education review // reseñas educativas
editors: gene v glass gustavo e. fischman melissa cast-brede
a multi-lingual journal of book reviews

August 3, 2010 Volume 13 Number 10 ISSN 1094-5296

On Uncertainty, Doubt, Responsibility, and Perpetual Journeys: An Essay Review of Two Books by Ole Skovsmose

Peter Appelbaum
Arcadia University

Skovsmose, Ole (2005). *Travelling Through Education: Uncertainty, Mathematics, and Responsibility*. Rotterdam: Sense Publishers.

Pp. 244 ISBN 90-77874-03-8

Skovsmose, Ole (2009). *In Doubt – About Language, Mathematics, Knowledge, and Life-Worlds*. Rotterdam: Sense Publishers.

Pp. 157 ISBN 978-94-6091-026-5

Citation: Appelbaum, Peter. (2010 August 3) On Uncertainty, Doubt, Responsibility, and Perpetual Journeys: An Essay Review of Two Books by Ole Skovsmose. *Education Review*, *13*. Retrieved [Date] from http://www.edrev.info/essays/v13n10index.html

> "The critical nature of mathematics education represents a great uncertainty. Naturally, it is possible to try to ignore this uncertainty. This can, for instance, be done by assuming that mathematics education somehow can become 'determined' to serve some attractive social functions when organized in, say, a national curriculum crowned by some well-chosen aims and objectives. But I find this to be an illusion. The functions of mathematics education cannot be determined (or re-determined) by introducing some overall guiding principles put at the top of the curriculum. To change the 'indeterminism' of mathematics education is not a simple task. There are no straightforward procedures for 'determining'. The functions of mathematics education might depend on many different particulars of the context in which the curriculum is acted out. To acknowledge the critical nature of mathematics education, including all the uncertainties related to this subject, is a characteristic of critical mathematics education." (*Travelling,* p. 44)

This quotation from Ole Skovsmose's *Travelling Through Education* is an excellent summary of much of his life's work so far, and at the same time it provides a good example of what Skovsmose calls an "explosive concept" in *In Doubt,* another recent book. Critical Mathematics Education is itself an "explosive concept," an idea for which any attempt at clarification relates to apparently even more complex and broader concepts and perhaps even less clarification than the original concept itself. As he has done in numerous other publications and presentations, Skovsmose attempts to respond to the explosiveness of his intellectual focus through storytelling about specific classroom contexts. Other such open, explosive concepts, just to give a few samples, might be reflection, intention, and political action. Skovsmose usually takes a philosophical approach to clarifying his terms, in order to better understand what it is possible to talk about, and what it is possible to achieve. Because of this, his books work

as well as provocations to comprehend more deeply the possibilities for mathematics education in particular, and education more generally. Mathematics education has a long history of being taken as politically and ethically neutral, far removed from issues of social justice and personal meaning. The

overarching hegemonic assumptions about mathematics make it extremely difficult to begin explorations of a genuinely critical mathematics education. The library of Skovsmose's writings has done a great service in the past toward helping people confront their presumptions about how mathematics works in this hegemonic structure. Before we can even begin to work together on a critical mathematics education that would serve democracy, social justice, or any other of our "intentions", however they too might be comprehended, there is the problem of creating an audience for this work. Most mathematics educators plow ahead with little thought to how their efforts may or may not be consonant with their personal convictions. These latest two books first enable us to amass the historical trajectory of philosophy and social thought that allows the questioning of the role of mathematics in perpetuating misperceptions about the self-perpetuating dynamics through which mathematics as possibly inappropriately conceptualized reinforces the initial problematic assumptions in the first place. They then help us join Skovsmose on the travelling road through education where "a clarification of 'something' brings us to consider 'everything'" (*Travelling*, p. 216).

