in the review, students must not be assumed to be skilful users of a variety of social media applications. Those most likely to be used in schools are blogs, microblogs and wikis, with which students are least likely to be familiar. Explicit teaching is necessary to provide skills in the particular application to be employed. Building understanding and experience with new applications in a careful pedagogical way will legitimise social media as learning technologies, contributing to a reshaping of students' perceptions of social media as not simply affording leisure and communication.

The studies revealed that social media were utilised most effectively for learning purposes when pedagogical design considered: (a) how the media could extend learning through offering new opportunities such as working with outside experts and receiving timely feedback; (b) the need to carefully prepare for students' collaborative use of social media such as developing explicit processes to support and educate students to work together

collaboratively; (c) when it is appropriate to employ social media for tasks, such as when there are clear links with the curriculum and when strategies are used to facilitate collaboration, such as preserving students' original contributions. The review also clearly indicated that teachers are central to the effective implementation of social media, through their careful planning, task design, the exercise of their authority and their ability to deploy social media in ways which reconceptualise them as educational.

References

- Anderson, P. (2007). *What is Web 2.0? Ideas, technologies and implications for education*. UK: JISC Technology & Standards Watch. Retrieved from www.jisc.ac.uk/media/documents/techwatch/tsw0701b.pdf. (20 January, 2012).
- Austin, R., Smyth, J., Rickard, A., Quirk-Bolt, N. & Metcalfe, N. (2010). Collaborative digital learning in schools: Teacher perceptions of purpose and effectiveness. *Technology, Pedagogy and Education*, 19 (3): 327-343.
- ACMA (Australian Communications and Media Authority) (2009). *Click and connect: Young Australians' use of online social media* (quantitative report). Canberra, Melbourne & Sydney: Australian Communications and Media Authority.
- Barron, B., Walter, S., Martin, C. & Schatz, C. (2010). Predictors of creative computing participation and profiles of experience in two Silicon Valley middle schools. *Computers & Education*, 54: 178-189.
- Bryant, L. (2007). Emerging trends in social software for education. In *Emerging technologies for learning* (Vol. 2) (pp. 9-18). Coventry: Becta.
- Burnett, C. & Merchant, G. (2011). Is there a space for critical literacy in the context of social media? *English Teaching: Practice and Critique*, 10 (1): 41-57.
- Calvani, A., Fini, A., Ranieri, M. & Picci, P. (2012). Are young generations in secondary school digitally competent? A study on Italian teenagers. *Computers & Education*, 58: 797-807.
- Chandra, V. & Watters, J. (2012). Re-thinking physics teaching with web-based learning. *Computers & Education*, 58, 631-640.
- Clark, W., Logan, K., Luckin, R., Mee, A. & Oliver, M. (2009). Beyond Web 2.0: Mapping the technology landscapes of young learners, *Journal of Computer Assisted Learning*, 25: 56-69.
- Crook, C., Fisher, T., Graber, R., Harrison, C., Lewin, C., Logan, C., Luckin, R., Oliver, M. & Sharples, M. (2008). *Web 2.0 technologies for learning: The current landscape – opportunities, challenges and tensions*. Coventry: Becta: BECTA Research Report.
- De Almeida Soares, D. (2008). Understanding class blogs as a tool for language development. *Language Teaching Research*, 12 (4): 517-533.
- DeGennaro, D. (2008). Learning designs: An analysis of youth-initiated technology use. *Journal of Research on Technology in Education*, 4 (1): 1-20.
- Desilets, A. & Paquet, S. (2005). *Wiki as a tool for web-based collaborative story telling in primary school: A case study*. Paper presented at EdMedia 2005, World Conference on Educational Multimedia, Hypermedia & Telecommunications, Montreal, Quebec, Canada.
- De Zwart, M., Lindsay, D., Henderson, M. & Phillips, M. (2011). *Teenagers, legal risks and social networking sites*. Clayton: Monash University.

