Knowledge and Educational Research in the Context of '21st Century Learning'

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Introduction

Tension exists between the call for teachers and schools to rally to the concept of 'twenty first century learning'– and the uncertain place of knowledge. The focus on technology and the shift to the development of competencies rather than the acquisition of knowledge is a characteristic of many contemporary, 21st century–focussed, national curricula. Despite these shifts in thinking about education, there remains evidence of irregular or inconsistent application of these ideas. Furthermore, national education systems continue to struggle to address the uneven educational achievement within education that continue to plague post-industrial nations.

An underpinning question is to ask what should be the key questions for research in the context of '21st century learning'? Knowledge and the concept of 21st century learning are closely related, because the former appears to be under attack by the latter. Schools are in the knowledge business. Similarly, few would disagree that schools are in the business of preparing young citizens to have a flourishing life. Yet, there exist significant tensions in this relationship. This article intends to consider the concept of 21st century learning, and three perspectives on knowledge. These analyses will be synthesised in addressing the research question with the intention of making appropriate suggestions for education research in the 21st century.

Twenty–first century learning

The artefacts and processes of electronic technology and the digital revolution has encouraged global access to the Internet, the number of users growing from under 40 million in 1995 to about 1.5 billion in 2009. The global knowledge economy has greatly digitised work, which has led to increasingly sophisticated consumer demand, and the requirement for commercial responsiveness to these demands. Thus, there is an associated demand for highly skilled 'knowledge workers' able to respond rapidly to change (Gilbert, 2005) and keep pace with the 'codification of knowledge' through constant upskilling in a cycle of lifelong learning (Dahlman, 2002). Workplaces require more independent thinking and innovative 'risk-taking' (Bolstad & Gilbert, 2008; Gilbert, 2005; Warner, 2006). Countries that do not prepare their citizens will not be competitive.

A characteristic notion of twenty-first century learning is the expression of the dual objectives of developing in students the skills, attributes and competencies to equip them for the challenges of future life. These objectives are supported by information communication technology (ICT). Mobile devices place a powerful personal computer in the hands of ever–younger users. The widespread digitisation of, and open access to, high level content gives access to university–level knowledge without ever attending one (Beetham & Sharpe, 2013). No longer does universal, disciplinary knowledge seem as important as the ability to recognise knowledge as incomplete, unsettled, provisional, and culturally constructed to suit the interests and positions of its users.

Attaining the dual objectives of developing competencies and using 21st century tools to enhance learning requires dramatic changes to education and the work of educators. Those changes are argued in a discourse of the inability of traditional educational structures and processes to prepare

students adequately for an unpredictable future. The promise and demand of digital technology is to disrupt the conventional and traditional classroom approaches, leading to a dramatic overhaul of pedagogical attitudes (Beetham & Sharpe, 2013). Teachers must undergo a significant paradigm shift in their thinking about teaching and learning, not least in their approach to, and understanding of, knowledge.

Three perspectives on knowledge

The notion of 21st century learning has implications for knowledge, pedagogy and school curricula. Three perspectives make a contribution to theorists considering a role for knowledge in the context of 21st century learning. The 'emergentist' position on knowledge and schooling is found in several papers co–authored by Gert Biesta and Deborah Osberg. Emergent meaning is more than the sum of its parts, and breaks fundamentally with the place from which it arises (2008). They argue schools continue to be fixated on transmission and enculturation (2007a; 2008). At one level, schools transmit a fixed reality 'out there', while at another, they develop specific human subjectivities (the ideal citizen of the future). They want to understand education as an always–open, always–unfinished process, rather than being an end which is characterised by closure ('I am educated'). The authors caution, however, against 'anything goes' or students learning what they please, emphasising instead their rejection of predetermined outcomes. They view knowledge as probabilistic, which means it has no clear start or end point (2010), thus predicting outcomes is impossible. Thinking about knowledge in this way allows for a creative process with a multitude of possibilities. Knowledge is the meaning that arises from interaction between teacher, student and curriculum. This interaction ought to focus on the possibility of changing the world. New knowledge transcends and therefore calls into question the knowledge that preceded it. Having these constructivist views on knowledge leads then to the notion of a 'pedagogy of invention' (2007b), which is focussed on a future that cannot be predicted. Pedagogy must focus on engagement with the curriculum, which is "dynamic, self–renewing and creative" (Osberg, Biesta & Cilliers, 2008, p. 225). Of the three perspectives presented here, the strength of this one is its rejection of rigidly defined outcomes, though its proposal of knowledge as radically open–ended and unpredictable makes it the least attractive.

