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Nurturing cross-disciplinary research: Institutional logics, hybrid Spaces and meta-organization at a research university

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1 Introduction

The emergence of “big research” has given rise to a variety of organizational environments (e.g. powerful research “labs”, projects and centres) that complement and transcend the traditional departmental structures of universities. Success in building and sustaining these “organized research units” (Geiger, 1990), and in reconciling their competing interests, is central to the mission of a “research university”.

In this preliminary study, we focus on individual experiences of working in cross-disciplinary research projects and centres within a large research university. Through interviewing key

individuals (project leaders, academic and non-academic staff) engaged in running large research projects and/or centres, we aim to unpack the diversity and dynamics of different institutional logics at work at different stages of the organized research unit (ORU) life cycle. We seek to draw general conclusions in terms of managing and reconciling the research missions of ORUs, the university, and its external stakeholders (government, industry and society in general).

The paper is structured as follows: Section 2 provides a review of literature introducing the conceptual frameworks that inform our study. Section 3 explains the research methods and the contexts of the study. Section 4 presents the findings, which are discussed in Section 5, followed by concluding remarks in Section 6.

2 Conceptual Frameworks

2.1 Organized Research Units (ORU)

The term “organized research unit” (ORU) was first employed after the World War II at the University of California (Geiger, 1990). The ORUs provide both disciplinary and interdisciplinary structure that can respond to social demands for relevant knowledge and provide access to a larger pool of resources for the “research enterprise” (Geiger, 1990). Etzkowitz (2003) has described university research groups as ORUs (which he calls ‘quasi-firms’) that flourish “especially under conditions in which research funding is awarded on a competitive basis”. The ORU to which competitive awards are directed is the research project, usually a temporary organisation which ceases to exist once its objectives have been reached or its sources of support have been exhausted (Ratcheva and Simpson, 2011). Although research projects are often overlooked as organisational entities (Freeman and Millar, 2017), larger projects share the ORU characteristics of university-based research centres, which exist “principally to serve a research mission, beyond the departmental organization and includes researchers from more than one department” (Bozeman and Boardman, 2003). A critical recognition here is that the research missions of its ORUs place organizational demands on the university that may not be fully met by the “professional bureaucracies” (Mintzberg, 1979, as cited in Musselin, 2006) of its academic colleges,

schools and departments. The relative autonomy of ORUs (for example, large projects or centres with their own budget, accounting structures and boards of directors) is a source of organizational tension within the university.

2.2 Meta-organization

An ORU constitutes an “entity” nested within other ORUs (for example, research groups within projects or projects within centres) as well as within the academic departmental structures and those of the university as a whole. The nesting of ORUs within other organizational structures suggests that the concept of “meta-organizations” (Ahrne and Brunsson, 2005; Gulati et al., 2012) as a useful conceptual framework for our study.

According to Ahrne and Brunsson (2005), meta-organizations are organizations whose members are other organizations, rather than individuals, while Gulati et al. (2012) include individuals in their definition of meta-organizations as “networks of firms or individuals not bound by authority based on employment relationships but characterized by a system-level goal”. The meta-organization framework should help explain some of the tensions inherent in sustaining ORUs in the university environment, in which academic staff are relatively “loosely bound” to the organizational authority of their university employer (Musselin, 2006)

2.3 Institutional Logics

The institutional logics perspective highlights the heterogeneity within an institution, where multiple logics provide the dynamics for potential change in both organisations and societies (Thornton et al., 2012). The concept of hybrid logics is another promising framework for understanding how universities (or their constituent ORUs) “can and do manage and exploit tensions” (Upton and Warshaw, 2017, p. 100). In a similar vein, recent organisational studies of higher education show the emergence of “hybrid spaces” in which ORUs might manage such different logics and demands (Perkmann et al., 2018).

The concept of “ambidexterity” provides further theoretical guidance on how conventional organizations, such as firms, create “dual” structures and systems for managing conflicting demands in their environments (Ambos et al., 2008). Separate units are created to have

lateral processes linking different demands together. The principle of dual structures allows individuals in each unit to work on one set of demands while the challenge of reconciling the conflicting demands is left to “a small group of senior executives” (Ambos et al., 2008).

