Preparing schools to accommodate the challenge of Web 2.0 technologies

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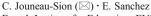**Abstract** With laptops, mobile phones, tablets and broadband wireless access becoming more widely available, Web 2.0 is now entering schools. This changes the way students work and communicate, altering their relationship with knowledge, and generating new objectives for media literacy in the digital society. Thus, schools face new challenges and this paper aims at highlighting four of them. A first challenge relates to trust. Web 2.0 opens the classroom to the world and educators have to face new dangers and irrelevant uses, while bringing their students to gain better access to information and culture. The second challenge relates to teachers' professional identities. The role of teachers is changing as Web 2.0 tools are being used by students, and policymakers should take this into account. A third challenge relates to a growing need to control working time, timetable organization and rhythm in schools. The fourth challenge that we underline is the need for common rules that allow students to benefit from the opportunities offered by Web 2.0 to develop their autonomy and to foster ethical practices.

Keywords Web 2.0 · Participatory culture · Challenges · Teachers' professional identity · Future of education

1 Introduction

Web 2.0 is now entering schools. More and more teachers allow their students to use *Facebook* to carry out collaborative work or to stay connected as "friends", to get information from *Wikipedia* during school time, to display school projects on weblogs and to communicate with *Twitter*. As Web 2.0 applications allow users to do more than just retrieve information, they meet the need schools have for a digital participatory culture in the 21th century (Jenkins et al. 2006). However, letting

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students use social networks at school or to freely access and display information can be a source of problems for teachers. How can educators deal with the use of a participatory web, interactive content and virtual communities? What questions should be addressed to face the reality of a digital society?

Schools now have to face new challenges. This paper aims at highlighting four of the challenges and proposes some orientations for the future of education.

2 First challenge: Trust!

Web 2.0 offers the opportunity to open classrooms to the world by allowing students to get real-time information and to find instant answers to most of the questions that can be addressed by a teacher. Moreover, Web 2.0 is a way to produce and to display information; for example, by using *Twitter* to interview a personality, by publishing the interview with *Facebook*, by writing a post for a weblog or by participating to the writing of a *Wikipedia* article. However, digital and social media sometimes lead to irrelevant or unacceptable uses such as video-taping teachers or classmates and publishing the video on *Youtube*, texting with a cellphone during school time, cheating or plagiarism. Educators have to face the challenge of being able to control bad practices without preventing useful learning uses. They need to manage to keep students' attention and to protect them from bad content. Many schools try to solve the problems caused by Web 2.0 technologies with injunctions, filters and blacklists. But these protections are easily bypassed by students with proxies and 3 G networks and educators have to run an endless race with newly released technologies.

However, some teachers have started to think differently and to experiment with another way of dealing with these problems. For example, in a primary school in the north of France,[1] the pupils (6–7 years old) of J.R. Masson's class microblog with *Twitter*. They write the news of the day in 140 characters; they play chess with another "twitter-class", solve a riddle sent by a *Twitter* follower and try to answer philosophical questions.

This alternative approach is based on trust. The teacher has to trust in his pupils and accept that they are free to decide whether the content of their microblogging is relevant or not, whilst parents must trust the teacher because *Twitter* links pupils to unknown adults. Dealing with this risk is quite similar to that of other social spaces. Firstly, educators must discuss with students the rules that they want to apply. These rules have to be clear enough to be understood by all (i.e., both students themselves and their parents). Secondly, these rules have to be flexible enough to accommodate usual teaching practices, especially concerning Internet access and web publication.

Therefore, it is important to foster the digital media literacy of parents, children and educators. One challenge to face is managing to open a safe-zone where everybody shares common deontic norms.

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[1] http://twitter.com/classe_masson

3 Second challenge: The teacher's professional identity

As digital and social networks allow one to ask questions and get answers without delay, the relationship of students with knowledge is now changing. Web 2.0 technologies allow youths to participate in networks and to share knowledge and "expertise", while new media are altering how youths learn and socialize (Ito et al. 2008; Lenhart et al. 2008). In this context, students are not necessarily ready to continue accepting a school model based on a pyramidal organization where knowledge comes from experts. Thus, a growing gap separates youth digital culture from the mainly academic school culture (Bonfils 2007). This raises the question of teacher identity in the 21st century.

