EVIDENCE-BASED INTERVENTIONS AND STRATEGIES FOR THE GRAND CHALLENGES APPROACH: THE NEED FOR JUDGEMENT

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ABSTRACT

What is the value of evidence-based interventions in addressing "Grand Challenges"? Building upon the EPOS Grand Challenges work (Sakhrani et al., 2017), this paper explores whether evidence-based approaches developed for management and policy are relevant to addressing Grand Challenges. It discusses the criticisms of the Evidence-based Management approach and argues that evidence is a necessary, but not sufficient input in the decision-making process of addressing Grand Challenges.

KEYWORDS

GRAND CHALLENGES: AN APPROACH TO ADDRESSING KEY, GLOBAL ISSUES

Across a number of fields, such as engineering (Mote et al., 2016), management (McKiernan, 2017) mental health (Collins et al., 2013), information technology (Winter and Butler, 2011) and social work (Uehara et al., 2013), the idea of Grand Challenges is a call for action that aims to inspire current and future generations, change the way that people think about the future and their responsibility in creating that future (Omenn, 2006; Mote et al., 2016). In any particular field or area of practice, the idea of Grand Challenges affects the academics involved and their research efforts; industry leaders and practitioners and their future business priorities; local, national and global communities and their future wellbeing; policy makers and their future political agendas; and, professions and the long-term sustainability and legitimacy of their professional status. The Grand Challenges idea aims to develop a prosperous, sustainable and secure future and calls for all stakeholders to work collaboratively beyond traditional professional, disciplinary and national boundaries in creating this future. Very close to the notion of Grand Challenges is the idea of the UN Sustainable Development Goals (SDGs) which have inspired widespread efforts throughout the world and have attracted the attention of NGOs, companies, universities, municipalities and cities which all articulate their SDG strategies and projects. Specifically, in EPOS, Grand Challenges are defined as goals which are: (i) articulated by stakeholders, (ii) specific (ii) ambitious yet feasible (iii) framed in a manner that suggests the use of specific methods or disciplines, and (iv) have the potential for broad impact (Sakhrani et al., 2017).

A first glance into how different social agents, e.g. disciplines, professions, multilateral organisations, such as the UN, and others use the notion of *Grand Challenges* shows that it is frequently perceived as not more than a list of priorities that an organisation pledges to deliver to demonstrate its commitment to socially, publicly-spirited purposes. However, and perhaps

surprisingly, a closer look into the agendas of these organisations and of meetings such as Katowice COP24 and 2018 Buenos Aires G20, shows that they hold a lot more in common and follow, almost entirely and consistently, similar approaches to addressing their chosen Grand Challenges priorities and agendas.

As such, and beyond notions of listing and outlining priorities, the *Grand Challenges Approach* is in this paper defined as an approach which extends beyond the identification of key, global challenges, and involves the development of evidence-based interventions and strategies which are meant to be delivered by the creation of trans-disciplinary Grand Teams and be propagated to future generations by targeted education priorities and initiatives. Similar efforts have been identified in the area of SDGs, where the complex relationships between different challenges, solutions and stakeholders have been emphasized, along with the need for establishing measure and formulating projects which address the SDGs and enable the knowledge transfer between developed and developing countries (Thuesen and Opoku, 2018).

More specifically, the 4 key priorities in addressing key global issues which affect our global society involve:
1. the identification of key, global issues that are already or will affect the wellbeing, prosperity and security of the global community and the planet
2. the development of evidence-based interventions and strategies that will address these key, global issues in a coherent and systematic manner
3. the development of teams and collaboration that extend beyond all disciplinary, professional and national boundaries and bring together the stakeholders who can develop impactful solutions to key, global issues
4. the development of education priorities, systems and programmes that prepare current and future generations to address global issues and learn the skills that they need to contribute to collaborative efforts that extend all over the world.

This paper focuses closely on the second priority and more specifically asks whether a focus on 'evidence-based' interventions and strategies is sufficient to articulating solutions to key, global challenges. This question aims to address the limited scope that evidence-based management affords to professionals, academics and policymakers and other stakeholders involved in articulating responses to Grand Challenges. While the role of a variety of stakeholders has been emphasized, the focus on 'evidence-based' interventions and strategies tends to limit the stakeholders involved in articulating responses to Grand Challenges to experts and those with access to scientific inquiry and methods.

