Web 2.0-Mediated Competence – Implicit Educational Demands on Learners

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Abstract: The employment of Web 2.0 within higher educational settings has become increasingly popular. Reasons for doing so include student motivation, didactic considerations of facilitating individual and collaborative knowledge construction, and the support Web 2.0 gives the learner in transgressing and resituating content and practices between the formal and informal learning settings in which s/he participates. However, introducing Web 2.0-practices into educational settings leads to tensions and challenges in practice because of conceptual tensions between the views of knowledge and learning inherent in Web 2.0-practices and in the educational system: Implicit in Web 2.0-practices is a conception of 'knowledge' as, on the one side, *process* and *activity*, *i.e.* as use, evaluation, transformation and reuse of material, and, on the other, the product side, as a *distributed attribute of a whole system* (such as Wikipedia) or community of practice (such as the community of practice of Wikipedia contributors). In contrast, 'knowledge' within the educational system is traditionally viewed as a *state* possessed by the individual, and learning as the *acquisition* of this state. This paper is an analysis of the challenges which these tensions lead to for the learners. The argument is that Web 2.0-mediated learning activities within an educational setting place implicit competence demands on the students, along with the more explicit ones of reflexivity, participation and knowledge construction. These demands are to some extent in conflict with each other as well as with the more explicit ones. A simple example of such conflicting competence demands is experienced when students develop a course wiki: The Web 2.0-competence demands here concern the *doing* something *with* the material. The copy-pasting of *e.g.* a Wikipedia-article without referencing it from this point of view is a legitimate contribution to the knowledge building of the course wiki. In contrast, educational competence demands require the student to participate actively in the formulation of the course wiki-articles. Copy-pasting without reference from this point of view is cheating. Here, the student is met with the incoherent requirement of authoring entries that display the acquisition of a knowledge state in a context where authorship is renounced and knowledge is understood dynamically and distributively. More generally, in Web 2.0-mediated educational learning activities, the student is required to manoeuvre in a field of interacting, yet conflicting, demands, and the assessment of his/her competence stands the risk of being more of an evaluation of the skill to so manoeuvre than of skills and knowledge explicitly pursued in the course.

Keywords: Web 2.0 in education, wikis, second life, competence, concepts of knowledge, concepts of learning

1. 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 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.

In this paper, the phenomenon of Web 2.0 is approached from a practice perspective (Dohn 2009), *i.e.* is seen as a set of *activities or practices* for which most or all of the following attributes apply:

- 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

From this perspective, being 'Web 2.0' is not a binary function, but a question of degree, as any given concrete activity may be characterized to a greater or lesser extent by the attributes on the list, and by more or less of them. Further, according to the practice perspective, Web 2.0-activities do not

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necessarily take place exclusively in a virtual environment: As long as web-mediated resources and activities are utilized in ways describable by the characteristics on the list, some of the contexts in which this is done may well be physical.

In many upper tertiary educational programmes, Web 2.0-practices are being introduced into the teaching and learning activities. To give just a few examples, it is done at 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 the University of Southern Denmark (where the author of this paper teaches). There are many good motivational, didactic, and learning theoretical reasons for doing so (confer *e.g.* Cress & Kimmerle 2008; Rick and Guzdial 2006; Yukawa 2006; Bruns & Humphreys 2005; Boulos *et al.* 2006; Lund & Smørdal 2006; Dalsgaard 2006; Fountain 2005): Since students engage voluntarily in Web 2.0-mediated communication in their spare time, employing these same communication practices in the service of learning ought to help them enter the learning practices of the university, both in respect of their motivation and of the skills required of them. At the same time, the user-centred focus of Web 2.0-activities will in itself support them in transgressing and resituating content and practices between the formal and informal learning settings in which they participate. Furthermore, because of the centrality of participation, production, dialogue and collaboration in Web 2.0-practices, such practices seemingly are ideal ways of facilitating individual and collaborative knowledge construction. Finally, competence in the use of Web 2.0 – *e.g.* skills in navigation, communication, and critical evaluation – appears to be a reasonable learning objective in its own right, since the future working life may well demand such competence of the students.

