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Web 2.0: Inherent tensions and evident challenges for education

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Abstract In upper tertiary educational programmes around the world, the new Web-mediated communication practices termed Web 2.0 are introduced as learning activities with the goal of facilitating learning through collaborative knowledge construction. The aim of this paper is to point to discrepancies in the views of learning, knowledge, and the goals of the practice implicit in Web 2.0 and educational practices and to argue that these discrepancies lead to theoretical tensions and practical challenges when Web 2.0 practices are utilized for educational purposes. The article is structured into four main parts: First, Web 2.0 is characterized from a practice perspective. Second, some conceptual discrepancies between the "practice logics" of Web 2.0 and educational practices are identified. Third, the question of transcending the discrepancies is raised through a discussion of related pedagogical strategies. Fourth, it is argued that the conceptual discrepancies bear out in practice as concrete challenges concerning collaboration, evaluation, and the general aim and status of the material produced by students. These challenges are illustrated with examples from the author's practical experience with Web 2.0-mediated learning activities in eight courses at the BA and MA levels.

Keywords Web 2.0 in education · Concepts of knowledge · Concepts of learning · Practice logic · Body schema · Evaluation

Introduction

Communication on the World Wide Web (WWW) is currently evolving from the one-to-many display of information on homepages to the "bottom-up" many-with-many

An earlier and much shorter version of this article was presented as a paper at the 6th International Conference on Networked Learning, Halkidiki, Greece, May 5th–6th, cf. Dohn (2008).

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interaction of numerous participants in the construction of social networks, communities of practice, user-driven encyclopaedias like Wikipedia (http://www.wikipedia.org/), and collaborative content sharing systems like Connexions (http://cnx.rice.edu/). This shift in the role of the WWW, and of communication on it, is characterized as the shift from Web 1.0 to Web 2.0 (Downes 2005; O'Reilly 2005), and, correspondingly, the technological tools that enable the shift are designated Web 2.0 technologies. Likewise, the new communication practices can be termed Web 2.0 practices. Closely linked to the development of such Web 2.0 communication practices, requisite to it as well as supported by it, is a change of attitude toward issues such as authorship, copyright, knowledge production, and expertise: To the extent that Wikipedia does display expertise, this expertise can be seen as a kind of "wisdom of crowds" (cf. Surowiecki 2004), enabled by the distributed authorship, the renouncement of copyright, and the acceptance of one's text being edited and transformed by later coauthors. Similarly, at least for some of the communication practices (e.g., many personal blogs, "friendships sites" like MySpace and Facebook, and 3D-worlds such as Second Life), there is a shift in the goal of the communication from centring on information sharing to focusing on the establishment and negotiation of personal identity and social relations and, generally, on participation for the sake of participation itself.

In upper tertiary educational programmes around the world[1], Web 2.0 technologies and practices are being introduced into the teaching and learning activities. The reasons for doing so are many[2]: For one thing, employing in the service of learning some of the communication practices that young people are already using voluntarily in their spare time arguably will help them enter the learning practices of the university, both in respect of their motivation and of the skills required of them. Related to this, for another, in both a lifelong and life-wide perspective (Jarvis 2007), the user-centred focus of Web 2.0 activities supports the learner in transgressing and resituating content and practices between the formal and informal learning settings in which s/he participates. An important third reason is the didactic potential of Web 2.0: The centrality of participation, production, dialogue, and collaboration in Web 2.0 practices seemingly make them ideal as elements in programmes focusing on the learner's active engagement, individually and/or collaboratively, as a prerequisite for learning. From yet a fourth point of view, many of the possible future jobs of the students will require competence in the use of Web 2.0—for example, skills in navigation, communication, and critical evaluation—and, therefore, a new task of educational programmes is to support the acquisition of such competences along with other subject-related competences.

However, introducing Web 2.0 practices into learning activities in an educational setting in many cases leads to challenges in practice. The aim of this paper is to argue that these challenges are the result of conceptual tensions in the views of knowledge, learning, and the goals of the practice implicit in Web 2.0 practices on the one hand, and the educational system on the other. This will be done through, first, a section which gives a characterization of Web 2.0 from a "practice perspective"; second, a section which pinpoints basic aspects of the "practice logics" of Web 2.0 and educational practices; third, a section which discusses the possibilities of transcending the tensions; and fourth, a section

[1] Examples include the Georgia Institute of Technology, USA (Rick and Guzdial 2006), the Open University, Great Britain (Jones 2008), the University of Birmingham, Great Britain (Pilkington et al. 2007), Queensland University of Technology, Australia (Bruns and Humphreys 2005), and University of Southern Denmark where the author of this article teaches.

[2] For elaborations of arguments along the following lines compare, for example, Cress and Kimmerle 2008; Rick and Guzdial 2006; Yukawa 2006; Bruns and Humphreys 2005; Boulos et al., 2006; Lund and Smørdal 2006; Dalsgaard 2006; Fountain 2005; Otnes 2002.

which looks more specifically at the practical challenges which arise when the former is introduced into the latter. These challenges are illustrated with examples from courses taught by the author.

A practice perspective on Web 2.0

Characterizing Web 2.0 from a practice perspective

In the literature on Web 2.0, there is quite a lot of hype about the potential of the phenomenon for liberating ideas, connecting people, producing and sharing innovative knowledge, and changing our lives and identities—expressed in video-form by M. Wesch (2007) and illustrated by enthusiastic proclamations such as "the emergence of the Web 2.0 is not a technological revolution, it is a social revolution" (Downes 2005, section 3) and Web 2.0 is a "participatory platform… a means whereby just about anyone can contribute to an ongoing 'conversation' in which knowledge is both discovered and constructed" (Freedman 2006, p. 13). There is, however, rather little agreement on more specific characterizations of what Web 2.0 actually is.

In this article, "Web 2.0" is viewed from a practice perspective, as a name for *certain forms of activities or practices*. It is, thus, not seen as referring primarily or even essentially to a particular set of technologies, but instead as denoting certain types of *use* of (in principle any kind of) Web-mediated technology. From this practice point of view, "Web 2.0" denotes activities characterized by most or all of the following:

- collaboration and/or distributed authorship
- active, open-access, "bottom-up" participation and interactive multi-way communication
- continuous production, reproduction, and transformation of material in use and reuse across contexts
- openness of content, renunciation of copyright, distributed ownership
- lack of finality, "awareness-in-practice" of the "open-endedness" of the activity
- taking place on the WWW, or to a large extent utilising Web-mediated resources and activities

"Being 'Web 2.0,'" it should be stressed, is not a binary function, but rather a question of degree. For example, an activity may be collaborative to a high degree, but maintain the requirement of individual authorship/traceability and/or demand expert approval of "bottom-up" contributions. The content sharing system Connexions, mentioned above, is an example of a Web 2.0 project which upholds the first of these requirements, and the online encyclopaedia Citizendium (http://en.citizendium.org/) is an example of a project which upholds both. The list of characteristics, therefore, does not designate a set of individually necessary, jointly sufficient, conditions for an activity to be defined as "Web 2.0." Rather, it points to aspects which can be ascribed to paradigm cases of Web 2.0, such as the activities that take place on, with, and through Wikipedia, Flickr, and Facebook. Concrete activities may possess some or all of the aspects, and, for each of them, possess it to a greater or lesser extent. "Being 'Web 2.0'" is a question of degree—of showing more or less family resemblance (Wittgenstein 1984) with the paradigm cases.