WHAT IS EVIDENCE-BASED MANAGEMENT?
Evidence-based management (EBM) is traditionally defined as an approach to management decision-making for practitioners who need to make difficult decisions in everyday practice (Briner et al., 2009). As an approach, EBM has been closely linked to the scientific input of academics in decision-making. Academics capture data and create scientific evidence that is communicated to practitioners in the form of scientific insights and case studies which are derived from datasets based on different methodologies and ontological assumptions. Evidence-based research methodologies, such as systematic literature reviews, summarize

findings based on positivistic and quantitative research, which "sees knowledge as accumulating" (Noblit and Hare, 1988, p. 12), in areas such as medicine. In this way, decision-making can be informed by scientific evidence and becomes evidence-based. Evidence-based theorizing appeals to academics, policy-makers, practitioners and professional bodies because it claims to reveal and expose half-truths, unpack conventional business thinking and instill confidence levels and certainty in decision-making (Pfeffer and Sutton, 2006). It seeks to challenge an over-confidence in one's experience and expertise (Ehrilinger at al., 2008), but also highlights the importance of judgement and critical thinking and encourages the practitioner to embody decision-making which is based on scientific data specifically, consider the ethical implications of their decisions and the potential harm that may be caused from ignoring available evidence (Rousseau, 2012). Similarly there have been recent calls for evidence-based policy-making (Ansell and Geyer, 2017) and industry best practices. Under this management approach, an evidence-base is seen as a prerequisite of any worthwhile understanding of reality, as an authoritative source of knowledge, and a way in which academics can influence other stakeholder communities based on the strength of their evidence. In a way, evidence-based management is an advocate of scientific datasets which are seen to complement theory-based decision-making, information decision-support systems, and most recently artificial intelligence (AI).

EVIDENCE-BASED MANAGEMENT: CRITICISMS

Evidence-based management has been met with significant criticisms. Most notably, it has been found that whilst the academic community has encouraged the practitioner to adopt an evidence-based approach to decision-making, perhaps ironically there is little evidence which shows that evidence-based decisions are better decisions or lead to better organizational performance (Reay et al., 2009). For example, even in medicine where evidence-based management is highly relevant, the benefits of employing evidence-based practices diminished over time whilst initially they seemed to be highly beneficial in practice (Greenhalgh et al., 2014). In the context of the Grand Challenges Approach, it is perhaps even more important to consider these criticisms in an attempt to build coherence and resilience in the study of evidence-based management for Grand Challenges. Coherency and resilience in our approach to Grand Challenges is significant in this context, not least because these are complex, wicked[1] challenges that affect most people worldwide, and because some (if not most) of the Grand Challenges are urgent (e.g. Rockström et al., 2015). We – as humanity and the global society - may not afford to wait for academics to publish their scientific insights before action is taken (cf. climate scientist James Hansen's decision to publish his paper on sea-level rise prior to the UN negotiations in Paris in 2015 and before it had been through peer review).

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[1] Grand challenges can be considered as wicked problems, and hence not necessarily have an evidence-based type of answer. Usually, evidence-based research was developed in medicine, where research is mostly incremental and paradigmatic, hence, the combination of research findings don't risk incommensurability. Moreover, the types of questions asked by researchers in medicine are more focused and answerable, e.g. will a certain protein increase the risk of a certain disease? The human body is by no means simple, but its working mechanisms are much better understood than the type of questions researchers ask in relation to issues such as climate challenge and more importantly, management and governance approaches to tackle grand challenges.

The key premise of EBM is that evidence is needed to displace myths, misleading half-truths and rules of thumb and instill good principles of scientific thinking in boardrooms and the committees of multilateral organizations. However, Grand Challenges are better seen as ethical, rather than management, problems (Mazutis and Eckardt, 2017). Potential actions may not solve the problem, but involve making hard choices and compromises, and therefore, Grand Challenges will most likely involve decisions that are inherently ethical. Ethical decisions related to Grand Challenges are deeply uncertain, so the evidence base on which a decision is made needs to account for the sheer uncertainty of the decision itself and the socio-technical system we are intending to change. Ethical decisions break all canons of classic rational decision making: alternatives are not known at the outset (or worse still- deliberately ignored), we cannot know exactly the consequences of potential different alternatives, and perhaps more importantly we don't know our preferences and what a desirable output may be. For example, we do know that we want the planet to stop overheating, but are unaware of what this might look like or what the implications of our decisions making may be. As such, we are restricted to developing our understanding, perception, emotions and views of possible alternatives in the process of decision making. Would we be as caring about climate change if this meant we had to uproot our families and relocate, or place a windmill and solar panels at the back of our garden, or if various bird species would be further endangered in the process? For example, studies in the implementation of wind energy projects in Germany and the Netherlands have shown that deliberative public participation is key in addressing public concerns such as the sound levels of turbines and their distance from the place of residence which may stall or altogether postpone these projects (Langer et al., 2017; 2018, see also Agterbosch et al., 2007). Civic and political consensus is hard to reach, and the perceived moral intensity of a situation will vary across different stakeholder groups and will affect the moral judgment of agents which, in turn, is framed by the level of social consensus on a matter and the perceived magnitude of the consequences (Morris and McDonald, 1995).