Social realists of education express their concern for the future and status of knowledge, at both school and higher education levels. The question of knowledge ought to be "centre stage in thinking about education" (Moore & Maton, 2010, p2). Knowledge is socially constructed and produced, and its processes of acquisition and transmission are complex. Importantly however, cognitive interests are independent of social interests, leading to a distinction between epistemic or disciplinary knowledge and social knowledge. Social realists critique the influences of both the Left and the Right on the education system (both schooling and higher education). The latter has an incoherent socio–economic programme, characterised by rampant credentialism and credential inflation in the labour market, supported by corresponding adaptations of the school curriculum (Moore, 2007). The resulting curricula replace knowledge with key competencies, skills, and statements of values, perpetuating a discourse of the flexible individual capable of contributing to the knowledge economy. Rata (2012) challenges the Left, accusing it of fuelling the 'cultural turn' and abandoning class analysis as a consequence, taking up instead identity (standpoint) politics. Standpoint discourses reject theories of knowledge, claiming that experience, not expertise, is important, that

knowledge depends on time and place, and that there are multiple versions of knowledge. Young (2008) accuses these discourses of "intellectual dishonesty" (p. 16), damaging to those already marginalised. Knowledge is a mind–independent (thus real) product of social relations (thus social). Knowledge is fallible, though there is better knowledge, and less valuable knowledge (Young, 2012; 2013). It is mediated by communities of disciplinary enquiry that subject it to critical scrutiny by rules or procedures governing the acquisition, growth and development of knowledge in that field (Rata, 2012; Young, 2013). Young refers to 'powerful knowledge', which is characterised by qualities of both specialisation and generalisation. It is specialised because clear boundaries exist between it and other forms of knowledge, and because the places where it is acquired and disseminated are specialised (such as universities and schools) (2013). Powerful knowledge has certain generalising features, and Young (2013) gives as examples, Kant's categorical imperative, the emotions expressed in literature and the arts, and the knowledge of history, geography, and social sciences. Rata (2012) emphasises the centrality of concepts. Social realists challenge progressivists and constructivists. However, Rata condemns "the mindless bullying of the boring classroom" (2012, p. 10). Social realists claim a clear distinction between pedagogy and the curriculum, arguing that they are conflated in schools by privileging student experience (Moore, 2007). Schools are a place to develop thoughts and intellect by coming to grips with concepts, not experience (Young, 2010).). It is a matter of social justice for social realists that pedagogy focuses on delivering a curriculum, based on powerful knowledge, to all children, extending their social experience (Rata, 2012; Young, 2010). Social realism makes a persuasive case for the social justice inherent in ensuring access to the cultural capital of the dominant classes. The weakness of this perspective is the difficulty it has in avoiding the charge that it is a conservative reaction to educational change.