- Duncan-Howell, J. & Lloyd, M. (2008). *Discussing, sharing and collaborating: Distributed constructionism goes online*. Paper presented at the Conference of the Australian Association for Research in Education, Brisbane.
- Eynon, R. & Malmberg, L.-E. (2011). A typology of young people's Internet use: Implications for education. *Computers & Education*, 56: 585-595.
- Geer, R. & Sweeney, T. (2010). Telling it like it is: Digital journeys. In D. Gron & G. Romeo (Eds) *ACEC2010: Digital diversity*. Conference Proceedings of the Australian Computers in Education Conference 2010, Melbourne 6-9 April, Carlton, Vic: Australian Council for Computers in Education (ACEC). Retrieved from <http://acec2010.acce.edu.au/proposal/508/what-cen-be-learned-digistories-about-contemporary-learning-environments-schools>.
- Gomez, M., Schieble, M., Curwood, J. & Hassett, D. (2010). Technology, learning and instruction: Distributed cognition in the secondary English classroom. *Literacy*, 44 (1): 20-27.
- Grant, L. (2009). "I DON'T CARE DO UR OWN PAGE!" A case study of using wikis for collaborative work in a UK secondary school. *Learning, Media and Technology*, 34 (2): 105-117.
- Green, L., Brady, D., Olafsson, K., Hartley, J. & Lumby, C. (2011). *Risks and safety for Australian children on the internet*. EU kids online, The London School of Economics and Political Science.
- Greenhow, C., Robelia, B. & Hughes, J. (2009). Learning, teaching, and scholarship in a digital age. *Educational Researcher*, 38: 246-259.
- Hastie, P., Casey, A. & Tarter, A-M. (2010). A case study of wikis and student-designed games in physical education. *Technology, Pedagogy and Education*, 19 (1): 79-91.
- Heafner, T. & Friedman, A. (2008). Wikis and constructivism in secondary Social Studies: Fostering a deeper understanding. *Computers in the Schools*, 25 (3-4): 288-302.
- Hew, K., Cheung, W. & Ng, C. (2010). Student contribution in asynchronous online discussion: A review of the research and empirical exploration. *Instructional Science*, 38(6):571-606.
- Ito, M., Horst, H., Bittant, M., boyd, d., Herr-Stephenson, B., Lange, P., Pascoe, C. & Robinson, L. (2008). *Living and learning with new media: Summary of findings from the digital youth project*. The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning.
- Joubert, M. & Wishart, J. (2011). Participatory practices: Lessons learnt from two initiatives using online digital technologies to build knowledge. *Computers & Education*, doi: 10.1016/j.compedu.2011.09.024.
- Kaplan, A. & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, 53: 59-68.
- Knobel, M. & Lankshear, C. (2006). Weblogs, worlds and constructions of effective and powerful writing: Cross with care, and only where signs permit. In K. Pahl & J. Rowsell (Eds.) *Travel notes from the new literacy studies: Instances of practice*. Clevedon: Multilingual Matters Ltd.
- Lai, H.-M. & Chen, C.-P. (2011). Factors influencing secondary teachers' adoption of teaching blogs. *Computers & Education*, 56: 948-960.
- Lankshear, C. & Knobel, M. (2011). *New literacies*. Third Edition. Maidenhead: Open University Press.
- Lenhart, A., Purcell, K., Smith & Zickuhr, K. (2010). *Social media and mobile internet use among teens and young adults*. PewInternet: Washington, DC. Retrieved from <http://pewinternet.org> (10 January, 2012).