The last aspect, however, is somewhat special in this respect. Unlike the other characteristics, this one *is* a necessary condition for an activity to be Web 2.0 because the very point of the term "Web" is the implication that activities so designated in significant

ways involve the WWW. Importantly, though, the term is not restricted to activities taking place solely within an online environment. Such a restriction would seem an artificial constraint: For one thing, it would be in opposition to the other characteristic aspects mentioned of open-endedness and use/reuse of material across contexts. For another thing, it would seem to indicate a partitioning in the lives and practices of people engaging with Web 2.0 between activities taking place in virtual and in physical settings. In actual fact, of course, such activities often cut across online and "real-life" environments, for example, when friends from physical settings pick up on their face-to-face conversation on Facebook after coming home, further develop it, and then carry on where they left on Facebook the next time they meet in person. An empirical investigation of friendship and communication patterns on Arto (a Danish social site more or less equivalent to Facebook, except that it is almost exclusively used by teenagers) shows that this is, in fact, how Arto is integrated into the communicative practices of its users (Larsen 2007).

Arguing for the practice perspective

The practice perspective on Web 2.0 advocated in this article is motivated by several considerations: Firstly, characterizations of Web 2.0 focusing on the technological side actually also tend to stress the changed practice (i.e., of participation and involvement) that the technology enables for the "end user" or community of "end users."[3] In line with this, secondly, it is hard to see how it could be otherwise because the point of technology is not the technology in itself, but the use to which it can be put. Thirdly, even comments such as those made by the inventor of WWW, Berners-Lee, which seemingly contradict the very idea of "Web 2.0," actually underscore the reasonableness of the practice perspective: "Web 2.0 is … a piece of jargon, nobody even knows what it means" since "… the idea of the Web as interaction between people is really what the Web is. That was what it was designed to be as a collaborative space where people can interact" (developerWorks Interviews 2006). If one accepts Berners-Lee's claim that "Web 2.0" takes place using "Web 1.0" technology (ibid.), and that the design vision of WWW has been the facilitation of collaboration and interaction all along, but one still wants to maintain that something *has* changed over the last few years; the only possibility left is that what has changed is the practices of the people utilizing the WWW. Fourthly, and most relevant in this context, the practice perspective is of interest to educational theory because it enables one to focus on the challenges and possibilities which Web 2.0 presents to the educational system. I shall return to this point shortly.

Theoretically, underpinning these considerations, the practice perspective is backed by a view inspired by phenomenology (Merleau-Ponty 1962; Bourdieu 2000; Dohn 2009) and activity theory (Vygotsky 1978; Cole 1996; Wertsch 1998; Säljö 2000) that the relationship between technology, attitude, and practice is a dialectical one and, therefore, is somewhat more complicated than the Berners-Lee citation might indicate: Technology is developed out of, and in relation to, certain human practices. This means that human inventiveness in concrete instances may give form to the use of technology, but that the affordances of technology on their side give form to the activities that humans can undertake and the inventiveness that they can show. "Affordances" of objects, importantly, are here not essentialist features posing hypothetical "action possibilities" for agents, irrespectively of

[3] Compare, for example, the description of Web 2.0 from Gutmans, cofounder of the PHP-development company Zend (Gutmans 2006), and the rules for businesses concerning application development proposed by O'Reilly (2006).

their actual skills. Rather, they are relational traits, dependent on what *actual* action possibilities *actual* agents have with them, given the physiologically, personally, and culturally dependent skills *of* these agents (Gibson 1986; Dohn 2009). This relational ontology of affordances is a further articulation at the individual level of the dialectic nature of the relationship between technology and practice.

The point here as regards Web 2.0 is that Web 2.0 practices have not arisen suddenly, because the technology was there (as the technological viewpoint of e.g., Gutmans 2006, and O'Reilly 2006, might seem to imply), nor was the technology designed in total abstraction from what people did already (as the Berners-Lee citation could lead one to think). No matter how innovative design visions are, they are rooted in, and relate to, existing practices and their shortcomings, seeking to widen, transcend, or transform these practices. Very seldom—if ever—do design visions correspond exactly to the practices that develop *with* the technology once it is implemented: The set of affordances that the technology actually turns out to have when situated in concrete practical settings with established ways of doing things is nearly always more complex than can be foreseen in advance. This is not least because people do unexpected things, on purpose or by accident, and in so doing codevelop skills and uses of the technology not anticipated on beforehand. Therefore, the technology supporting Web 2.0 is better seen as having been developed in relation to beginning practices, the contours of which were still unclear, in response to the problems and possibilities perceived in these beginning practices. Reciprocally, the further evolvement of the Web 2.0 practices was then made possible by the technologies so developed.

Implications for educational theory

There are at least two ways in which this perspective helps to focus discussions of the challenges and possibilities for education posed by Web 2.0. The first is by pinpointing that it is a prerequisite for realizing the possibilities of Web 2.0 in education that one concentrates on the *use* of tools and on the related question of reciprocity of skill and affordance, but not on the tools and their alleged possibilities "in and of themselves." The second is by highlighting the more general question of intrinsic coherence (or lack of it) between conceptions of knowledge and learning inherent in Web 2.0 practices and in educational ones. Here, the practice perspective leads to a focus on the theoretical and practical consequences which a lack of coherence may have due to individual and institutional incorporation of the divergent conceptions. This will be the focus of the next sections.

Dealing first with the question of tool versus use of tool, the practice perspective stresses that integrating Web 2.0 in education is primarily a matter of integrating certain *practices*, more specifically practices characterized to some extent by the presence of the aspects mentioned above. Now, because practices are dialectically bound to both tools and the attitudes and skills of agents, not "any old tool" will do, but neither will there be "the one and only tool" which ensures a given form of practice. Far from it, the tool by itself, narrowly viewed, is *relatively* unimportant; it is the skill-relative affordance it poses for the agents in a given context which matters. Or better, acknowledging that skills may develop, the skill-relative affordance it may come to pose in the given context is what matters. Only it should be noted, again, that skills and affordances do not develop out of the blue, but dependently on the skills which the agent already has, on the practices in which s/he is already engaged, and on the understandings hereof which s/he implicitly or explicitly endorses. So "which skill-relative affordance a tool may come to pose" is dependent on the

"historical body" (Scollon and Scollon 2004) of the agent; that is, on the ways of acting incorporated into his/her body schema as Merleau-Ponty would say, stressing the individualistic aspect (Merleau-Ponty 1962, cf. Dohn 2009), or, at a more sociocultural level, on the "habitus" which s/he has incorporated (Bourdieu 1977, 1980, 2000).