In other words, Grand Challenges involve hard-to-measure constructs and require a) novel ideas and significant breakthroughs, b) effective processes that involve collaboration across inter-organizational, interdisciplinary, international boundaries, c) a significant level of flexibility in handling emergent and constantly reconfiguring relationships, processes and decisions, and the realization that responses to Grand Challenges can be reached in many different ways (equifinality), d) learning from extreme cases (Eisenhardt et al., 2016). Here, in the best case, scientific datasets are only one of the inputs which need to be considered in decision-making and there is a danger that we may be mesmerized by strong levels of scientific confidence. We may rely too heavily on scientific thinking and ignore the ethical dimension of Grand Challenges, we may underestimate the relationships and processes which need to be built and developed to ensure that legitimate stakeholders are heard, and altogether limit the scope of our thinking to scientific thinking. To the extent that Grand Challenges are ethical problems which manifest in a social context, we cannot disregard the very idea that multiple realities will be at play, interacting with one another and among social actors. Similarly, we cannot neglect the meanings and ethical principles that underlie the institutionalization of processes and the legitimisation of various actions and behaviors (Berger and Luckmann, 1966). To add to the complexity of addressing and articulating responses to Grand Challenges, in recent years, the notion of multiple realities has taken on new meaning and we have seen the

rise of fake news. This 'post truth' phenomenology leads to a situation where plausible views and opinions are mistaken as facts and thus evidence. Taking this consideration into account, what constitutes evidence and the social-political legitimacy of it becomes equally important. Similarly, whilst science generates 'facts', they are often valid within their own local knowledge domains but often contested outside of their field and thus generate limited, if any, impact when faced with the social, political and economic reality of organisations and institutions. Such observations resonate with latest policy initiatives. For example, in Denmark the government has initiated an extensive program on redesigning the "Examen philosophicum" in Higher Education, as a countermeasure to the raise of fake news and relativism.

In other words, evidence-based management may bias our thinking and decisions about which aspects of reality are worthwhile talking about and which social groups are considered to be legitimate in the Grand Challenges debate and in making these decisions (Biesta, 2007). Questions that are not scientifically derived and based on previous scientific work and foundations are frequently deemed unworthy of exploring. Those who do not hold knowledge derived from scientific methods are deemed to be mere observers of reality, and it has been argued that the focus on evidence-based management is "a function of interests served by the universalization of certain forms of managerialist 'evidence'" (Learmonth and Harding, 2006). In this light, Hornung (2012) argues that evidence has been used as a means to justifying scientific, research-based rationality; that there is an optimistic belief in the scientific process which lacks critical philosophical and epistemological debate of various research processes and funding. Similarly, Hornung argues that there is little definition of what evidence is and for who and what purposes it is produced. In the field of education, the academic community has been criticized for promoting the idea that evidence-based theorizing is superior to other approaches to understanding reality and for 'pathologising types of knowledge' that are not scientific and/or theoretical (Scott et al., 2004: 44). By implication, the decisions of practitioners and policymakers who adopt evidence-based management approaches may be limited and exclusionary, and indeed there has been recent interest in the construction and infrastructure field in initiatives such as the Special Issue on *Theorizing Expertise in the Construction* in the Construction and Management Economics (CME) Journal (2016).