However, introducing Web 2.0-practices into educational settings is not a straightforward matter because of conceptual discrepancies between the views of knowledge and learning inherent in Web 2.0-practices on the one hand and in the educational system on the other. These discrepancies lead to challenges in practice, not least for the learners, because of the inconsistent competence demands which they result in. The aim of this paper is to give a theoretical analysis of these inconsistent competence demands and the challenges they in practice pose for learners. The analysis will be supplemented with considerations of two examples: learning activities with wikis and Second Life. These examples draw on experiences from five courses using wikis and two courses using Second Life. They are introduced, not as empirical evidence, but for illustrative purposes only; to concretize the theoretical claims.

The structure of the paper is as follows: First, the conceptual divergence in the views of knowledge and learning of Web 2.0-practices and educational ones are shown to exist. Second, the implicit and explicit competence demands placed on students are analysed, as are the tensions between them. Thirdly, 'web 2.0-mediated competence' is argued to consist in the complex ability to respond adequately to the way the conflicting demands actualize in specific learning situations.

2. Conceptual discrepancies between Web 2.0- and educational practices

Inherent in educational practices is the view of knowledge and competence as 'a something' – an entity, state, disposition, ability or the like – which is possessed by the individual in abstraction from the concrete situation. This view, of course, does not have to be endorsed theoretically by the individual participants in the educational practices (the teachers and learners). However, it is part of the underlying rationale of an educational system where the practices of learning (aimed at the *acquisition* of knowledge and competence) are separated from the practices of acting (where the 'acquired knowledge and competence' allegedly is *exercised*): Without the implicit view of knowledge and competence as objects to be acquired, possessed, transferred and exercised with no major loss or transformation in new contexts, education as separated from professional life would not make sense. *Given* this view, on the other hand, it seems very reasonable to establish separate practices focusing on the acquisition of the object, so that the learner will not be met with the demands of professional life, before s/he is *qualified* to do so – in the sense of possessing the full knowledge and competence 'object' judged necessary to participate in this life.

As argued by Sfard, in contemporary educational research this objectivistic and individualistic view of knowledge is being challenged by another view according to which learning is participation and knowledge is situated doing (Sfard 1998). In Sfard's article, however, the two views are presented as metaphorical frameworks (Lakoff & Johnson 1980) with which one in principle can regard any learning practice. In contrast, the argument in this paper is that educational practices intrinsically build upon

the acquisition metaphor, whereas Web 2.0-practices incorporate the participation metaphor to a very high degree. The question of a possible reconciliation between the metaphors is therefore not just the theoretical one of upholding two divergent perspectives, but the very practical one of bridging or integrating practices.

The claim that Web 2.0-practices instantiate a view of knowledge and competence as situated doing is motivated by noting the dynamicity, open-endedness and flexibility of the practices, concerned as they are with the continuous 'bottom-up' production, use and reuse of material across contexts, and by the centrality in these practices of open-ended knowledge construction, knowledge transformation, and communication: These characteristics show the practices to incorporate a view of knowledge and competence as dynamic, transitory, and situated phenomena, *i.e.* phenomena of participation. They are, on this view, only fully realized, ontologically speaking, *in* the acting in concrete situations. In the words of Wenger, who together with Lave (Lave & Wenger, 1991) has been one of the primary articulators and advocates of the participation metaphor "Knowing is a matter of participating in the pursuit of [valued] enterprises, that is, of active engagement in the world" (Wenger 1998, p. 4).

