**Philosophy of science and doctoral research design: The case of the Idea Puzzle framework.**

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Doctoral research design can be conceived as a set of methodological decisions (Creswell, 2017) or, more broadly, as a set of theoretical, methodological, empirical, rhetoric, and authorial decisions (Morais & Brailsford, 2019). In the latter case, Doctor of Philosophy (PhD) candidates can benefit from philosophy of science in at least two ways. On the one hand, they can coherently align the theory, method, data, rhetoric, and authorship of their research design as a reflection of their epistemological, methodological, ontological, and axiological assumptions. On the other hand, they can acknowledge traditional limitations of science such as the theory-ladenness of observation, paradigm incommensurability, and the underdetermination of theory by data (Riggs, 1992). In a recent chapter, Morais and Brailsford (2019) describe the development of the Idea Puzzle framework of 21 decisions for doctoral research design as an extension of Brinberg and McGrath's (1985) Validity Network Schema. In this book, I explain the philosophical foundations of the 21 decisions in greater detail. In particular, the theoretical framing of research design (epistemology) as: 1) two *keywords* in a non-tautological relationship; 2) two opposing *streams of thought* for critical synthesis; 3) a *research gap* from previous conclusions; 4) a *research question or hypothesis* from five levels of knowledge depth; and 5) current answers or results as the *state of the science*; The methodological framing of research design (methodology) as: 6) a meta *philosophical stance* from a matrix of four; 7) a *research strategy* from one of three meta toolboxes; 8) complementary *data collection techniques*; 9) *data analysis techniques*, including research software; and 10) one of three sets of incommensurable *quality criteria*; The empirical framing of research design (ontology) as: 11) a *unit of analysis* i.e. entity or process; 12) a *level of analysis* i.e. scale; 13) *nature of data* as qualitative or quantitative; 14) *origin of data* as primary or secondary; and 15) an analytical or statistical *sample*; The rhetoric framing of research design (axiology) as: 16) the study's practical and ethical implications i.e. *pathos*; 17) quasi-inductive, hypothetic-deductive, or abductive logic i.e. *logos*; as well as 18) theoretical, methodological, and empirical limitations i.e. *ethos*; The authorial framing of research design (axiology) as: 19) the PhD candidate's first-hand experience of the empirical phenomenon i.e. *wisdom*; 20) support network i.e. *trust*; and 21) economic resources i.e. funding and *time*. The Idea Puzzle framework for doctoral research design thus aims to put the 'Ph' back in the PhD based on 21 epistemological, methodological, ontological, and axiological decisions.

References

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Keywords:
Philosophy of science; doctoral research design; Idea Puzzle framework.