More specifically, on the one hand, this means that utilizing Web 2.0 in educational practice does not hinge on implementing certain specific kinds of technology. It may, in many contexts, be advantageous to use existing technologies, with which students and teachers are already familiar. This way, one seeks to build on the affordances, which the technologies already present to the agents with the aim of extending and revising current uses to become more Web 2.0. Given that "being Web 2.0" is not a binary attribute, this is a reasonable strategy. It does hold the obvious risk, though, that activities involving the known technologies are so well established that real enacted changes (as opposed to merely verbally expressed ones) can be very difficult to bring about. In the courses in which the author adopted this strategy (two BA and two MA courses), she and her students experienced both the advantages in the form of initial ease of use and of "single platform" convenience *and* the subsequent difficulty of transcending incorporated ways of acting to effect real changes. Less anecdotally, Dirckinck-Holmfeld et al. (2009) argue that certain teaching and learning practices within the field of networked learning have incorporated Web 2.0 ways of acting for a number of years prior to the adoption of the technological tools normally associated with the term.

On the other hand, from the practice perspective, the fact that one uses certain technologies, for example, wikis, blogs, tagging, and so forth, in one's teaching does not in itself make the resulting educational practice "Web 2.0": A teacher might choose to use a wiki as a one-directional information delivery system, producing all the entries him-/herself, and thereby supply a traditional expert-written online encyclopaedia for the course. This would be in line with *some* of the suggested uses of wikis and blogs found in Duffy and Bruns (2006) and Parker and Chao (2007), who note that syllabus, handouts, and presentations can be made accessible by the teacher on a wiki or blog site. The rationale of such uses seems primarily to be the possibility of easy dissemination of information via the new technologies and only secondarily the potentiality for student involvement through, for example, comments and edits to the material published by the teacher. Though such uses may conceivably be reasonable in some contexts, they bear too little family resemblance with paradigm Web 2.0 cases to be examples of Web 2.0 educational activities.

Similarly, Land and Bayne (2008) report on a course, in which blogs were used as private virtual rooms for student reflection and assessment, each blog being open only to one student and his/her tutor. When interviewed by Land and Bayne about this use, one of the tutors stressed the benefits for the students of having a "safe space" and of getting personal support and feedback. However, s/he—consistent with the view taken here—expressed doubts about whether "what we are doing in the weblog is a Web 2.0-type use of blogs…" because the students do not engage in "collaborative knowledge construction" (Land and Bayne 2008, p. 679). In terms of family resemblance with paradigmatic Web 2.0 cases, this practice shows only a few of the characteristic aspects, namely those of active "bottom-up" participation taking place on the WWW (but the participation is not open access, and the interactive communication is only two-way) and, therefore, is only Web 2.0 to a very limited degree, if at all.

As a last example, the use of podcasts may be mentioned: Though podcasts are sometimes characterized along with wikis and blogs as a Web 2.0 communication possibility (e.g., Boulos et al. 2006), from the point of view of the practice perspective, there is very little Web 2.0 in the one-way content delivery of teacher-produced lectures or

course material, no matter what degree of flexibility it gives the student with respect to the specific time at which s/he wishes to "attend" the lecture or material. Evaluating by the list of characteristics given above, uses of podcasts will only be Web 2.0 to a significant degree, if learning activities are constructed which centre, not on the teacher-produced podcasts themselves, but on bottom-up, participatory, collaborative student activities *with* such podcasts. That is, when the podcasts, together with other virtual and physical material, have the status of resource and starting point for the collaborative production of material by the students—or, alternatively, when the students themselves, not the teacher, are the ones who produce the podcasts.

Conceptual discrepancies between Web 2.0 and educational practices

The second major issue concerns the differences in what one with inspiration from Bourdieu might call the "practice logics" and "habituses" of Web 2.0 and educational practices (Bourdieu 1977, 1980, 2000). Within this overall problem field, the focus here will be on the tensions between, one, the *goals* of the practices and, two, the *conceptions of knowledge and learning* implicit in them.

Regarding the first, an important difference between Web 2.0 practices and educational ones lies in the internality versus the externality of their basic goals: Fundamentally, the Web 2.0 practices of the WWW have internal goals, that is, they aim at the participation, communication, knowledge construction, and knowledge sharing *of* these practices themselves. They do not intrinsically aim at fulfilling goals outside of themselves. Educational practices in contrast do: The most basic, underlying rationale of organizing learning into specific (virtual or physical) institutional practices—schools—distinct from the ones in which the learner is later to participate—"working life practices"—is that the learner should participate in the former *in order to* afterwards be able to participate in the latter. Putting the difference between the goals of Web 2.0 and educational practices too bluntly, participation in Web 2.0 practices is for the sake of qualifying the participation *in* them, whereas participation in educational practices is for the sake of qualifying to *get out of* them.[4]

This fundamental difference indicates a further, very important discrepancy concerning the views of knowledge, competence, and learning appertaining to the practices. This discrepancy can be brought out through the analysis of Sfard (1998) which constitutes a very enlightening presentation of contemporary educational research as caught between two metaphors for learning, namely the acquisition and the participation metaphor. In Sfard's article, however, the two views are presented as metaphorical frameworks (Lakoff and Johnson 1980) with which one, in principle, can regard any learning practice. In contrast, the argument in this article is that educational practices intrinsically build upon the acquisition metaphor, whereas Web 2.0 practices incorporate the participation metaphor to a very high degree. Thus, the question of a possible reconciliation between the metaphors is

[4] This way of putting it is too blunt for at least two reasons. Firstly, actual participants may have other supplementary or even primary goals for their participation in both kinds of practices. Secondly, over the last decades many educational activities other than Web 2.0-based ones have been designed which aim at transcending the clear-cut distinction between school practices and working life practices. Examples are activities involving problem-based learning, problem-oriented project pedagogy, or portfolio. The nuances—and tensions—which such "transcending activities" lead to will be discussed later. The point here is to draw attention to fundamental differences in the practice logics of the involved practices to set the analytical stage *for* such a discussion.

not just the theoretical one of upholding two divergent perspectives, but the very practical one of bridging or integrating practices.