When teenagers play online multiplayer games, or when they share and remix web content, they collaborate to reach a common objective. Web 2.0 is fundamentally interactive and collaborative. As a result, Web 2.0 can foster team-work skills. Moreover, collaborative skills are essential to living in the digital world and to dealing with the ever-complex problems faced by modern societies. Schools should thus prepare students for collaborative team-work and there are many ways to do so. For example, teachers can organize collaborative writing with *Etherpad* (a collaborative text editing web app), ask students to prepare a joint project with a wiki or to share documents with *Dropbox* (a shared online folder), *Google Docs* or one of the numerous tools available online for free

Despite the availability of information, students need to be able to evaluate the reliability of the answers that they get from the Internet. Of course, books, lectures and lessons have always contained errors but, for most people, it is difficult to spot them. Within the digital society, students can easily have access to different historical or scientific interpretations, thus bringing them to question the models conveyed in the classroom. They can identify multiple opinions and contradictions, but they don't necessarily have the key to deciding whether a piece of information is relevant.

> By its nature, the Internet rewards critically comparing multiple sources of information, individually incomplete, and collectively inconsistent. This predicament encourages learning based on seeking, selecting, and synthesizing, rather than on assimilating a single validated source of knowledge as from books, television, or a professor's lectures (Dieterle et al. 2007 p 40).

The effects of these changes on the teacher's professional identity are very important. Teaching thus becomes less about providing relevant information and more about helping students retrieve, shape and assess information by themselves. Starting from this, what does it mean to be a 21st century teacher?

4 What is a 21st century teacher?

There is a need for the renewal of pedagogy. Chalk and talk do not fit the expectations of the students anymore. The teacher now has to accompany his or her students in their learning process, to teach them how to handle information, to criticize it, to shape it and to communicate it, without being reduced to being a tutor who executes technical tasks to develop the skills of the students. As an engineer, the teacher is responsible for designing complex learning situations that permit the students to choose their own strategy for learning. The teacher must therefore master the core

concepts of his/her discipline and design motivating projects that lead students to using the concepts that they have to learn and to helping students develop relevant skills. The teacher also has to help the students to find answers by themselves and be able to assess the different strategies followed by the students and provide feedback. Furthermore, the teacher still has to encourage them and is responsible for equity and ethics in the classroom. The teacher is still the expert in his field of knowledge and has a crucial role in helping the students become aware of the implicit knowledge that they use to solve a specific problem by making the learning explicit and, therefore, making its transfer to other contexts possible. The teacher has to permit the students to take initiative and thusface unexpected situations. In this way, the role of teachers becomes more and more complex and multifaceted. As a result, teacher training is crucial to help them to be prepared for the complexity of the task.

5 Third challenge: Keeping the control of the timetable

Web 2.0 also changes the relationship with time as teachers and students can stay connected after school via emails, weblogs, *Twitter* or *Facebook*. As it has been argued that permitting school staff to interact with students increases the risk of sexual misconduct, some school boards are drafting policies that dictate how school staff can interact with students via new networks and technologies. For example, teachers and other employees from the state of Virginia[2] are not allowed "to use personal wireless communications devices to "text" students and are prohibited from interacting one-on-one with students through personal online social-networking sites. However, more and more teachers accept that to stay connected with students via emails or online platforms, the border between private time and professional time that has always been blurry for teachers is now disappearing. The increasing time devoted to online students' coaching after school time has to be taken into account. One can wonder if the use of Web 2.0 tools to text messages to parents, to coach students via *Skype*, *MSN* or *Moodle* or to comment on students' blog entries should now be considered a part of the teacher's work. Educational institutions try to encourage the use of ICT by improving infrastructures and enabling access to teaching and learning resources, but much more attention should be paid to account for the meaning of the use of ICT in terms of the professional identity of teachers.