Pathologizing types of evidence, knowledge and insights in reality which escape scientific legitimization is particularly significant in the context of the Grand Challenges Approach, as Grand Challenges often affect the public and global community. Grand Challenges, such as climate change, poverty and water sanitation, may reflect issues which can benefit from the scientific process and the evidence it produces. However, the superiority of scientifically-derived evidence and data over the views, opinions, emotions and subjective interpretations of the public, lobbies and think-tanks, legislators, educators, NGOs and other similar organisations is arbitrary. As such it requires scrutiny and deliberation in the Habermasian sense and an explicit focus on deciding who is a legitimate agent at the table of negotiation and decision-making for Grand Challenges. In this regard, the priorities outlined in the Grand Challenges agendas of professional bodies, such as the National Academy of Engineering (NAE) in the USA, have been seen as neglecting "the quiet voices that speak from within each of us, from our heart" (Catalano, 2012: 152), "the social and historical assumptions" and "the humanistic and democratic potential" of engineering (Slaton, 2012: 95). Cech (2012) condemns them for "authorial particularism", for "deterministic definitions of

progress" (p. 85) and for "ignoring non-technical matters, such as social justice" (p.90). Riley (2012) brings home further considerations by outlining the gender, professional background and nationality of the 18 people who developed the 2008 Grand Challenges for NAE. The demographic profile of the committee consisted of 12 engineers and 6 others from scientific fields, 3 out of 18 were women and only one was an engineer, they came from academic, government and industry (with a focus on inventors/entrepreneurs/CEOs) and non-US nationals had strong ties to the US, while diversity indicators such as race and ethnicity were not available.

Also, a strong emphasis on evidence-based theorizing may restrict the very notion of expertise, and lead to what Williams and Gilovich (2008) named the above-average effect, i.e. claiming that, at least at the expert level, particular cases require highly specialized responses, which extend beyond the mastery of evidence-based practices and what is considered to be the 'average'. Expertise requires "intelligent emotions and reasoned intuitions" (Sarkissian, 2010: 6) which are developed through a process of heightened, ongoing reflection and allow one to sense their environment, intuitively live life and make decisions which further encourage their emotional and social development. Fundamentally, expertise involves the finer, intuitive adoption of relevant/appropriate evidence-based practices when this is relevant to particular cases, and we have been warned about the 'heightening danger that in future skill and expertise will be lost through over-reliance on calculative rationality' (Dreyfus and Dreyfus, 2005: 790). From a philosophical perspective, this argument is captured in the following idea:

> *"Because we are afraid of speculative ideas, we do, and do over and over again, an immense amount of dead, specialized work in the region of 'facts.' We forget that facts are only data; that is, are only fragmentary, incomplete meanings, and unless they are rounded out in complete ideas—a work which can only be done by hypotheses, by a free imagination of intellectual possibilities—they are as helpless as are all maimed things and as repellent as are needlessly thwarted ones." (Dewey, 1927, p. 8)*

Heavily relying on scientifically derived evidence-based studies harbors the risk of the naturalistic fallacy where 'what is' is assumed to be 'what ought to be'. Again, the ethical discriminations that the expert needs to attend to cannot be derived from scientific datasets alone, and require what the philosophers have called a conversation with civilization and humanity (Dewey, 1927; Bernstein, 1980). Scientific thought and datasets need to be contextualized in time, history, space and the cultural and social norms of a society and debated in relation to feasible but anticipated, idealized (i.e. non-existent) positions and future destinations for society (Swift, 2008). It is almost impossible to identify studies which acknowledge and critically evaluate the normative content and implications of empirical research, which suggests that we may be readily basing our decisions about Grand Challenges on untested and taken-for-granted assumptions about the political and economic course of society and humanity (Victor and Stephens, 1994). In practice, this means that practitioners who need to make difficult, ethically-challenging decisions may be running the risk of behaving irresponsibly. Judt (2007) identified 3 forms of irresponsibility. Political irresponsibility involves decisions which are made out of context, such as designing and

delivering a engineering project without considering its implications for the local communities or the political circumstances that will emerge upon project completion. Here the decisions the professional makes are de-contextualized and are likely to be based on pre-existing assumptions which could prioritise the political, economic and ideological needs of one group of stakeholders over those of other rightful and legitimate project stakeholders. Intellectual irresponsibility involves decisions based on a limited understanding of one's practice. Here, the professional is not actively involved in the strategic development of their discipline which is a key obligation of professionals (Freidson, 1986). In this case, the professional is restricted by their understanding of their practice, does not stay abreast latest development and, as such, remains locked in applying disciplinary knowledge and skills that once had been cutting-edge, but are now obsolete or, even more frighteningly, challenged as malpractice. Finally, moral irresponsibility arises from 'not knowing the difference between what is right and wrong'. Apart from misjudging particular cases, the professional may be more inclined to commercialise their expertise for purposes which would be deemed immoral had he/she been engaged in a process of reflection (an internal conversation, Archer, 2000) and had developed what is commonly referred to as a moral compass. Highlighting the potential forms of irresponsibility suggests that there is more to making professional decisions than the consideration of datasets and scientifically derived evidence, even though the latter are relevant too.