The fundamental acquisition metaphor of educational practices

The claim that educational practices intrinsically build on the acquisitionist metaphor hinges on the externality of the goals of educational practice: Implicit in the underlying rationale of separating learning practices from working life practices is the idea that the learner, by participating in the former will *change* in ways that will enable him/her later on to participate more competently in the latter. This change, more specifically, necessarily must consist in the acquisition of "something" which can be transferred to other contexts without major loss. Precisely what the "something" to be acquired is, may be up for debate. Mental entities, cognitive states, "objective knowledge" are obvious candidates, but, importantly, so also are abilities and dispositions to act. If these were not to some extent thought of as "transferrable somethings," it would not be consistent for learning activities separated from working life to aim at them. Moreover, the "somethings" necessarily have to be acquired and possessed individually: Students nearly always make the transition from educational to working life practices singly so whatever is to be transferred between the former and the latter must be "brought across" by the student him-/herself. Collaboration can at most be a means of acquiring individual knowledge and skills; including "collaborative skills," individually construed. Summing up, inherent in educational practices, therefore, is an individualistic, objectivistic view of knowledge and competence (or at least of essential constituents hereof). Learning, correspondingly, is viewed as the acquisition—the coming into possession—of the knowledge and competence states and abilities, objectivisticly understood.

Following Sfard (1998), it should be noted that the acquisitionist metaphor forms a common base to pedagogical approaches and practices that differ substantially as regards views on *in what* the "objects" to be acquired more specifically consist and *how* they are to be acquired. Exemplifying with approaches and literature within the field of computer-assisted learning, answers to the questions of "what" and "how" range from the behaviouristic "transfer" of propositional behaviour from teacher or computer to student through reinforcement (Skinner 1968; Bostow et al. 1995), over Piagetian- and Luhmann-inspired individual construction of mental representations and schematas (Piaget, 1950) or of inner complexity of the cognitive system (Luhmann 1984; Cress and Kimmerle 2008), perhaps mediated through cognitive confrontation and argumentation with other learners (Weinberger et al. 2005; Jermann and Dillenbourg 2003; Dillenbourg and Tchounikine 2007; Andriessen et al. 2003) to Vygotskian-inspired internalization/appropriation of socially mediated knowledge (Vygotsky 1978; Wegerif and Dawes 2004). Important differences exist between these approaches, not least concerning the questions of whether what is to be acquired has prior existence, can be specified exhaustively on beforehand, or comes into being in the process. These differences, however, show up on the background of a basic agreement on an objectivistic ontology of the *results* of learning.

The fundamental participationist metaphor of Web 2.0 practices

In contradistinction hereto, learning within Web 2.0 practices is implicitly and explicitly (Downes 2005) viewed as participation; knowledge and competence are correspondingly viewed as situated doing. This claim is motivated by noting the near-equivalence between the paradigmatic characteristics of Web 2.0 outlined above and the concept of learning

presented by Wenger (1998) who together with Lave (Lave and Wenger 1991) has been one of the primary articulators and advocates of the participation metaphor: Wenger's concept of learning stresses the continuous negotiation of meaning and identity in practice in the mutual, though not necessarily harmonious, engagement with others. This closely corresponds, at the general level, to the dynamicity, open-endedness and flexibility of the Web 2.0 practices and more concretely to the centrality in these practices of "bottom-up" knowledge production, construction, and transformation; of communication and collaboration; and of use and reuse of material across contexts. Such characteristics point to an implicit understanding of knowledge and competence as dynamic, transitory, and situated phenomena. In accordance with the internality of the basic Web 2.0 goals, knowledge, and competence are phenomena of participation—they are only fully realized, ontologically speaking, *in* the acting in concrete situations. In the words of Wenger, "[k]nowing is a matter of participating in the pursuit of [valued] enterprises, that is, of active engagement in the world" (Wenger 1998, p. 4).

For some Web 2.0 practices, this dynamic participationist view is the only incorporated view of knowledge and learning because the point of the practices are the activities themselves. Cases in question are social friendship and dating sites, where the aim of the communication, somewhat crudely put, is the communication itself, not the specific subject matter *of* the communication. Likewise, many activities in the 3D-world Second Life are of this kind (for the same reason), and so is the type of blog which is constructed along the lines of a diary, expressing views, experiences, and so forth, with the wider aim of presenting and negotiating personal identity.

For other practices, there is a second incorporated view, complementing the described one of ongoing activity. This second view corresponds to an "outcome" perspective on the practice. Wikis like Wikipedia and open content sharing systems like Connexions (op.cit.) are relevant examples. Viewed from the perspective of activity, such practices implicitly involve the dynamic participationist view of knowledge as a situated, open-ended phenomenon, in that knowledge is seen as the actual production, use, evaluation, transformation, and reuse of material in the concrete situation. Still, given that participation in the production of, for example, entries in Wikipedia or content in Connexions is not undertaken for the sake of the participation itself, but rather aims at qualifying and/or extending the material available in these systems, the practices in addition incorporate an "outcome" view of knowledge.[5] This outcome view is objectivistic in the sense that the participation concerns itself precisely with the production, editing, and transformation of entry-objects, stored in the system, available for later consultation by oneself and others. But in contrast to the objectivistic ontology implicit in the educational practices, the ontology is not individualistic, because each entry will, in general, be a result of numerous alterations by different people. For this reason, knowledge is not ascribed to individuals, but rather is an attribute of the system. Furthermore, viewing such content systems as reified products of Web 2.0 practices, it seems reasonable to ascribe the concept of knowledge not just to the individual entries, but to the system as a whole: It is precisely the "system as a whole," with its vastness of coverage and its interrelated cross-referencing between entries, which makes it useful as a "knowledge resource." Far from being an individual mental possession, knowledge from this viewpoint is a distributive attribute of a whole system.

[5] The claim that a practice can incorporate different views corresponding to activity and outcome sides of the practice is inspired by Latour (1987). He here argues that scientists are ontological relativists about scientific theories and objects during ongoing scientific activity, but ontological realists about them once controversies have been settled. For a comparison of scientific practice and Web 2.0, compare Waldrop, M. (2008).

Summing up, Web 2.0 practices in their ongoing activity fundamentally incorporate a dynamic participationist metaphor of learning and knowledge. Some Web 2.0 practices in addition incorporate a supplementary distributive, objectivistic view related to its product side, according to which knowledge is an attribute of a system produced by the practices. Both of these differ from the view implicit in educational practices, according to which knowledge and competence is an individually possessed object which can be transferred between practices.