Once he has helped us collect the tools and words to articulate the potentially problematic as well as potentially revolutionary possibilities for mathematics and mathematics education, Skovsmose can move us ahead into other discussion. Mathematics education is no longer assumed to possess any essence, and critical mathematics education is now able to concern itself with the different possible roles that mathematics education might play in a particular socio-political setting. For example, critical mathematics education might be concerned with the ways that mathematics education might be stratifying, selecting, determining, and legitimizing inclusions and exclusions. It would also concern itself with the possible different routes that processes of globalization might take. Furthermore, critical mathematics education can now address the nature of those competencies that mathematics education might support. Knowledge and power are connected, not least with respect to mathematics. Learning, and learning mathematics in particular, could mean empowerment. But it could easily come to mean empowerment for *some*, as the education process produces both inclusion and exclusion. In this respect, Skovsmose argues that critical mathematics education must be aware of the students' situation, and consider what background the students have, "background" itself one more explosive concept. At the same time, critical mathematics education as practiced by critical mathematics educators should also be aware of what possibilities for the future a particular society might provide to different groups of students. A way of establishing this awareness is to consider not only the background of the students but also their "foreground". This will open the routes for a more direct consideration of how different societies provide opportunities (or the opposite) for different groups, depending on gender, age, class, 'race', economic resources and culture.

While most educators take a received mathematics as the "content" of school practice, mathematics as a school subject and

as a collection of cultural practices represents a concern for critical mathematics education. Mathematics itself must be considered, and not only from an educational but also from a philosophic and sociological perspective. Mathematics represents an important aspect of the development of rationality or 'reason'. It represents a huge variety of cultural techniques integrated in handcrafts, daily life routines, science, technologies, economy, business, industry, and military efforts all over the world. Furthermore, mathematics itself appears to represent a particular aspect of globalization through which some practices are reduced in status to "native" or "indigenous" knowledge as contrasted with "school" or "legitimized" knowledge, reinforcing social inequities that circumscribe "local" versus "global" or universal knowledges; Skovsmose refers to these processes as "ghettoizing".

In order to more fully interact with the complexity of mathematics and globalization, and to respond to the current state of ghettoizing practices, Skovsmose introduces the notion of "Mathematics in action," by which he means a variety of techniques and technologies that in combination define both our information society and establish sites for discussing power-knowledge structures in our contemporary society. On the one hand, we might want to re-think the nature of mathematics and mathematical thinking. On the other hand, we can identify significant features of mathematics and mathematical thinking and use them to challenge the assumptions of modernity and post-modernity through a sort of Wittengensteinian study of mathematics-in-use; such work in turn might fundamentally "define" mathematics in action as the very meaning of mathematics. For example: By means of mathematics, we can represent something not yet realized and are in this way able to identify alternatives to a given situation. This is not necessarily unique to mathematics, but it is a particular feature of the discipline. It provides a sort of freedom to imagine possibilities by generating sets of hypothetical situations. In this sense, mathematics is often a resource for specifically *technological* innovation and for technological planning processes that develop algorithms for decision-making, thus implicating mathematics in the hidden, implicit functioning of many aspects of contemporary society. Here we have both a defining feature of mathematics as typically practiced by many people in the world, and as implicitly experienced through everyday technologies by even more people in the world. This feature of mathematics gives us something to consider as a focus of critical mathematics education, both theoretically, as we question the socio-cultural practices of mathematics and how they relate to our professional work in terms of our commitments to equity, and as fodder for curriculum development. Regarding the theoretical focus, should we not question the ways that such technologies as scantrons, personal smartphones, medical diagnostic systems, social welfare algorithms and any other everyday uses of technologies perpetuate assumptions about the role of mathematics in defining knowledge and neutral applications of technology? Regarding the fodder for curriculum development, Skovsmose provides interesting examples of

ways that students can learn both traditional and more critical mathematics at the same time through the interrogation and exploration of such technologies and technological forms of decision-making. While some might dismiss the examples as mere advocacy of project-based investigations, the specific examples do much more than illustrate imagined classroom practices. They help us understand how learners can develop a critical understanding of the mathematics as a primary intention of the experienced curriculum, with the development of skills and conceptual knowledge embedded within this critical perspective in ways that are fundamentally distinct from what we might label 'acritical' or 'noncritical' mathematics education.

