Understanding LAK by Understanding its Philosophical Paradigms

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1 EXTENDED ABSTRACT

There is much debate about what properties a paper in LAK or related conferences should have. However, despite reviewers often trying to decide if a paper is "an EDM paper" or "a LAK paper", there has been limited systematic consideration of how these fields differ (but see Siemens & Baker, 2012, and topic analysis in Chen et al., 2020).

We propose that the difference in expectations between communities comes from the predominant (often unspoken) philosophical orientations of their members. The 20th-century philosopher Richard McKeon wrote about four philosophical schools of thought dating back to Plato and Aristotle (McKeon, 1966): the entitative/reductionist (Atomist/Democritus), ontological/dialectical (Platonic), existentialist (Sophist/Protagoras), and essentialist (Aristotelian) schools of thought. Reductionism involves understanding complex phenomena by breaking down those phenomena into their constituent components and then analyzing the relationship between those components. The ontological/dialectical school of thought adopts the goal of understanding phenomena as wholes, where components cannot be properly understood without understanding the whole system. Existentialism views reality as fundamentally individually constructed and therefore asserts that phenomena should be understood as the participants themselves understand them and that these understandings are irreducibly valid. This viewpoint's opposite, Essentialism, states that meaning is inherent in the universe. This viewpoint is seen in perspectives that argue for the "unreasonable effectiveness of data" as justification for rejecting interpretable modeling methods (Halevy, Norvig, & Pereira, 2009), where direct modeling of reality is seen as sufficient and no attempt at theory or explanation is needed (or, indeed, desired). The design theorist Dick Buchanan argued (in largely unpublished lectures) that most designers prefer to work in one of these paradigms, and that work from other perspectives often seems confusing or perhaps even intentionally incomprehensible or negative.

Siemens and Baker (2012) mapped learning analytics to two of these paradigms, arguing that most of the work in educational data mining had a "stronger emphasis on reducing to components and analyzing individual components and relationships between them" (*ibid.*, p. 253) (i.e. entitative, reductionist) whereas most of the work in learning analytics had a "stronger emphasis on

understanding systems as wholes, in their full complexity" (*ibid.*, p. 253) (i.e. ontological, dialectical). Work from a more essentialist paradigm tended to fare relatively poorly at EDM and LAK in these early years, and the emergence of the ACM Learning @ Scale conference provided a home for more essentialist work. With the success of ACM Learning @ Scale, and the popular movement within machine learning towards algorithms that do not attempt to be scrutable, there was a movement towards more serious consideration of prediction without comprehension within EDM. This movement was matched by a corresponding movement of entitative work into LAK, with many researchers who had previously published at AIED or EDM beginning to publish their work at LAK. More existentialist learning analytics research often appeared outside these conferences until the emergence of the International Conference on Quantitative Ethnography (followed by a large increase in the use of quantitative ethnography methods at LAK in 2020).

When a scientific field contains more than one competing intellectual paradigm, there is often a push for one of the paradimgs to "win" and take over the field entirely, as depicted in Kuhn's (1962) classic book *The Structure of Scientific Revolutions*. We hope to argue that different modes of thought are natural, are positive, and are good for the field. The complex challenges that learning analytics poses to us as researchers and practitioners (cf. Baker, 2019; Pelanek, 2020) are too large to be entirely resolved by any of these four paradigms. There needs to be greater collaboration across researchers from different intellectual paradigms -- a move towards *inter-paradigmatic* work in addition to the inter-disciplinarity that already characterizes our field.

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