Inherent tensions in Web 2.0-mediated educational activities

Given the discrepancies between the goals and views on learning and knowledge inherent in educational and Web 2.0 practices, introducing the latter into the former leads to tensions in the resulting activities. These tensions can be summarized in the following three interrelated problems characteristic of subjecting Web 2.0 practices to educational purposes: 1) The internal goals of participation, communication, knowledge construction, and knowledge sharing for their own sake are subsumed under the external goal of letting learners acquire the knowledge and competence necessary for their future working life. 2) Dynamic and distributive views on knowledge and competence are enrolled in the service of an individualistic, objectivistic view of knowledge and competence. 3) Learning as participation, the view of learning implicit in Web 2.0, is understood as a *means* for realising learning as acquisition, that is, is viewed as a pedagogical method. As will be shown shortly, these tensions have practical implications for issues such as collaboration, evaluation, and the general aim of material produced by students.

Incorporation of the practice logic

A comment must be made about the relationship between the practice logic, the "historical body" of the individual participants in educational practices, and the views they explicitly endorse. As evidenced in both academic and public journals and at teacher conferences, many teachers within higher education themselves call the individualist, objectivist view of learning and knowledge of the acquisitionist metaphor into question. This, of course, is *one* of the reasons why Web 2.0 practices are being introduced as learning activities in the first place. One might, therefore, wonder if the tensions pointed to in this article were to vanish if only the participants could agree between them on an understanding of knowledge and learning more in line with the implicit Web 2.0 one.

The point, however, is that no matter what explicit view the participants might have, they will, in practice, be committed at least to some extent to the implications of the objectivistic view. Importantly, this commitment will be both institutionally and individually grounded: Institutionally, because it is instantiated in—among others—existing forms of examination and evaluation, in requirements of individual grading of students, and in the explicit formulation of learning goals in terms of skills and knowledge domains which the student should come to "possess." Individually, because the educational practice logic will always at least to some extent be incorporated in the "historical bodies" (Scollon and Scollon 2004) or "body schema" (Merleau-Ponty 1962; Dohn 2009) of each participant through their many years of participation in educational practices (as pupils, students, and teachers). Building on Dohn (2009), the "body schema" will supply a background structuring of the situation. This background structuring will play a decisive part in determining *which* are the "figures" of the situation (the learning activities, evaluation procedures, curricula demands, etc.) as well as the meaning these "figures" more

specifically have; the roles each participant has in them; and the affordances they pose for him/her. Because of the incorporated practice logic, the body schema will supply a background structuring of educational practices along acquisitionist lines, even if the participant explicitly renounces this view. The examples in the last section will illustrate how this may bear out in practice.

Transcending the dichotomies?

At this point, various objections may be put forward[6] to the effect that it is of no great surprise that Web 2.0 and/or educational practices must be reshaped to fit each other, given that they originate in different contexts. Also, if no such reshaping takes place, it is (as one anonymous reviewer put it) "not a miracle, but ... to be expected" that problems arise. Interestingly, objections here fall into two general categories, corresponding to whether the objector fundamentally adheres to an acquisitionist or a participationist understanding of learning. In a sense, this fact underscores the claims of Sfard (1998) that the metaphors are basic and irreconcilable, and of this article that they are incorporated in our way of meeting the world in practice, that is, in our "body schema," and that they, therefore, are very difficult to transgress.

The first category of objections center on the question of alignment (Biggs 2003) of learning objectives and learning activities and argue that if Web 2.0 practices do not support the given learning objectives, these practices of course must be reshaped or abandoned. To this category of objections, I think the most appropriate answer is that, of course, we can take the strategy of "taming the screw," that is, of harnessing Web 2.0 tools (not activities) to existing goals and views of education. But that we in so doing both risk jeopardizing the obvious potential merits of Web 2.0 activities (not tools) of intrinsic meaningfulness, student motivation, participation, and collaborative knowledge construction. Perhaps even more importantly, we risk ignoring the potential which Web 2.0 activities with their incorporated participationist understanding of knowledge and learning have of challenging and transforming the educational system in ways which might be appropriate to individuals, communities, and societies of today.

This is the thrust of the second category of objections, picking up on the vision of Scardamalia and Bereiter (1994) that implementing computer-supported learning activities may be an effective way of transforming education from within. More specifically, transforming it from being an obligatory, isolated, and not intrinsically meaningful part of life to a part which offers possibilities of authentic, motivating knowledge building in collaboration with others and in interaction with the surrounding environment. Objections in this category, therefore, center on questioning the rigid dichotomy between Web 2.0 and educational practices, stressing: 1) The dichotomy is not one of principle though it may exist practically and perceptibly because of the way education has traditionally been organized and because of institutional barriers to its transformation, including corporate pressures, summative evaluation demands, and obsolete teacher education. 2) Many existing pedagogical strategies already seek to transcend the basic separation between "school practices" and "working life practices" and the individualistic, objectivistic view of knowledge and competence inherent in traditional pedagogy. This means *both* that the educational system already incorporates other understandings of knowledge and learning than the acquisitionist one, that is, there is not even a rigid dichotomy in practice, *and* that Web 2.0-mediated

[6] I would like to thank all four anonymous reviewers and G. Stahl for doing so.

educational activities are not unique in aiming at overcoming the institutional barriers, but have a line of predecessors. This category of objections calls for a subsection of its own.

Transcending dichotomies or implementing tensions?

Basically, I agree with the thrust of the second category of objections, the consideration of which will serve partly to underscore and partly to further develop the argument presented so far. It is definitely true both that Web 2.0-mediated learning activities have predecessors and that the educational system might change so as to dissolve the dichotomy between the practice logics of education and Web 2.0: To some extent, pedagogical approaches such as, for example, problem-based learning (PBL; e.g., Wilkerson and Gijselaers 1996; Boud and Feletti 1997; Fogarty 1998), problem-oriented project pedagogy (POPP; Illeris 2004; Dirckinck-Holmfeld 2002), and at least some versions of portfolio pedagogy (Klenowski 2002; Dysthe and Engelsen 2004) are already challenging this dichotomy from within. This challenge, it should be noted, is not grounded in the student activity, central to all of these strategies, per se because activity as a prerequisite for learning is quite compatible with the acquisitionist understanding of knowledge and learning, as is evident in constructivist theories as the ones referred to above. Rather, the challenge arises when activities within these pedagogical approaches succeed in bridging working life settings and educational ones by bringing authentic working life problems into school settings *as* authentic problems (not just as illustrative examples) and/or by organizing educational tasks within working life settings. That is, the challenge stems from the fact that the work of the students will actually make a difference in the working life practice. The hub of the matter is here not the motivational aspect; though the cited literature points out that such authenticity *is* motivating for the students. The simple point is, quite parallel to the point of this article concerning Web 2.0, that in such cases the practice logic of the working life setting will be allowed to challenge the educational one.

