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RESEARCH SHOULD NOT INFORM PRACTICE

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This paper establishes the context for the debate to oppose the motion that "Research should not inform practice". The paper first defines what is meant by the terms research and practice in the context they are used in this debate. Four key points are then offered which illustrate the importance of research informing practice.

INTRODUCTION

This paper sets the context for the debate to oppose the motion that "Research should not inform practice". To begin we need to define what we mean by research and practice within the scope of this debate in order to confine the scope of examination. Although we do not like debates to be heavily centred around definitions (as it tends to become purely academic and less useful – yes, we have waded into our natural inclinations of practice-orientedness …), for a meaningful discussion, and to allow the audience to refute the claims of our opponents, it is unavoidable that we establish common definitions.

Within the term "research" and its close relative "theory" (Malara, & Zan, 2002) we have in mind all activities that may be classified as "systematic inquiry". Put simply in Mason and Waywood's (1996) words "the human enterprise of making sense, in providing answers to people's questions about why, how, what" (p. 1060) within inquiry for sense-making. We do not see a need – for the purpose of this debate – for a narrower definition. In an initial view of the term "Practice" it appears to be far more straightforward, until you read Lampert's (2010) paper where the term becomes far more problematic. But within the intended context behind the motion statement, we stay with "the work of teaching" and apply to the term teaching a process of decision-making. We interpret the verb "should" to mean "with the purpose of". This ought to be distinguished from "is capable of". The latter will take us into another debate: whether current research is indeed informing practice; but the former interpretation of "should" will lead us to a more fundamental and critical debate: Should anyone who is involved in systematic studies of mathematics education have a view of relating the findings of the inquiry to the work of teaching? [In this interpretation of the topic of debate we have also slipped in our take on "inform" – "relating the findings to"]. And our answer to this question is: Of course! We advance a few arguments.

We begin with this historical note: Mathematics Education emerged as field of research to address the problems of teaching

It may be argued that the requirement to "inform practice" does not apply to the 'parent' field of Mathematics – mathematicians can stay "pure": they may produce

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research that is not directly useable in practice. Here, the argument uses a sleight of hand – the word "practice" has shifted from the motion's inherent meaning of "professional practice" to "popular practice" of presumably the common public. This exposes a false comparison: while mathematics education has (and indeed was motivated by) an actual community of professional practitioners in mind, mathematics (especially the pure branch of it) does not have a corresponding professional practice to address – mathematicians communicate among mathematicians, not with non-existent "professional users of mathematics". In fact, that mathematics education was indeed originally conceived as an "applied" field is clear from the founding vision of ICMI – whose constitution was seen as a 'coming of age' of mathematics education as a field of study. For example, Begle (1969), in his address to the first ICME, 'chided' "Mathematics educators [as being] … unable to organize the kind of empirical investigation needed to *provide useful information*" (p. 239, emphases added). Neither is this a one-off reminder of the responsibility of mathematics education research towards practice. In a later ICMI Study, Bishop (1998) repeated the call, "[m]y real concern … is with what I see as researchers' difficulties of relating ideas from research with the practice of teaching and learning mathematics" (p. 33). Since then, the literature is replete with reports on addressing the "theory-practice" link, which presupposes the need for researchers to attend to the challenges of practice.

1. The survival of mathematics education research is in its usefulness to practice

We (i.e., mathematics teacher educators working primarily in universities) may not like this, but it is part of a reality played out at a global scale: Why would funding agencies continue to provide resources to researchers if the outcomes of their projects cannot be 'cashed in' in terms of actual improvements in quality instruction within mathematics classrooms? Two forces hasten the demise of funds (and hence related university positions): the pressure from populations (especially of developed countries) for answers to education problems, such as low performance in overall mathematics scores (e.g., TIMSS and PISA); and the prevailing climate of short-term paybacks to investments. There is growing impatience with 'blue sky' research that would not provide immediate 'translational outcomes' within the testbeds of classroom practice. Already, in the USA, there are disenchantments with respect to the quality of teacher preparation programmes offered by university faculty. The organized forms of this dissatisfaction can be seem in influential programmes such as "Teach for America" supported by the Gates foundation. They can be interpreted as the beginning of voices of dissent - against the prolonged lack of useful inputs from educational research in improving practice.