This view of knowledge is the one implicit in Web 2.0-practices, when these are regarded from the perspective of ongoing activity. For some Web 2.0-practices this is the only really meaningful perspective to take, since these practices aim primarily or solely at the activities themselves, not at any specific outcome of the activity. Cases in question are social friendship sites, where the aim of the communication is the communication itself, not the specific subject matter *of* the communication, and the type of blog which is constructed along the lines of a diary; expressing views, experiences etc., with the wider aim of presenting and negotiating personal identity. For other practices, however, there is another perspective from which the question of knowledge must be viewed as well. Wikis like Wikipedia and open content sharing systems like Connexions are relevant examples: Given that participation in the production of entries in Wikipedia or content in Connexions is not undertaken for the sake of the participation itself, but rather aims at qualifying the material available in these systems, it is appropriate to adopt an 'outcome' perspective, too. And viewed from this perspective, Web 2.0-practices such as these must be said to *also* implicitly involve an objectivistic ontology of knowledge, since the point of the participation is precisely the production, editing and transformation of entry-objects, stored in the system, available for later consultation by oneself and others. 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. Far from being an individual mental possession, knowledge from this perspective is a distributive attribute of a whole system.

In general, therefore, inherent in Web 2.0-practices are two different views of knowledge, related to the activity and the product side of the practices, respectively. The first is a dynamic view of knowledge and competence as doing, the second is an objectivistic view of knowledge as 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.

3. Implicit and explicit competence demands in Web 2.0-mediated educational activities

3.1 Three analytic levels of demand characteristics

Analysing the complex of competence demands placed on students in Web 2.0-mediated educational activities, it is helpful to distinguish three different levels at which any situation poses requirements, possibilities and restrictions (henceforth demand characteristics) for adequate acting. The distinction is inspired by the schematic proposed by (Dohn 2007), but is somewhat adapted to fit the learning-theoretical focus of this paper. Importantly, the distinction of levels is an analytical one. The point is *not* that demand characteristics at different levels exist unrelated to each other. On the contrary, the whole point of distinguishing the three levels is to be able to discuss the way the demand characteristics at the different levels interact, interfere and contradict each other when Web 2.0-practices are utilized as educational activities. With this comment, the following levels of demand characteristics can be distinguished:

- *The domain-internal level* determined by the domain which communication is about, *i.e.* the focus area of the learning activities, for example literary novels, organic chemistry, set theory, and

philosophy of education. Demand characteristics at this level include domain-specific traits, facts and perspectives such as that magical happenings are appropriate in fairy tales, that in set theory A U B only equals the number of elements in A plus the number of elements in B if A ∩ B = 0, and that within the philosophy of education propositions about different senses of 'constructivism' include ontological, epistemological, pedagogical and methodological perspectives.

- *The activity-internal context level* determined by the context of the activity itself. This is the level of demands placed by Web 2.0-practices like wiki construction, blog participation, and Facebook interaction. Likewise, it is the level of demand characteristics of collaborative problem solving; individual oral presentation; scripted or 'free' group discussions (oral or written); role play scenarios; lecture attending etc. Demand characteristics at this level include that students sit relatively quietly whilst attending lectures; that scripts be perceived and acted upon as 'scaffolds' for discussion; that certain implicit rules of cordiality be followed in group discussions; and that Web 2.0-activities usually involve renunciation of copyright and requires a 'use-and-reuse'- and 'lack of finality'-perspective on the material.
- *The activity-framing context level* determined by the actual 'real life' context in which the activity is taking place. Among such contexts are 'using one's spare time', 'shopping for necessary groceries', 'carrying out a task for one's boss' and 'participating (physically or virtually) in a class within an educational programme'. Demand characteristics at this level include tackling disagreements in 'group discussions' between invited guests at home in a way that is in accordance with the duties of the host; acting in a socially acceptable way towards one's boss in receiving and carrying out one's task; and not handing in as one's own a class assignment written by someone else.

It should be noted that 'domains of communication' are exactly that: they are what is actually being (or should be) talked about in the given situation. No claim is being made that 'domains' exist in the abstract, nor do 'domains' have a definite level of generality. In the context of a literature course in an English program, 'postmodern American literature' might be a domain, whereas in the context of a primary school course on basic genre theory this topic would most probably be just a part of the domain of 'literary novels'. Similarly, precisely which level of generality an 'activity' has may vary between situations: In the context of collaborative problem solving, group discussion is obviously a *part* of carrying out the activity, whereas in other situations the discussion may itself be the activity which students are asked to undertake.