Ideally, in such cases the "breaching of walls" between educational and working life settings establishes what Wenger would call a boundary practice (Wenger 1998) which borders on and to some extent incorporates the practices on both "sides." This boundary practice potentially may change the status of the goal of the educational activity and make it partly internal through the authenticity of the problem and the acknowledgement of the student as a contributor by practitioners in the working life setting. Depending on the kind of project/problem and the interaction the student is allowed (by both sides) to have with the practitioners, the boundary practices might even incorporate aspects of a participationist view of knowledge and learning to challenge the acquisitionist educational one.

However, as implicitly hinted at through some of the case studies discussed in, for example, Boud and Feletti (1997) and in Dysthe and Engelsen (2004, 2005), and as is widely acknowledged in practice amongst teachers within the POPP, PBL, and portfolio approaches[7], the ideal case is only rarely realized: 1) Very often no "boundary practice" develops and the students are in effect left alone with the bridging issue. 2) Even when "boundary practices" develop, they are very fragile and tend to terminate at the point of assessment of the work of the students. The problem in both cases is that the authentic project on which the students work serves to *introduce* the practice logics of both working

[7] This claim is based on informal conversations with teachers working with these pedagogical strategies in the fields of learning, communication, and humanistic information science within tertiary education. The conversations have taken place over the last five years, very often in relation to supervision and evaluation of concrete student projects focused on authentic working life problems.

life and education in the same setting, but not to transcend or synthesize them. In the first case, the students are in effect given the task of accommodating simultaneously to working life demands of, for example, usefulness of the results for the practice here and now, and to educational demands that they individually document their acquisition of the relevant academic and subject-related skills and knowledge. In the second case, the tensions between such demands make the "boundary practice" unstable during the development of the project to the point of breaking when their degree of fulfillment has to be evaluated.

These considerations enable a refinement of the argument presented this far: The dichotomy pointed to between the educational practice logic and the Web 2.0 one is not one of eternal principle. Introducing Web 2.0 practices into educational ones can be seen as a further, accentuated step on the path envisioned by Scardamalia and Bereiter (1994) where the dichotomy is challenged from within education by utilizing networked media to redefine learning as the authentic knowledge building of communities. However, the problems which pedagogical strategies like PBL, POPP, and portfolio get when seeking to transcend the dichotomy on the other hand serve to underscore the groundedness of the acquisitionist metaphor in education of today. If not of eternal principle, the dichotomy is definitely of practical reality. This is so not least of all because the acquisitionist understanding of learning and knowledge is incorporated into the body schemas even of the proponents of the alternative pedagogical strategies, leading to their background structuring of authentic collaborative student work in terms of the demand for individual assessment. This point is echoed in the observation of Dysthe and Engelsen (2004) that "our experience is that discussion about changing the assessment system from traditional exams to a portfolio-based system is often reduced to the question of how to secure fairness and justice according to psychometric ways of thinking" (p. 255).

Reconciling the metaphors

A last comment should be made on the development in Sfard's thoughts on the distinction between acquisitionist and participationist metaphors of learning, as evidenced in her latest book (2008). As noted by Stahl (2008), she here, in contradiction to her claims in Sfard (1998), actually moves a long way toward reconciling the acquisition and participation metaphors of learning *at the theoretical level*. This is done concretely through giving a participationist interpretation of the "objects" of learning, more specifically of a "math object" as a product of math discourse consisting of the recursive tree of its visual realizations. More generally, Sfard shows how math education can be construed in a participationist perspective as concerned with supplying opportunities for students for increasing their abilities to engage in life within the math culture. Following up practical implications of the theoretical reconciliation in Sfard's position seems a promising way to go in the design of learning activities to overcome the tensions exposed in this article. However, the aim here is to point at the groundedness of the problems such design would face: Even if we as analysts, theoreticians, and educational designers can reconcile the metaphors as Sfard does by reinterpreting essential concepts from the one within the scope of the other, the metaphors are incorporated into the practice logics of the practices. The real problem lies in reconciling them here by changing the practices, not in changing our perspective on it.

Challenges in practice

The problems indicated for activities utilizing PBL, POPP, and portfolio are expanded and accentuated in Web 2.0-mediated learning activities. This is so because the Web 2.0

practices incorporate the participationist understanding of learning and knowledge in a way and to an extent that the other pedagogical approaches do not, even if some activities within them centre on authentic working life problems which supply a tension between internal and external goals similar to the one in Web 2.0-mediated learning activities. In the following, some examples will be presented to illustrate how the inherent tensions bear out as challenges in practice. These challenges concern: 1) the role of collaboration in learning, 2) the subject matter and criteria relevant for evaluation, and 3) the general aim and status of the material produced by students. Their presentation draws on experiences with Web 2.0 activities in three consecutive classes of the same BA course (i.e., involving different students) and five classes of (in all) four different MA-level courses (most students participated in two courses) at The University of Southern Denmark. The Web 2.0 activities centred around:

- collaborative student production and peer editing of a wiki presenting and discussing course content (all eight classes. For one class, the wiki spanned two consecutive courses and the students were allowed to draw in material from other concurrent courses. In one class, wiki entries had to be produced in groups, in two classes, they had to be produced singly; in the rest, it was optional as long as a certain "quota" per student was produced)
- students posting questions relating to course material on a course blog ahead of lessons as a way of allowing the teacher to focus the learning activities of the lesson (one class; it was optional whether questions were formulated alone or in groups)
- conducting lessons in Second Life with a focus on illustrating and elaborating central theoretical concepts of the course (such as "agency," "action," "reason," "cause," and "norm") through activities and happenings here (one course).

In all courses but one the Web 2.0 activities were an obligatory part of pass/non-pass exams.

The role of collaboration in learning

The first example concerns the role of collaboration in learning. Engaging in Web 2.0 practices is a "bottom-up," non-compulsory action undertaken because the interaction itself and/or the material co-produced in the interaction are experienced as intrinsically meaningful. Therefore, the practice logic accords collaboration importance in relation to *what* is done. *Who* contributes with what is less important than *that* the contribution is given, and that it stands a chance of being supplemented or qualified through the participation of others. Strictly speaking, there is no such thing as "freeriders" and it certainly is not an important problem: Because openness is seen as an inherent value, it is fully legitimate that others use the resulting material even if they do not contribute with anything new themselves.