The third perspective on knowledge is represented here by the work of Jayne Gilbert and Rachel Bolstad, well–established New Zealand education researchers, who see their work being increasingly focused on futures research. Working from an explicitly postmodernist perspective (Gilbert, 2005), the dramatic impacts of the knowledge economy and the digital revolution on education systems are taken very seriously. Schools and teachers are urged to make a paradigm shift, and importantly, ways must be found so system–wide changes occur bringing schools and the 'public' (Bolstad & Gilbert, 2012) to view knowledge and pedagogy differently. Schooling is critiqued for upholding an industrial–age approach to education. What is required is nothing less than system–wide deconstruction and 're–bundling' (2012) of conceptions of knowledge, learning and teaching. The existing system does not cope with non–standard students. The modernist emphasis on education for egalitarianism and autonomy are to be abandoned for a politics of difference that accentuates diversity. The challenges associated with the knowledge economy and 21st century learning ideas do not, however, necessitate the abandonment of knowledge; rather what must change is a notion of knowledge as a product to one that regards knowledge as a problem–solving process. Understood as a verb rather than a noun (2012), knowledge is not 'stuff' (content) but that which "*does* stuff" (2012, p. 31. Emphasis in the original). Debates about teacher–centred and student–centred approaches must be set aside in preference for thinking about pedagogy and the relationship between teachers and students in terms of collaborative 'learning networks' and 'knowledge building' (Bolstad & Gilbert, 2012). New power relationships will be required, where the 'student' becomes the 'learner', and the traditional 'teacher' becomes the 'facilitator' or 'learning manager' (2012). Learners internalise new approaches to knowledge, learning and their relationships with others; they actively seek to become and behave as different people as a result; this new learning

and desire results in adults who will be active, lifelong learners, connected to their communities and networks (2012). Key competencies are the vehicle for this dispositional shift. The strength of this perspective is its strong position on the imperative for the dispositional shifts demanded of teachers and schools to accommodate futures education. A further strength is its recognition that disciplinary knowledge continues to be important. Its weakness is its ready acceptance of a neoliberal, economistic vision for education in the 21st century.

Key questions for research in the context of 21st century learning

Is knowledge threatened or devalued by a curriculum focus on key competencies?

The knowledge economy rewards those who are better educated and more highly skilled. There is no longer place for low skills but rather a focus on thinking problem-solvers who are far more critical to businesses than previous industrial-age workers (Gilbert, 2005). This is a vision of competencies linked to the development of human capital for the knowledge economy. A leading collective voice in the international policy effort to make this shift is the OECD. The vocational emphasis characteristic of the competencies is driven b`y the demands of the knowledge economy (Gonczi & Hager, 2010; Stasz, 2001). Employer requirements are focussed less on academic competencies (based on acquisition of knowledge content), and technical competencies (based on job–specific skills), and more on generic or 'soft' skills, such as communication, problem–solving, teamwork and cultural integration (2001). Given the influence of the OECD over its members, it unsurprising to find key competencies prevalent in such national and state curricula as New Zealand, Australia, United States of America and Canada.

The place of key competencies in curricula, by virtue of their basis in vocational skills clearly challenges knowledge, possibly the mainstay of pre–21st century education. What might the response of the three perspectives on knowledge be to this challenge? Osberg and Biesta (2008) have more interest in the meanings that evolve from pedagogical encounters, than theorising about the individual learner (and teacher) as some kind of object that brings about educational outcomes, which is precisely what is intended by the notion of competencies. Social realists reject the concept of key competencies as a feature of a vocational model that has been imposed on schooling by modernisers. Bolstad and Gilbert (2012) embrace key competencies, seeing them as a logical element in shifting discourse from education to learning, with a focus on individuals having the capability and capacity to deal with an uncertain and complex future.

Does a social constructivist paradigm necessarily dismantle disciplinary knowledge?

Social realists believe that knowledge arises from social contexts, and argue that constructivism conflates the knower with the known by reducing knowledge to the situated experience of the knower. The emergentist argument takes up a social constructivist position, claiming that something new and previously unimagined will arise from the pedagogical event (Osberg & Biesta, 2007b). Bolstad and Gilbert deploy the concept of 'knowledge–building' activity as the focus of pedagogical activity (2012). Although constructivist in orientation, their position does not abandon disciplinary knowledge, as already noted, seeing it as a context for the transformation of knowledge that occurs in 'knowledge–building'.