When Skovsmose discusses mathematics in action, he wants us to analyze how mathematical conceptions are projected into reality. When we use mathematics as a basis for technological design, we create a technological device that has, somehow, been conceptualized by means of mathematics. In some sense, it had been anticipated in the world of mathematics; later it is brought into reality by an actual construction. Yet he also declares that it is not possible to transpose the attractive qualities associated with sociological imagination to technological imagination. Any technological design has implications not identified by hypothetical reasoning. This is a basic problem related to any kind of mathematically based investigation of counterfactuals. The implications of the realized situation (which is certainly different from *p*), might be very different from *q*, the calculated implications of *p*. Any hypothetical reasoning can lose all credibility when it drops into the similarity gap, which could always open when mathematics is brought into operation. (It is only in the 'well-protected mathematics classrooms' that this gap does not appear, as the virtual reality of the exercises fully defines the problems to be solved.) What we tend to do, as we live in our mathematically-influenced, mathematically generated, and mathematically-devolved life-world, is to blame a model when it fails, rather than to appreciate the model and at the same time understand the ways that models and representations become part of our reality: "Mathematics supports the modulation and constitution of a wide range of social phenomena, and in this way mathematics becomes part of reality." (*Travelling,* p.90) We live in an environment that integrates a model-supported virtual reality with an already constructed reality in a formidable mix. Thus, much information technology materializes in 'packages'. Such packages can be installed and operate together with other packages, and they contain mathematics as a defining ingredient. The rational turns real, although nothing indicates that the real turns rational. The constructors of the model seem to clarify some decisions made with reference to the model, but could claim to have nothing to do with the political decisions made with reference to the model. The person constructing and managing the model cannot be held responsible for the political decisions based on the model, and the political decision-makers can refer to the experts and to what the numbers are telling them. In many cases the operations of the model can be *kept at a convenient distance* from the implications of the model-based actions. The implications of

the model-based actions disappear beneath the vanishing point of moral visibility. This is also an aspect of the way mathematics helps us to set the scene for decision-making.

When we consider mathematics in action, we consider actions. And actions cannot be assumed to have a special value, quality, reliability, or trustworthiness because mathematics is involved. This brings Skovsmose to the paradox of reason: On the one hand, mathematics as a part of science seems to represent the most refined form of knowledge. We see the history of mathematics as intimately connected to a most impressive development of human knowledge and understanding of nature. Skovsmose suggests that we do not try to consider mathematics as a structure, nor that we take mathematics in turn as a well-defined system for modeling, but instead that we comprehend mathematics as part of a more complex system of resources. If we want to understand how science is operating in today's society, we have to consider how the apparatus of reason is operating. Such a broad view would not provide any solution to the paradox of reason, but it might help us illuminate the paradox. If reason cannot be trusted, a critique of reason seems necessary.

"Paradox" is another concept central to Skovsmose's work. He has published widely on *aporia*, recovered from Plato's examination of the fundamental irreducibility and undecidability of an idea, and Artistotle's examination of puzzles arising from two or more acceptable beliefs. As part of this long intellectual tradition, *aporia* is not a state to overcome in order to reclaim certainty (whether through reason, force, or other means), but rather an opportunity to ask new questions, to view things differently, and to create new ways to understand our situation as we feel we are working in important, useful, meaningful, or otherwise powerful and personally fulfilling ways. In *In Doubt,* Skovsmose writes that it is not so much that we can no longer find truths. The 'problem', he says, is that "we can easily be overloaded with truths."

One is not really doing anything by simply stating a truth. 'Truth' is a most uninteresting thing … Interesting truths emerge only in the process of searching or in response to some preoccupation. Interesting truths are linked to a perspective. A truth without a preoccupation or a perspective is not really anything worth mentioning. (*In Doubt,* p. 103)

