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Critical Inquiry into STEM Education

Abstract: In this chapter, we offer a detailed, rigorous inquiry into STEM education policy that uses philosophical methods resting primarily on the philosophical categories: axiology, ontology, and epistemology. In a deep exploration of the what, why, and how of STEM, we employ a unique approach rooted in the work of philosopher Alain Badiou. To begin, we review his writings on mathematics and set theory in particular, as this will launch our exploration. After which, we detail our approach in selecting and analyzing STEM policy documents. The inquiry and analysis reveal the revolutionary potential in STEM education, something that might not be intended by policy but exists nonetheless.

Keywords: Alain Badiou; ontology; philosophical method; set theory

In this chapter, we offer a detailed, rigorous inquiry into STEM education policy that uses philosophical methods resting primarily on the philosophical categories introduced and discussed in the previous two chapters: axiology, ontology, and epistemology. In a deep exploration of the what, why, and how of STEM, we employ a unique approach rooted in the work of philosopher Alain Badiou. To begin, we review his writings on mathematics and set theory in particular, as this will launch our exploration. After which, we detail our approach in selecting and analyzing STEM policy documents. This reveals the revolutionary potential in STEM education, something that might not be intended by the policy but exists nonetheless. Such potentiality sets us up for the final chapter in which we detail an alternative STEM education.

### 3.1 Alain Badiou

A contemporary French philosopher writing today, Alain Badiou provides work that is highly useful for understanding the political climate in education, especially in STEM. Badiou’s corpus is enormous and is only beginning to gain momentum in influencing the English-speaking philosophical community. As his many volumes of books and essays get translated into English, Badiou’s unique philosophical pose and theoretical thought continue to stimulate modern philosophers working in various fields, one of which is philosophy of education (e.g., 2003, 2005a, 2005b, 2006, 2008). His work is most recently being utilized in theorizing revolutionary ideas in education (e.g., Barbour, 2010; Brown, 2010; Clemens, 2001; den Heyer, 2009; Hallward, 2006; Lehman, 2010; Lewis and Cho, 2005).

Badiou’s work is particularly well suited to STEM policy analysis; first for the attention he gives to mathematics. One of Badiou’s most famous statements is that “mathematics is ontology,” or more specifically, mathematics is the only discourse that can think ontologically (Badiou, 2005a). In this section, we review what Badiou means by this, focusing on his assertion of being as a multiplicity. This leads to studying the nature of things, as Badiou argues via set theory. Taken as a whole, these considerations set forth the important role that mathematics, and thereby STEM, education can play in transforming society. In particular, this involves re-framing mathematical thought towards aesthetics. This section largely deals with mathematics and not the other content areas of