In contrast, when utilizing Web 2.0 practices within educational ones, collaboration and interaction no longer are goals in themselves, but instead are means for realizing the goals of the educational practices. This creates tensions concerning the focus of the activities: Referring to the discussion of alignment above, to which extent should learning goals inherit the Web 2.0 focus on the collaborative process and the collectively produced material or, alternatively, to which extent should the activities undertaken with Web 2.0 tools be aligned to support individual acquisition by the learners, utilizing collaboration as a means? Equally, it creates tensions regarding ownership, authorship, and requirements of individual contributions of comparative quantity and quality. According to the educational practice logic, non-contribution is "freeriding" and is considered cheating. Teachers and students, incorporating this logic, experience it as such. In general, teachers aspire to give

each student "his/her due" in evaluation and students, equivalently, wish to get "credit" for their contributions and are reluctant to share "their" knowledge—for example, the wiki entries they produce—if they do not get as much in return. These attitudes are then challenged head-on in practice by "freeriders" in Web 2.0-mediated learning activities, who incorporate the practice logic of Web 2.0 and, therefore, think of themselves as acting quite legitimately when they make use of material produced by others for their own purposes, including assessment-related ones.

One way of dealing with this challenge is to dictate a minimum of entries that each student must contribute with as a significant part of course assessment. A study by Singer (2008) indicates that this may, in fact, be necessary for students to initiate participation at all. To the extent that this is so, it underscores the way the intrinsic meaningfulness of Web 2.0 practices is jeopardized by being subsumed under the educational practice logic. Singer does, however, report that though compulsion was needed to *initiate* participation, some students continued participating even after maximum points had been achieved, thus suggesting that participation became meaningful in the process. The same tendency that some students would contribute a good deal more than required was observed in the courses conducted by the present author. But in accordance with the postulated non-acceptance of "freeriding," these same students have nearly all made more or less annoyed comments about the lack of activity on the part of their fellow students and the demotivating effect it had on them as well.

Actually, making a certain amount of contributions mandatory only displaces the tensions regarding collaboration: In several of the above-mentioned courses, some students (alone or in groups) "rushed to take" the wiki entries about the more popular parts of the course content, leaving others frustrated because they could not think of other relevant entries to write and so feared they would fail the course.[8] In one extreme case, a group of students had delivered a high quality oral presentation of a course subject in class and very reasonably from the educational practice logic point of view considered this "their" subject for a number of wiki entries. They were understandably very dismayed when another student "stole" it and made numerous entries in the wiki about it. They found they "had done all the work" of structuring the subject and that the other student was largely "freeriding" in writing it down. Though from the Web 2.0 point of view, what the student was doing was just to reuse the material from the oral presentation (unimportantly made by someone else) in the wiki presentation (unimportantly made by him).

In another course, the requirement that students revise the wiki entries of one another led them to make "bargains" where the first author of an entry would deliberately make mistakes or leave aspects out of the account so the others had something to correct. This way, the first student would have an easier entry to write and more than one student could be secured easy revisions. At the same time, they had found a way around the discomfort they felt about revising the entries of one another.[9] The aim of using collaboration and peer revising to qualify the material in the wiki was thus undermined by the educational, assessment-related coloring which the demand for revisions got in practice.

[8] It was one of the learning objectives of the course that the students be able to identify issues themselves so no final list of wiki entries had been supplied by the teacher.

[9] This discomfort was reported by the students in many of the courses and is further documented in the study of Lund and Smørdal (2006). It certainly enhances the collaboration problems which the discrepancies between educational and Web 2.0-practice logics lead to. A similar discomfort is not found on anonymous Web 2.0 sites like Wikipedia. However, anonymity of Web 2.0 sites versus non-anonymity of educational Web 2.0 activities alone cannot account for the problems which the latter have, as can be seen by the fact that people engage in lively commenting, revising, and editing on non-anonymous Web 2.0 sites like Connexions, Facebook, or personal blogs.

Subject matter and criteria of evaluation

Turning to the question of what precisely is to be evaluated and according to which criteria, Web 2.0 criteria of evaluation do not concern documentation of "knowledge possessions." Instead, they concern the extent and meaningfulness of participation, along with, for some practices, the scope, usefulness, and quality of the material. Evaluations, therefore, do not centre on individual contributions, and even less on the question of what individual participants might have acquired in terms of knowledge and competence *through* the collaboration.

This, as argued, is at variance with the educational practice logic. However, it might seem that a resolution of the tensions here would be a matter of alignment: If Web 2.0 competence (i.e., competence in the use of Web 2.0 and of Web 2.0-evaluation criteria) were added as a learning objective for the students and the focus of evaluation adjusted accordingly, alignment with the inherent logic of the Web 2.0 activities ought to be possible. Even from the acquisitionist point of view, this might seem reasonable, because the future working life of the students may well demand Web 2.0 competence of them. However, in actual practice, the tensions are far from resolved and the challenge remains evident, as illustrated by the following problems.

Participation- or content-related criteria?

Firstly, if Web 2.0 criteria are to be used, to which extent should student participation be evaluated only on participation-internal grounds, for example, according to the degree and way an entry contributes to the negotiation of meaning and to the identity negotiations of participants? From a Web 2.0 point of view, this would be reasonable, at least for activities of the kind found on friendship sites and on certain blogs, where communication itself is the goal. For such activities, adding quality-related demands to the meaning to be produced is artificial at best and self-contradictory at worst, with a negative effect on the actual authentic engagement by the students in these kinds of activities as a foreseeable result. Nonetheless, from the point of view of the educational practices, which have the goal of ensuring a certain level of knowledge and competence, participation and negotiation of meaning and identity can hardly be enough in itself.

The reality of these worries is substantiated by reflecting on studies such as those reported by Singer (2008), Farmer et al. (2008), and Ducata and Lomacka (2008). Here, student blogs were integrated in the learning and assessment activities in different courses (thematically ranging from culture and media studies to foreign language courses) with up to 30% of the final assessment grade (the case reported by Farmer et al.). In all of the courses, the assessment prioritized *participation* in blog-writing and -commenting over the *quality* of the content produced. In some of the courses, participation appears to be the only assessment criteria (those reported by Singer and some of those reported by Ducata and Lomacka). In the words of Farmer et al. and in concordance with the Web 2.0-practice logic "It was strategically decided to keep guidelines on content and style to a minimum in order to maximise students' sense of ownership and self directed investment in the exercise" (p. 125). The reasonableness of the worry that this primary focus on participation might be at the expense of the quality of "knowledge and skills to be obtained" is brought out in the same study: Indirectly by the positive, but very participation-focused responses of some students, for example, that the blogging allowed "Voicing my own opinions for others to read and online interaction with other students" and that "The most valuable [aspect of blogging] was the manner in which you could interact with others from your course and

discuss ideas with them in real life situations you can relate to." It is brought out directly by a number of students who found the experience of blogging positive, but strongly disagreed with its educational value. According to one very negative student response, it was "quite a useless task... mundane and redundant" (Farmer et al. 2008, p. 132–133).[10]

Who is to evaluate?