Following social realists, a distinction will be made here between pedagogy and knowledge, or more specifically, between pedagogy and what is deemed important to engage learners in. The latter is typically what ought to be found in a curriculum. This important pedagogy–knowledge relationship requires further clarification. Pedagogy has a narrow and a broad meaning, which will be referred to here as school knowledge and educational knowledge. Teachers acquire *school knowledge* through a process of education and experience. It consists in both what is taught and learnt, and how it is taught and learnt, and is traditionally the vehicle employed by a qualified practitioner to enable students (and indeed even the teacher) to achieve understanding or insight and skill or competence in relation to social and disciplinary knowledge. In its broader sense, pedagogy as *educational knowledge* refers to the theoretical beliefs and consequent actions of teachers across a range of educational and pedagogical issues (such as cognitive, emotional and moral development; the relationship between school and society; the teaching and learning process; and the purposes of education). This knowledge is rather more significant to the practitioner than to the student.

The challenges presented by the digital wave include finding new ways to engage both learner and digital affordances, requiring teachers to reconceptualise the exchange between teachers and students. Teachers are thus confronted in regard to both school knowledge and educational knowledge, as they have to reappraise *how* to teach and thus have to ask *why* they ought to teach this way. This does not however appear logically to entail an abandonment of disciplinary knowledge, as social realists claim. As Bolstad and Gilbert (2012) and Gilbert (2005) suggest instead, students must still learn *something* to engage with, modify and transform–not in itself a particularly new idea, as any reading of the work of Paulo Freire will attest..

> *Does the focus on 21st century learning address the on-going issues of uneven educational achievement in post-industrial society?*

Apart from the policies put in place to address on–going disparity, what direction is provided by research to suggest a way forward in the 21st century? Osberg and Biesta (2010) note a conundrum faced by inclusive education: the more inclusive education seeks to become, the less inclusive it is in principle, because those demarcated as 'different' or excluded are being included in a system that has pre–established outcomes based on a dominant culture. In this sense, 'inclusive education' is "a method of annihilating difference and diversity in the interests of inclusion into a one-dimensional society"(p. 594). The solution they argue, is that the curriculum must become an opportunity to constantly critically reflect on the relationships among people in the world in the process of offering open choice.

Social realists argue that over–focussing on the achievement of personal potential through radical constructivism (all children are scientists), benefits those invested with dominant cultural capital, and fails those who are marginalised. The solution is to have clear distinctions between curriculum and pedagogy, and to be committed to specialised, differentiated bodies of knowledge (Young, 2013).

Bolstad and Gilbert (2012) specifically dismiss thinking about the problem of underachievement in terms of 'inequality', which they regard as evidence of 20th century, industrial, undifferentiated thinking based on deficit concepts that pathologise underachievement. Futures education should actively pursue the development of diversity across two fronts, namely in relation to culture, and knowledge or ideas. The former is the preparation of individuals to be cosmopolitan citizens. The

latter assumes success in the 21st century to hinge on students not only having access to past knowledge and paradigms, but being invested with "the ability to think between, outside and beyond them" (p. 25).

Critical considerations

Global finance and multinational capital continue to have a dominating influence on education, as seen by the influence of key competencies on national curricula. Early evidence cited by Stasz (2001) suggests that key competencies prioritise employer requirements in education, above, for instance, the development of important democratic and critical dispositions, or the intellectual rigour that comes from academic study (or at least a focus on knowledge). Before concluding however that the shift to key competencies necessarily erodes knowledge, it should be noted that the outcome of the OECD work on key competencies (cited earlier) was a model consisting of three main categories of competencies that can be imagined as a Venn diagram: interaction in socially heterogeneous groups, using tools interactively and acting autonomously. At the point of intersection between the three sets is critical and reflective thought (2003). Closer analysis of these categories, notably 'using tools interactively', highlights the importance of acquiring knowledge and sophistication in the use of ICT and the linguistic codes of literacy, numeracy and science. The underpinning of the model with critical and reflective thought opens possibilities for the development of a social justice and democratic perspective. Developing this perspective from academic study alone (the acquisition of knowledge for no other reason than for its own value) is unlikely to lead to meaningful social action (or action in social contexts by agents), whereas a focus on interaction in socially heterogeneous groups, combined with academic study underpinned by reflective and critical thought, can be extremely relevant.