3.2 Demand characteristics of Web 2.0-mediated educational activities

In accordance with the analysis given above, competence demands of Web 2.0 at the activity-internal context level centre on participation and production. Some of the demand characteristics at this level are explicitly acknowledged and constitute the very reason for employing Web 2.0-activities. This is the case for the demand characteristics of active engagement, bottom-up sense-making, multi-way communication, collaborative knowledge construction, and reflexivity concerning quality and trustworthiness of material. However, the way these demand characteristics present themselves as requirements, possibilities and restrictions *at* the activity internal context level is *not* with the focus of the educational practice: At the activity-internal context level, the enumerated demand characteristics are structured and made sense of through the further implicit demand characteristics of continuous use, dynamicity, open-endedness, and distributivity. Competence demands therefore centre on the communicative interaction, the usefulness of material, and the perspectives for its further use, more than on the individual person communicating and using the material. For those Web 2.0-practices where the perspective of ongoing activity is the only really meaningful one to take (cf. above), competence demands primarily, perhaps even solely, concern *ways of participating and negotiating identity*, and only secondarily, if at all, does it matter *what* more specifically is being communicated about. When interacting with strangers in a virtual café in Second Life, for example, what counts is your 'style' of interaction, your communicative attitude, and the identity you signal by your appearance and by what you say and do, much more than the content of what you actually communicate *about*. The stylishness of the café interior hardly matters in itself to the Second Life participants; what matters is the mutual identity construction and negotiation which is brought about *through* discussing, applauding, or ridiculing the design of the café; as well as the friendliness you show in communicating about this matter at all with a stranger. In other words, the demand characteristics at the activity-internal context level of Second Life tend in practice to counteract the demand characteristics of the domain-internal level since the domain itself may be of little significance for the participants. In general, for this kind of Web 2.0-practicies, the reasonableness of what is said may matter only to the

extent that seemingly false claims can make a conversation partner unsure s/he has understood at all (Wittgenstein 1984).

For Web 2.0-practices, such as the distributive construction of a wiki, where the 'outcome' perspective is appropriate along with the perspective of ongoing activity, the demand characteristics of participation are co-defined with demand characteristics concerning the adequacy of the 'entry objects'. Significantly, the 'outcome'-related demand characteristics concretize as demands relating to ongoing participation and possibilities of *doing* something *with* the material: Constructing a wiki is a matter of collecting and refining material with the aim of facilitating its use in future contexts, not a matter of creating a finished product. And *who* produces the material is of minor importance. Copy-pasting a Wikipedia-article without referencing it therefore is a legitimate contribution to the knowledge building of a wiki. The evaluative focus is on future use, reuse and transformative possibilities, not on origins. For this type of Web 2.0-practice, the demand characteristics at the activity-internal context level do not directly counteract those at the domain-internal level. The adequacy – truth, reasonableness, usefulness – of what is said or written counts. Nonetheless, demands of future usefulness and transformative potential delimit relevancy *of* domains and restrict and structure significance of aspects *within* domains. As such, though there is no inherent contradiction between demand characteristics at these two first levels, in practice there may still well be tensions between what is relevant from the domain-internal point of view and what is relevant from the Web 2.0-activity-internal level.

Proceeding to the level of the activity-framing context, the implicit view of knowledge in educational practices leads to quite different demand characteristics, which centre on the acquisition and demonstration of individual knowledge and competence states. The origin of production of *e.g.* a written assignment is very important: From a learning perspective, writing is a learner-centred way of facilitating the acquisition of 'understanding' of the domain in question as well as of the 'style of academic documentation'. From an assessment perspective, written assignments are evidence of the 'possession' of the necessary knowledge and competence 'objects'. Utilizing material produced by others at most displays competence in finding relevant information, which does not suffice to demonstrate possession of 'understanding'. On the contrary, 'possessing understanding' is taken as involving the ability to 'show' the 'object of understanding' by 'formulating it in one's own words'. Material from others must be referenced. Not complying with this is cheating – and stealing – since one takes the 'knowledge possession' of someone else and presents it as one's own.