2. Research and practice are symbiotic

Both the terms research and practice in the form we are using suggest action and in this debate we apply the term practice to describe the work of teaching. The overlaps are clear, teaching we describe as a process of decision making and research as a process of inquiry; terms which have gained increased coinage in recent times. Mathematics education and mathematics education research is in its infancy compared to other

fields of research. We need to remember that it had its origins in a positivist paradigm, where research was statistical in nature and the teacher was positioned as the 'constant' in classroom studies (Mason & Waywood, 1996). In our experience working within the messy complexity of schools clearly the teacher as an active decision maker who is constantly 'problem making and problem solving in the moment' could never be considered as a 'constant'—that is as a replicable or reproducible factor in research.
In recent times, in our own work, as in the work of many others, we have seen how research and practice holds a symbiotic relationship, a productive synergy and without one the other has no future. For example, John Mason (1998) described the need for research to speak directly to teacher's practice in ways which caused personal understandings so that their revised view of their past experiences sensitized them to possible incidents to notice in the future. Our personal experience in working with teachers has emphasized this symbiotic relationship. As we have worked alongside teachers, their practices have been influenced by the research and in turn the decisions they make have provided us as researchers with essential learning and shaped the outcomes of our research. It is the interplay of research and practice, which results in productive tension and from which new and powerful learning emerges for all members involved. From this we can deduce a different focus of debate; we suggest that rather than questioning whether research should inform practice we should be questioning whether such criteria (commonly seen when used to assess the outcomes of research) as relevance, validity, objectivity, originality, rigor, precision, predictability, reproducibility and relatedness should be applied to the results of research informing practice within complex school settings. Again, we bring you back to our interpretation of the verb "should" and apply it to mean "with the purpose of".

3. The connections between research and practice counter development and publication of "false assumptions" or "alternative truths"

An open and honest skepticism to many statements made which draw on evidence from both research and practice is a healthy way forward for mathematics education and research in mathematics education—particularly in this new world of "alternative truths". In our former lives as practitioners within the school setting and now as researchers, we are constantly confronted with what appear to be convincing facts. It is through integration of research with practice that you are able to drill through the surface and through inquiry develop possible explanations and solutions. For example, the first author's work of inquiring into equity issues for diverse learners, she has been confronted by those who use the results of research and the results of schools separately to develop "alternative truths" based on "false assumptions" to match a right wing agenda. For example, an "alternative truth" was built around one piece of research in which it was suggested that Māori had a "warrior gene". This was used to explain their underachievement and disengagement from education. In response, we were able to counter these claims and provide contrary evidence which was built within an active cycle of inquiring into the work of teaching. The strength of evidence depended upon the theoretical and empirical research grounded within practice.

4. Useful research is "good" research

The term "good" is admittedly subjective. Thus, we start here on our personal experiences. Our research has brought us close to schools where we worked intently with mathematics teachers on problems of actual practice. It is very challenging but it also brings great satisfaction when we see teachers finding our contributions helpful to their practice. In the eyes of these teachers, "good" research is done when 'theories of research' hit the road and deliver the goods – which is, visible improvement in students' learning. And, this kind of useful research can be done without compromising on the quality (another sense of "good") of research. An example of an emerging methodology that attends to both usefulness-to-practice and rigour-in-research is Design Research (e.g., Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Middleton, Gorard, Taylor, & Bannan-Ritland, 2006). We are not suggesting that all mathematics education research need to be directly and immediately involved with 'translation' into practice. Here, we return again to the point made earlier about our interpretation of "should" in the motion statement. While some research are perhaps more 'remote' from practice, our argument is that they should nevertheless have a view of practice in mind; this is so that their research results will then have greater potential to be tapped by other researchers whose work are closer to the particulars of practice. Seen in this way, all types of mathematics education research can be "useful" in the sense that the findings may potentially be harnessed for the purpose of informing practice.

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