There is nevertheless a further line of critique to consider. Stasz has suggested that a one–to–one match of competencies to workplace is not credible (2001), as each workplace context is unique (Gonczi & Hager, 2010). More recent work has led Lauder, Young, Daniels, Balarin and Lowe (2012) to the view that there is not a direct link between increased skills, competencies and qualifications and increased mental or material rewards in the workplace. The reality of the labour market is dull, routinised, digitised jobs, and not creative jobs and networked teams envisaged by 21st century learning advocates.

Conclusion

This article will be concluded with some assertions about the role of knowledge, followed by some suggestions for further research questions that are suggested by the analysis of key questions for research in the 21st century. This article has endeavoured to assert a rejection of the discourse that knowledge is no longer important in 21st century. A more likely position on knowledge held by those writers cited here, as representative of a futures view, is that knowledge is radically unsettled and is relevant only if produced by the user of knowledge for that person's ends. Taken too far, this instrumental constructivism does indeed erode disciplinary knowledge. This too is rejected in favour of the view expressed by Rata (2012), who has argued persuasively that knowledge is the result of intellectual labour in a social context from which the knowledge product becomes separated. Knowledge production replicates other forms of production: it has a material basis, it consists in means and processes of production, and its relations of production are evident in the communities

of scholars who validate the concepts, principles and content which are the result of this symbolic production.

This article has presented three perspectives on knowledge in support of the consideration of whether there is a role for knowledge in futures education. These perspectives have been deployed in considering what have been suggested as core questions for education research. To end, some questions for continued research in this area will be suggested. The link between key competencies and knowledge suggests first the requirement to examine more closely the alleged or asserted linear relationship between the demands or requirements of the workplace in relation to school leavers and graduates; second to inquire into the scope for using the key competencies to develop more considered democratic and critical dispositions, supported by a knowledge base.

Concerning the role of technology in shaping social constructivist paradigms it is claimed that critical and reflective thinking are encouraged and deepened by engagement with technology (Beethham & Sharpe, 2013; Bolstad & Gilbert, 2012). This claim demands closer scrutiny, particularly in relation to the quality and characteristics of thinking associated with this engagement. Relatedly is the claim that the confrontation of teachers' educational knowledge (the rationale for their pedagogical activities) entails a significant development of their critical and reflective thought. Further lines of enquiry should seek to establish ways in which disciplinary knowledge is adapted and modified in relation to new approaches to pedagogy that utilise the affordances of technology. Following the emergentist perspective, the question may also be asked of the impact of these affordances on the nature and quality of the pedagogical relationship and the meanings that emerge from this relationship, now infused with technology.

Finally, the question of educational disparities is not resolved. Going forward, questions should be asked of the emphasis in futures education discourse on the radical personalisation of learning–indeed, on the emphasis on 'learning', as opposed to 'education', which Biesta (2013) has drawn attention to–and its claims to better preparing the young for an uncertain future. It will also be important to examine the effects of increased (and increasing) participation rates in tertiary study on both individual job prospects and the evolving digital economy.

These questions are raised in the spirit of critical research. They do not presuppose the researcher as one whose task it is to focus on supporting policy–makers or the state, nor do they assume that the role of researcher is to market ideas to the public at large. Both kinds of researchers exist in abundance already. Rather, in this case, emphasis is placed on the researcher as knowledge–builder, whose task it is to clarify and deepen a collective understanding of the knowledge already present, to subject it to critical scrutiny and in so doing, to further build knowledge of the kind that will deliver a socially just and democratic society.