- Liu, C.-C., Liu, K.-P., Chen, W.-H., Lin, C.-P. & Chen, G.-D. (2011). Collaborative storytelling experiences in social media: Influence of peer-assistance mechanisms. *Computers & Education*, 57 (2): 1544-1556.
- Livingstone, S. & Brake, D. (2010). On the rapid rise of social networking sites: New findings and policy implications. *Children and Society*, 24: 75-83.
- Livingstone, S. & Haddon, L. (2009). *EU kids online: Final report*. LSE, London: EU kids online. Retrieved from <http://www2.lse.ac.uk> (23 July, 2010).
- Luckin, R., Logan, K., Clark, W., Graber, R., Oliver, M. & Mee, A. (2008) *Learners' use of Web 2.0 technologies in and out of school in Key Stages 3 and 4*. Coventry: Becta.
- Luckin, R., Clark, W., Graber, R., Logan, K., Mee, A., Oliver, M. (2009). Do Web 2.0 tools really open the door to learning? Practices, perceptions and profiles of 11-16-year-old students. *Learning, Media and Technology*, 34 (2): pp. 87-104.
- Lund, A. (2008). Wikis: A collective approach to language production. *ReCALL*, 20 (1): 35-54.
- Maher, D. (2009). The importance of elementary school students' social chat online: Reconceptualising the curriculum. *Computers & Education*, 53: 511-516.
- Maher, D. (2010). Supporting students' transition from primary school to high school using the Internet as a communication tool. *Technology, Pedagogy and Education*, 19 (1): 17-30.
- Mak, B. & Coniam, D. (2008). Using wikis to enhance and develop writing skills among secondary school students in Hong Kong. *System*, 437-455.
- Marttunen, M. & Laurinen, L. (2007). Collaborative learning through chat discussions and argument diagrams in secondary school. *Journal of Research on Technology in Education*, 40 (1): 109-126.
- Minocha, S. (2009). Role of social software tools in education: A literature review. *Education & Training*, 51 (5-6): 353-369.
- Owen, M., Grant, L., Sayers, S. & Facer, K. (2006). *Social software and learning*. Bristol: Futurelab.
- Pifarre, M. & Fisher, R. (2011). Breaking up the writing process: how wikis can support understanding the composition and revision strategies of young writers. *Language and Education*, 25 (5): 451-466.
- Richardson, W. (2006). *Blogs, wikis, podcasts and other powerful web tools for classrooms*. London: Sage Publications Ltd.
- Scardamalia, M. & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In R. K. Sawyer (Ed.) *Cambridge handbook of the learning sciences*. (pp. 97-118). New York, NY: Cambridge University Press.
- Sweeney, T. & Geer, R. (2010). Students' use of ICT in the early years. In D. Gron & G. Romeo (Eds) *ACEC2010: Digital diversity*. Conference Proceedings of the Australian Computers in Education Conference 2010, Melbourne 6-9 April, Carlton, Vic: Australian Council for Computers in Education (ACEC). Retrieved from <http://acec2010.acce.edu.au>.
- Tan, J. (2009). *Digital kids, analogue students : a mixed methods study of students' engagement with a school-based Web 2.0 learning innovation*. PhD thesis, Queensland University of Technology.
- Valk, A., Atticks, A., Binning, R., Manekin, E., Schiff, A., Shibata, R. & Townes, M. (2011). Engaging communities and classrooms: Lessons from the Fox Point oral history project. *Oral History Review*, 38 (1), pp. 136-157.
- Van den Beemt, A., Akkerman, S. & Simons, P. (2010). Pathways in interactive media practices among youths. *Learning, Media and Technology*, 35 (4): 419-434.



- Van den Beemt, A., Akkerman, S. & Simons, P. (2011). Patterns of interactive media use among contemporary youth. *Journal of Computer Assisted Learning*, 27: 103-118.
- Wishart, J. & Triggs, P. (2010). Museum Scouts: Exploring how schools, museums and interactive technologies can work together to support learning. *Computers & Education*, 54: 669-678.
- Wong, R. & Hew, K. (2010). The impact of blogging and scaffolding on primary school pupils' narrative writing: A case study. *International Journal of Web-based Learning and Teaching Technologies*, 5, 2, 1-17.
- Zhang, J., Hong, H. Y., Scardamalia, M., Teo, C. L., & Morley, E. A. (2011). Sustaining knowledge building as a principle-based innovation at an elementary school. *The Journal of the Learning Sciences*, 20(2), 262-307.
- Zhang, J., Scardamalia, M., Lamon, M., Messina, R. & Reeve, R. (2007). Socio-cognitive dynamics of knowledge building in the work of 9- and 10-year-olds. *Education Technology Research and Development*, 55: 117-145.
- Zywica, J., Richards, K. & Gomez, K. (2011). Affordances of a scaffolded-social learning network, *On the Horizon*, 19 (1): 33-42.