Skovsmose himself is preoccupied in these most recent books with how our life-worlds are fabricated by mathematics education. By considering mathematics as performance, he argues that we must address how mathematics establishes things for us, how mathematics can be overburdened with presumptions; our ways of seeing, ways of ignoring and ways of open entry into and through our world is at least partially structured by mathematics and mathematics education. In this sense, mathematics provides strategies, forms part of our decision-making processes, and serves significant roles in the cultural apprenticeship that defines our tastes and values related to reality and sense-making, establishing contingencies and sculpting objectivity. It seems curious to me that one might argue for such a powerful, global influence of

mathematics and mathematics education at the same time as interrogation the sorts of ghettoizing and stratifying practices of inclusion and exclusion that lead to so many people being completely excluded from much of the concepts and reasoning modes that mathematics promises. This is of course part of the *aporia* that Skovsmose addresses; yet it also raises the question of whether or not we are self-aggrandizing in our presumptions regarding the importance of mathematics education, something Skovsmose also notes at the end of *Travelling*. There is the Foucauldian notion that professional practices such as mathematics education are self-perpetuating, creating problems and practices that are self-serving in constantly recreating the need for the profession's collection of expertise.

Nevertheless, assuming our work has some importance, at least to us and the people with whom we interact, if not on a grander scale, and there are indications that mathematics education does leave some sort of imprint on our life-worlds, then we should accept that mathematics education can be disempowering or empowering. It has the capability of collapsing into rigid forms and supporting problematic features of any social development. It might also, on the other hand, contribute to the creation of a critical citizenship and in this way support democratic ideals. The socio-political roles of mathematics are neither fixed nor determined. In this sense, Skovsmose labels mathematics education as being "critical"; it is also in this sense that mathematics education is a bundle of *apories*. Critical mathematics education is no longer, and never was, what some conceive, that is, it is not a field of progress or scientific identification of excellence or networks of best practices, or means to ends; to work in mathematics education, as a critical mathematics educator, is to become preoccupied with challenges that are evoked by the critical nature of mathematics education. In this manner, those who work as critical mathematics educators approach their efforts from a particular standpoint. This standpoint directly or indirectly examines the ways that processes of globalization and ghettoizing frame mathematics education. It explores the meaning of going beyond modernity and post-modernity. It constructs mathematics as "mathematics in action" and includes within this construction a need to be concerned with power and knowledge. These characteristics of the critical standpoint moreover reflect the *aporetic* uncertainty regarding the possible socio-political functions of mathematics education that compose the critical nature of mathematics education itself. And it is this seemingly double-*aporia*, this recursive, self-reflexive *aporetic* quality of explosive concepts and the explosive concept of mathematics education in particular, that sets up the 'true' complexity with which we are working: as a hegemonic form of structuration, mathematics education cannot be escaped; it not only defines our world and fabricates our objectivity, but *is* in fact our life-world. To work on these issues is akin to jumping off of our Earth in order to better understand what life on Earth entails – for one thing, we might not be able to survive the process of such research.

So, what are we to do, then? Skovsmose suggests we take the very *aporetic* nature of critical mathematics education as our focus:

Enlightenment would presume a connection between knowledge and progress, setting up false expectations that our work make a difference in particular ways. We would be able to assess our efforts according to criteria of progress. Our *aporetic* situation implies that no foundation formed by any critique of reason (in the shape of an apparatus of reason) can be found; nor can we escape the requirement of such a critique. Skovsmose says this makes him struggle with the following question: "How is it possible to build up a conceptual sensitivity to the sociopolitical functioning of mathematics education, as well as to the operations of reason in general?" (*Travelling*, p. 214) In *Travelling*, he suggests nine preoccupations that can support this: *mathematics, knowledge, reflection, learning, learners, conflict, mathemacy, ghettoizing,* and *globalization*. In *In Doubt*, he turns to language itself, suggesting that these nine terms and others would thus carry provocative weight in a semiotic system of life practices, pointing to the conclusion that to clarify any one of these is explosive, pushing an examination of any one "thing" into the consideration of "everything". The seeming impossibility of such work is made less overwhelming by the end of *In Doubt*, in which Skovsmose evokes the phenomenological concept of *epoché,* suspending forms of knowledge and presumptions, bracketing out direct perception in order to study perception itself. If we take mathematics and mathematical modes of being and thinking as significant features of our life-worlds, then we can, in phenomenological terms, acknowledge the apparent desire for establishing foundations, but also move into the kinds of work that ask us to reflect on particular aspects *of* our life-worlds, and to do this from *within* our life-worlds.