When introducing Web 2.0 as learning activities within educational practices, these demand characteristics are superimposed on the ones adhering to the activity-internal context level of Web 2.0. This imposition is not a simple addition of demands. Rather, it radically changes the overall complex of demand characteristics which the situation presents to the learner. Activities involving Second Life, for example, are imposed with the demand characteristics of competence 'acquisition' and 'possession', so that participation in Second Life, far from being a goal in itself, becomes a means for acquiring 'knowledge objects' in certain domains. The underlying presupposition is that the domain of communication is important in itself. This is in direct contradiction to the demand characteristics at the activity-internal context level where the significance of domain-internal demand characteristics are reduced because focus is on ways of participating and negotiating identity. Alternatively, Second Life may be employed as a means for acquiring and practicing 'interaction skills'. Still, although the focus then *is* on 'ways of participating', this is understood not as a dynamic situated happening but as a 'skills entity' which the educational practice is to facilitate the acquisition of. Thus, even with this focus, the demand characteristics of the situation changes fundamentally.

As for wiki construction in a course context, the demand characteristics at the activity-framing context level are at variance with the dynamicity, open-endedness, and distributivity of the wiki production. The explicated primary aim of the wiki may well be the possibility of future use of course content in new situations, in seeming correspondence with demand characteristics at the activity-internal context level, but the implicit demand characteristics of the activity-framing context level counteract this aim in practice. The wiki, employed as a pedagogical tool in the course, is primarily an artefact for student production and competence demonstration, *i.e.* for the acquisition and display of knowledge states. Though the material may be put to future use, the demand that it should is not a defining characteristic of the activity. Instead, a basic requirement is that the students themselves participate actively in the formulation of wiki entries. Copy-pasting a Wikipedia-article into the wiki without referencing it therefore is condemned as cheating and is considered detrimental to the very idea of

learning through knowledge construction: It involves no 'acquisition' of a 'knowledge object', but only a more or less mechanical 'passing-on' of the 'knowledge object' possessed by someone else.

4. Web 2.0-mediated competence

Exercising competence in *any* situation consists in acting adequately in relation to the complex of demand characteristics of the situation. The point of the analysis given above has been to show that in practice the demand characteristics of Web 2.0-mediated educational practices are incoherent, because demand characteristics at the three different analytical levels counteract and contradict each other. The consequence, of course, is that students in practice are met with incoherent competence demands. In the examples discussed, the student is required in Second Life at once to participate according to participation-internal evaluation criteria and to do so against the educational evaluative structuring of the domain-internal demands. Alternatively, s/he is required to participate in the sense of partaking in ongoing situated activity in a context where participation is understood as a skill to be possessed. In the case of the course wiki, the student must balance between the demands of participation and collaborative knowledge sharing posed at the activity-internal context level and the demands of individual knowledge possession inflicted at the activity-framing context level. Concretely, s/he is met with the incoherent requirement of authoring entries that display the acquisition of a knowledge state in a context where authorship is renounced and knowledge is understood dynamically and distributively. Contributions to the wiki must be adjusted accordingly, to match at once the conflicting foci of future transformative possibilities and the here-and-now demonstration of 'understanding' of course content for the sake *e.g.* of passing exams.

More generally, in Web 2.0-mediated educational learning activities, the student is required to manoeuvre in a field of interacting, yet conflicting, demands. Put sharply, 'web 2.0-mediated competence' corresponds to the complex ability to respond adequately to the way these conflicting demands actualize in specific learning situations. *Aspects* of this 'complex ability' are constituted by the explicitly formulated learning objectives of reflexivity, communication, collaboration and knowledge construction. But these explicitly acknowledged aspects are framed, delimited and to some extent curtailed by *other*, inherently contradictory, aspects posed implicitly at the activity-internal context level and the activity-framing one. In the words of Biggs (2003), the problem is that because of these inherent contradictions, alignment between learning objectives, learning activities and assessment criteria (implicit and explicit) is not adequately realised in practice.