Secondly, a further question concerns *who* is to evaluate. Web 2.0 activities have distributive peer responsibility and no designated experts to control the quality of interaction and production whereas in education, of course, the right and duty of assessment is ultimately the teacher's, though s/he may try to involve the students in the process. The tension here, therefore, manifests itself in the lack of clarity concerning the role of the teacher in Web 2.0-mediated learning activities (cf. Lund and Smørdal 2006). Concretely, in the above-mentioned courses, the incorporated practice logic of the students led them to await and actively seek teacher response to their entries, instead of responding to, editing, and qualifying the entries of their fellow students. In some of the courses, peer-to-peer response required repeated encouragement by the teacher. Further, once teacher response had been obtained, students tended to regard it as "expert knowledge" not easily contested. The teacher's involvement as evaluator, therefore, seemed to greatly inhibit the openness, peer responsibility, and dynamicity of knowledge production.

On the other hand, if the learning activities are designed in concurrence with the characteristics of Web 2.0 so that quality control stays a peer matter, the teacher is arguably not living up to the pedagogical responsibilities posed on her/him. This is so because s/he fails to supply feedback on the degree of "knowledge possession" displayed in the Web 2.0 activities. In practice, this lack of responsibility may have very unpleasant consequences for the students, if they draw upon their Web 2.0 material in later exams or assignments, trusting their knowledge constructions to be adequate by the standards of their education, without this actually being so.

The practical dilemma, therefore, is one between: a) inhibiting the process of continuous dynamic knowledge construction by students sharing a collaborative ownership/responsibility; and b) relegating the material useless for the students because they have no assurance of its trustworthiness, thus putting an effective end to the Web 2.0 use of the material. Body-schematically, the horns of this dilemma are experiences as the simultaneous pull in two opposite directions, that is, toward letting student production unfold itself unhindered and as the near-physical urge to start typing a response on the keyboard.

The status of "patchworks"

Thirdly, evaluating according to Web 2.0 criteria, what counts is the usefulness and perhaps, the truth/reasonableness of what is produced, but not the origin of production itself. According to these criteria, then, a "patchwork" or copy-paste of resources produced by others with no novel additions provided by the "patchworker" can, in principle, constitute a high quality Web 2.0 contribution. Provided, of course, that the "patchwork" is done in such a way that the synthesis shows consistency, coherence, and homogeny of style. Such "patchwork" excerpts have indeed been introduced as wiki entries in some of

[10] It should be noted that other student comments concern the blog helping them to "encode information" and "get a further grasp on the ideas we were discussing" (p. 132) which indicates that at least some of the students had a quality focus over and above the participatory one.

the courses taught by the author of the present article. Now, from the point of view of the educational practice logic, these entries could only be regarded as an unoriginal collection of notes, bordering on plagiarism. By not being formulated "in their own words," they did not constitute a demonstration of a "knowledge object" individually possessed by the students. At most, it demonstrated their skill in collecting relevant material, but not the "acquisition" (in the form of "having" an "understanding") of the material itself.

On the other hand, from the Web 2.0 point of view, "collecting relevant material" will be an important part of knowledge (or knowing) understood as the dynamic use and reuse of material across contexts. Requiring the students to reformulate the material from this perspective seems a waste of time, at the very least: If the material has already been produced by someone else, time would be better spent *using* the material in novel ways. Furthermore, the "patchwork" synthesis might actually be *better* in terms of usefulness and reasonable argumentation than anything the students could produce "in their own words." So from this perspective, the distributive knowledge-sharing process of the learners could actually be harmed by demands for "independency" of material production. This dilemma is echoed in the protests of students when derided for presenting assignments largely consisting of copy-pasted resources: "The quoted authors put the points so precisely—why should I alter their formulations to something less precise?"

The aim and status of the Web 2.0 material

The problem of "patchworking" points to a further challenge related to the general aim and status of the material produced by the students, that is, to the question of *for what* the material is produced. Taking again the course wiki example, if this wiki is truly to realize a Web 2.0 practice, its purpose will not be knowledge construction for the course. Rather, the aim of integrating it into the course will be to produce material that can be put to authentic use (including further editing and transformation) in *new* Web 2.0 activities in later courses and in future working life. Therefore, the primary status of the material is that of authentic, if provisional, reification of potentially useful knowledge. On the face of it, this may seem to fully accord with the goal of the educational practices, namely to let learners acquire knowledge transferrable to other situations. In practice, however, it does not, because, quite analogously to the "patchworking" problem, the demands of documentation of knowledge acquisition by the students interfere. The consequence is a challenge to the viability of the Web 2.0 aim of constructing a "knowledge base" genuinely useful later on and a risk that the material in practice for students as well as for the teacher will just have the status of "something produced for the course."

The problem can again be illustrated with an example from one of the courses taught by the author. Here, one student published a Web excerpt from a site similar to Wikipedia as a course wiki article. The student included no reference to the site and, unlike the "patchwork" example, supplied no independent juxtaposition of resources. What the student did in effect was to ease access to material in principle already available on the WWW. From the Web 2.0 point of view, because the purpose of the wiki was the production of a knowledge base which could serve as an authentic tool in later use, and because the excerpt actually did add new, relevant content to the wiki, the action was not to be reproached: It constituted one way of realizing non-copyright-based knowledge sharing aimed at future use and reuse. However, viewed from within the educational practice, the action can only be regarded as cheating. Passing this judgement, however, amounts to asserting that the primary, general aim of the wiki, in contradiction to the explicitly formulated Web 2.0-related aims, was indeed material production "for the course."

Concluding remarks

The purpose of this article has been to show that implicit in Web 2.0 and educational practices are divergent understandings of knowledge and learning, that these are incorporated at both the institutional and the individual level, and that though the introduction of the first in the latter may be a further step on the path initiated by Scardamalia and Bereiter (1994) of changing education through authentic computer-mediated knowledge building, we have some very real challenges to face on the way. It has been argued that such challenges show up in issues concerning collaboration, evaluation, and the general aim of material production by students.

By way of rounding off the article, I wish to stress that the emphasis of the article on tensions and challenges is not a denial of the pedagogical possibilities for education of Web 2.0 practices. Rather, given the obvious potential merits that such practices have in terms of student motivation, participation, and collaborative knowledge construction, the point has been to call attention to problems stemming from inherent conceptual discrepancies that must be taken into account if one wants to realize these potential merits in practice. My own continuing efforts in trying to balance between participation-based evaluation criteria and content quality-based ones; between aims of future usefulness and demands of documentation here and now; and between collaboration as a means and as a goal are all undertaken in the attempt to realize the merits. Whilst at the same time acknowledging that at the current stage of educational development, overcoming the challenges in one area tends to displace them to others because both I and the students, as much as the institutions we act in, incorporate the tensions in our body-schematic background structuring of the "figures" of the activities we undertake.

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