Finally, from a more political perspective, evidence-based management can be seen as a discourse, i.e. an institutionalised rhetoric which in extreme cases can disqualify and replace other frameworks of thinking, such as everyday observations, intuition and - dare we argue - imagination (see Blanchot (1989) for a philosophical interpretation of imagination, or Morgan (1993) and Chia (2003) for an analysis of imagination from an organisations studies perspective). Albert Einstein said that "imagination is more important than knowledge. To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science" (cited in Morgan, 1993). Similarly, evidence-based management can turn out to be no more than a management fashion with not much more to offer than some gains for those who benefit from its dissemination (Abrahamson, 1996). Again, the field of medicine is telling of the inadequacy of strategies to disseminate evidence-based practices to staff and therefore everyday practice. For example, as early as 2001, in psychiatry, a study revealed that "there are multiple reasons why evidence-based strategies have not been implemented at satisfactory levels. These reasons reflect almost every conceivable factor that influences the provision of services: federal and state laws, local ordinances, administrative policies, funding priorities, community resources, the concerns of advocates, the interests of local consumers, and program staffing" (Corrigan, et al., 2001: 1591).

These political consideration suggests that the adoption of evidence-based management in decisions about Grand Challenges needs to follow an anarchist tradition. Here, the authority, hierarchy and domination of any dataset or evidence is not self-justifying - it needs to be challenged and if it cannot justify itself it needs to be dismantled under the watchful eye of the professional who is making decisions with due regard to the political, intellectual and moral implications of such decisions. Rooted in enlightenment, the anarchist tradition can lead to a conceptualisation of a social order where voluntary, free association and creative work under

one's own control can become dominant and work towards revising and revolutionising society and the role of data and evidence in the decisions that are most pertinent for our future and that of our planet (Arendt, 1959; Archer, 2000; Chomsky, 2014). This also reflects the aspirations and orientation of millennials and professionals from across all generation who embody a millennial mindset (Konstantinou, 2017).

In conclusion, there are extensive and significant considerations that have been raised about evidence-based strategies and interventions and which this paper seeks to highlight. Despite these considerations, we – in a twist of agency - will not be discouraged or disqualify evidence-based practices and decision-making altogether. It should be remembered that, at least in a court of law, an expert witness is often an academic who contributes evidence in an attempt to arbitrate and help decipher what truth and relevant evidence is in a particular case (Freidson, 2001). Similarly, journalism and the media will still typically reference experts from academe when it comes to articulating thoughtful opinion. Project management is new on the professional institution playing field, but if one looks to areas such as engineering, law and medicine, one finds that the media seek out those who are both highly regarded within their profession, but who also hold academic positions, ideally practicing. Thus it is quite common for those holding senior positions in professional institutions to also be professors. In other words, experts do indeed formulate their views on particular matters on data and evidence, but are also seen as being deeply familiar within their area and able to assess and critically evaluate the information which leads to their expert opinion. Our aim in problematizing EBM is to better understand how it can more poignantly help address and articulate responses to Grand Challenges. We see EBM and the strategies and interventions that it is likely to produce as necessary in a landscape of multiple approaches, such as suggestions towards transnational collaboration and organisation (Morris, 2017) and approaches which seek to open up the space where we can envision solutions and courses of action that we have not yet conceived (Konstantinou and Müller, 2016). We seek to reinstate the significance of judgement in the process of articulating responses to Grand Challenges and alert those who design the direction of professional bodies, organisations and institutions to the above criticisms so that they can help improve EBM. Specifically, we suggest that it is important to revisit the ways in which we seek to build resilient, more meaningful arguments. As such, we propose that this enquiry needs to start with the following questions:

- What is the extent to which academics, policy-makers, practitioners and professional bodies should rely on evidence-based/empirical work when articulating responses to the Grand Challenges? What kind of issues related to Grand challenges could benefit from evidence-based decision making (some might)? How could the 'evidence' be integrated and interpreted into decision making?
- What is the potential value of more inclusive, democratic approaches to understanding how we articulate responses to Grand Challenges? Which stakeholder groups/communities need to be included in, or even excluded from, the study of Grand Challenges?
- Given that inductive methods are better suited for articulating responses to Grand Challenges (Eisenhardt et al., 2018), how should we be changing the way we think and

apply the principles of evidence-based management? Is there time for this, or should we "just do it"?

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