And it is here that we might begin our own journey with Ole Skovsmose: at the study of our life-worlds, which are so rich in uncertainties. Skovsmose discusses how our life-worlds are "floods of uncertainties"! And, in this sense, these floods of uncertainties lead us to the issue of *responsibility*. Indeed, this is the existential question evoked by uncertainty: what do we *do*? We are condemned to act in the face of uncertainty, that is, we *must* take responsibility for what we do given what we know and can think about.

I first met Ole Skovsmose in Berlin in 1989. He was a relatively young scholar with provocative ideas, and he had come to Christine Keitel's seminar to share some of his earlier work on mathematics, technology, and democracy. Even then, traveling and sharing his ideas across cultures was a key aspect of his intellectual efforts. I, too, was a traveler, a U.S.-American carrying out dissertation work on the discourse of mathematics education while living in Berlin. I immediately sensed the importance of this man's spadework in critical mathematics education for my own inchoate professional commitments and curiosities. I have followed his work closely through the years, and would like to recommend these two latest books as a very welcome, accessible introduction to many of his ideas. What struck me at that first meeting, as we had coffee sitting on the grass outside the Technische Universität, was the humility and piercing curiosity that Skovsmose demonstrated; he wasn't about

showing how great he was, but instead truly welcomed cross-cultural dialogues as a form of self-critique. At the time I felt as if I finally understood what some anthropologists meant by the notion of anthropology as critique. Our conversation did not lead to either of us becoming an object of study for the other; we were immediately caught up in a web of I-Thou interactions, looking together at and with mathematics and mathematics education as a process of developing, thinking about and understanding questions. I believe Skovsmose's writing had always had a taste of such conversation as well. Each has extended the metaphor of traveling in and through education while traveling in and through the world that now has become the title of one of the two books reviewed in this essay. After reading these two books, if you are cajoled into further reading, you can use the bibliographies to find previous articles and books that he wrote while traveling elsewhere throughout the world, through Europe, Africa, and Latin America.

There is something to be said about the results of a new post-colonial mathematics education that has emerged thanks to scholars like Skovsmose who have spent significant amounts of time collaborating across national and cultural borders, scholars who have carried out these collaborations while preoccupied with issues of equity and imperialism. There remains within most national mathematics education communities a strong inward gaze that ignores the kinds of insights that might be gained through global 'critical mathematics education' work. Even as some researchers and practitioners attend international conferences such as ICME (International Congress on Mathematics Education), CIEAEM (International Commission for the Study and Improvement of Mathematics Education), PME (Psychology of Mathematics Education), etc., presentations and discussions at these conferences are stuck in the quagmires of enlightenment ideologies and progressivist discourses, and typically ignores issues of globalization, ghettoizing, implicit mathematization, indeed most of the nine nodes of critical mathematics education discourse that are at the heart of Skovsmose's life's work. This is not to suggest that his work has had little influence! We should instead say that he and a few others have managed to create the field of critical mathematics education. I receive these two books as a celebration of that success. Stories he tells provide examples of international and cross-cultural comparisons, along with types of personal and analytic reflection that might accompany or grow out of such collaboration. The two books reviewed here are an excellent start on a canon of this subfield, collecting intellectual traditions, personal reflections, and stories from practice that anyone new to critical mathematics education can use as an introduction. For those of us who have traveled virtually with Skovsmose throughout his career, there is also much to be gained from these new works. For one thing, they are less expensive than some of his classics, such as *Toward a Philosophy of Critical Mathematics Education*; they also include fresh summarizes of many of the ideas that he has written about in various articles throughout the years, making it easy to think about those issues all together within a coherent update of his thinking.

About the Reviewer

Peter Appelbaum is Professor of Mathematics Education and Curriculum Studies, and Director-at-Large of Undergraduate Curriculum, at Arcadia University, in Philadelphia, USA. His recent publications include *Embracing Mathematics: On becoming a teacher and changing with mathematics* (Routledge 2008) and *Children's Books for Grown-up Teachers: Reading and writing curriculum theory (*Routledge, 2007).