Web 2.0-mediated competence in this view is not so much the ability to reflect, communicate, collaborate, and construct knowledge in itself – since this 'in itself' is never realized in practice – but rather is the ability to frame and actualize one's network of reflective, communicative, collaborative, and knowledge constructive skills to situational demands set by conflicting views of knowledge and learning and divergent foci of activity. Not the least important aspect of this framing or manoeuvring ability is the skill of attuning oneself to the way *the teacher* (or assignment assessor) in practice incorporates and enacts the incoherent demand characteristics of the situation. *I.e.* to attune oneself to and comply with the expectations, which the teacher has to how a distributive participation-focused, use-oriented, yet individual knowledge state-demonstrating Web 2.0-contribution is to be realized. This attuning oneself becomes all the more complex by the fact that the teacher will not in general have explicated his/her expectations, since the conflicting demands are not explicitly acknowledged, but are posed implicitly in practice.

5. Final remarks

A few final points should be stressed. First, the question may be raised whether it is not the introduction of the Web as such into educational practices, rather than just Web 2.0, which leads to the problems described. After all, as the inventor of the internet, Berners-Lee, has said "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). The technology, he claims, still basically builds on the so-called Web 1.0. And, one might add, the information overload on the internet, the ease with which material of varying quality can be copy-pasted, and the need for students to develop skills in critical assessment and transformative use are all aspects pertaining to the Web as such, not just to Web 2.0. However, the point in this paper is that *practices* have changed and, intertwined herewith, the understandings of knowledge and competence implicit in these practices. And that the incoherent competence demands placed on learners when Web 2.0 is introduced into educational settings result from the tensions between these implicit understandings and the ones inherent in the educational system. This means that even if the

technologies are fundamentally the same and the design visions of the inventors of the Web match what is happening now (which could be contested, cf. Dohn 2009), people are actually acting differently: sharing, collaborating and negotiating meaning on the net in more bottom-up ways than before. In other words, the dynamicity and flexibility of knowledge construction, the renunciation of ownership, the acceptability of appropriation and reuse of material produced by others, and the collaborative/distributive production of material are all central characteristics of Web 2.0-practices in a way which was not actually the case on the Web before, no matter what the inventors envisioned it to be in the then future. Former Web-practices simply did not embody the dynamic, participatory view of knowledge and practice-internal teleology to the extent that Web 2.0-practices do. And for this reason, though problems of information overload and the need for critical assessment skills were present with the internet from the beginning, there was not a comparable clash of conceptions and therefore not the same conflicting competence demands placed on learners. Alignment between learning objectives, learning activities and assessment criteria were in other words not to the same degree fraught with inconsistencies by the very introduction of the activities themselves.

Second, the aim of this paper has been to call attention to implicit and incoherent competence demands which we as teachers in practice place on our students when we integrate Web 2.0 in learning activities. As such, the focus has been on problems we give the students without intending to. However, the upshot of this analysis is not that we should abandon attempts at utilizing Web 2.0 for educational purposes. That would be throwing the baby out with the bathwater, since the motivational, didactic, and learning theoretical potentials of Web 2.0 sketched at the outset of the paper are not negated by the problems raised here. They have, though, been shown to be somewhat complex to realize. The wider implication of the paper should instead be two-fold: Firstly, we as teachers should acknowledge the conceptual discrepancies between Web 2.0- and educational practices and the incoherent competence demands they lead to. This would be a first step towards alignment, in that we thereby explicate the expectations we have, thus not leaving the students blindfolded as to the complex network of competences we expect them to exercise in concrete situations. And secondly, the explication of the incoherent demand characteristics of Web 2.0-mediated learning activities might help us raise the question of whether the educational practices of today are really up-to-date with the flexible, globalized world in which we live. Perhaps the demand characteristics at the activity-framing context level are a consequence of an out-dated view of knowledge and a too narrow focus of activity?

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