In addition, the school timetable is still based on a model designed for mono-disciplinary content and individual learning. As this model is now changing, the timetable has to be changed too. Web 2.0 tools allow students to perform complex activities that encompass both individual (i.e., seeking, selecting, and synthesizing information) and collective (i.e., cooperation, collaboration) tasks. Pedagogies based on a competency approach, such as Project-Based Learning, that bring the student to perform complex tasks (thus developing autonomy and high-level skills) take time. In previous work related to a pretend game dedicated to land-use management and sustainable development, we described how students had to mobilize geography and science concepts, communicated with experts and local authorities, carried out

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[2] Virginia poised to ban student – teachers texting and Facebooking, January 9, 2011, http://www.readwriteweb.com/archives/virginia_poised_to_ban_teacher-student_texting_fac.php

fieldwork to get real data, used a Geographical Information System to process this data and prepared a video to communicate their findings. Such projects do not fit the official curriculum and schools timetables need reorganization to encourage this kind of collaborative learning.

On the other hand, Web 2.0 tools permit short school activities. Indeed, students benefit from instant access to information and an easy way to communicate. For example, in 45 min, secondary students can compare the same information (about the political changes in Egypt, for example) displayed by *Twitter*, TV and newspaper websites. A primary student needs less than 10 min to text a short message in a foreign language to the whole class. Due to the diversity of school activities permitted by Web 2.0 tools, schools need tailored and flexible timetables suited to learning situations based on social network use. Already, some schools have decided to shift to a Web 2.0 timetable. For example, in the *School of the Future* of Philadelphia, the teachers choose the classroom timetable every 3 months. Each period is devoted to a theme. The students are encouraged to use a multidisciplinary approach as each theme is studied during science, history, geography, literature or philosophy courses. Moreover, students are involved in various classroom settings. Sometimes a single teacher gives a one-hour course, sometimes students are involved in team-work with two teachers during 2 or 3 h and sometimes each class of students can be divided into two or three groups where students are involved in different activities according to their individual needs. This organization has an impact on the work of teachers, as they are expected to be available during the whole week, to be flexible and to accept to work together.

Moreover, time is also a matter of rhythm and delay in which everybody is concerned. What is the acceptable delay a student can wait when asking a question to the teacher? How many times a day is a teacher supposed to check emails? Every business day? Twice a day? Due to the possibility of establishing new relationships with students and families, many teachers are frightened of losing control of their agenda. This stems mostly from the fact that the rules to communicate with Web 2.0 tools are not clear enough; new norms and standards of communication have to be settled.

6 Fourth challenge: Ethics

As Web 2.0 tools are designed for user-centeredness, usually available for free and easy use, teachers are tempted to register their students without asking their permission. Nevertheless, it is important to take into account the ethical dimension of leaving personal data on the Internet. Firstly, personal data is recorded by private companies that are mostly motivated by business rather than education. This data encompasses at least names and email address, often sex, date of birth and students interests. Secondly, resources produced by students can be stored for a long time on a website and can participate in shaping their digital identity. For example, files are stored on *Google Docs* services and articles published by students remain on *Facebook* or weblogs. Few teachers read the General Conditions of Use of websites or consider children's copyrights. Indeed, students are considered the authors of the resources they produce and their work cannot be published without their authorization. As a result, teachers ought to choose tools that respect the rights of users, by ensuring

that data will not be used for commercial purposes and do not expose the children to advertisement. That is why, in some countries and especially in France, educational boards prefer to develop specific tools designed for educational purposes. *Environnements Numériques de Travail*[3] (Digital Working Platforms) are such tools that permit both to share, communicate and store data within the school community. Those tools are secured by logins and passwords and access is limited to the school community members. However, one can argue that offering students a secured space is not the right way to prepare them to facing the wild Web 2.0 era. Moreover, if a school is considered as an isolated world, students cannot benefit from authentic experiences and cannot develop relationships with experts or peers from other schools.

7 Conclusion

A recent report from the European commission underlines that "Educational systems should…… take into account the fact that new technologies can create an empowerment culture, which puts the learner at the centre of the learning process. Otherwise, there is the risk that education policies and systems become irrelevant for students' real and future needs" (Cachia et al. 2010 p iv). Nevertheless, integrating the participative Internet into school is a great challenge as there is a need for radical changes in terms of the professional identity of teachers, school organization, new rules and new relationships in school. These changes cannot result from dogmatic innovation (i.e. a rigid top-down process which aims at encouraging teachers to introduce new technologies into their practices). These changes will result from a participatory process in which educators, students and their parents will engage. Therefore, it will be possible to imagine the future of education for 21st century citizens.

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[3] As an example, Lilie is one of what is called ENT in France http://lilie.iledefrance.fr