According to Ambos et al (2008), the tensions of managing different demands within a university are found to be more explicit at the individual level than the organisational level. Nevertheless, we know little about how individuals negotiate different roles and identifies within the organisational structures. In the light of this, we explore the roles and practices of individuals within university-based ORUs, including multiple roles (e.g. academic department and ORU commitments) which lead to “role strain” (Boardman and Bozeman, 2007). ORU staff profiles differ from those of the broader universities, for example including program managers and executive directors as “boundary spanners”, alongside academic-career-track professionals (Perkmann et al., 2018).

2.4 Research Infrastructures

Mindful that many ORUs follow a defined life cycle in seeking, using and exhausting time-limited research funds and other resources, we chose to frame our interview questions around the concept of research infrastructures, broadly understood as encompassing not only generic physical resources and technologies, but also the combination of ideas, money, people and organizations that enable the research process. Framing our questions around infrastructures also provides a contextual link to studies of knowledge infrastructures, open access and the information commons (e.g., Benkler, 2016). We used the Royal Society’s “Research Infrastructure Key Stages” (Royal Society, 2018, p. 13) as a guide in explaining our approach to interviewees in our study.

3 Research methodology and contexts of the study

This study attempts to uncover institutional logics, as they intertwine with individual identities and organisational practices. This is done by two steps: first, by collecting individual responses and perspectives of actors from interviews; secondly, by identifying and extracting institutional statements (informed by Watkins and Westfahl, 2016) based on

these responses. In this exploratory study, we focus on key individuals in ORUs at the University of Edinburgh, one of the largest research universities in the UK. The most recent Research Excellence Framework, a research ranking used by the UK government to determine future research funding, ranked Edinburgh 4th in the UK for research power. The University's research income for 2017/18 was £280m.

The study used a qualitative research approach (semi-structured interviews) to answer the main research question: *How do academic and non-academic participants involved in large (> 5m award value) collaborative research projects and centres perceive:*

- Their role(s) at different stages in the life cycle of their exemplar initiative(s)
- Their identity and sense “belonging” in the various organisational units (“layers”) involved in the initiative
- The support needed, and received, from the relevant “professional bureaucracies” across the university
- The management of “membership”, and of access to resources, within the initiative

A purposive approach was employed to select a balanced interviewee panel in terms of (a) gender, (b) academic discipline, (c) affiliation (academic college/school or central university) and (d) roles (senior academics / PIs, early career researchers and management and administrative professionals). Approval was obtained from the relevant Departmental Ethics Committee. 35 participants were contacted and data was collected from 27 participants over a period of four months. Each participant provided written consent to participate in the interviews and to recording (with one exception), transcription and analysis of the interview content. All data collected from participants were anonymised in the discussion of results. Interviews were transcribed and analysed to extract potential institutional statements and associate these with our research questions.

4 Findings

4.1 Dominant Logics

Arguably, two distinct dominant logics – “academic” and “professional services” – have informed today’s university organizational environment. The academic (or “collegial”) logic informs the identities and positioning of discipline-based scholars whose *individual* teaching and research missions are to advance knowledge in their chosen fields, while the professional services (otherwise “bureaucratic” or “administrative”) logic informs those of “other” staff whose *collective* mission is to support the efforts of their academic colleagues. While about two thirds of the collected institutional statements in our study appeared to be informed by either an academic or bureaucratic logic (with an even split between these two categories), fully one third - notably from senior researchers and research managers engaged in large interdisciplinary “STEM” projects, appeared to be driven by a more “entrepreneurial” logic that recalls Etzkowitz’s (2003) description of the “entrepreneurial university”. Etzkowitz posits the expansion the university’s mission beyond teaching and research, to include an entrepreneurial focus on economic and social development (Etzkowitz, 2003). The entrepreneurial logic is evident in statements in which respondents identify more strongly with the goals and aspirations of their ORU than with the traditionally “disinterested motives” of academic research (Geiger, 1990).

4.2 Life Cycle of Research Infrastructures

4.2.1 Planning and Preparation

Our findings suggest that, as the scale and scope of research initiatives increases, the traditional organizational model of the individual academic, supported by the bureaucratic structures of their schools, colleges and university, comes under strain. This is particularly evident at the planning and preparation stage, where the ideas and interests of multiple research groups and other stakeholders need to be assembled in a coherent and credible coalition, capable of bidding successfully for the money and authority to undertake its emerging, collective mission.

4.2.2 Construction and Operation

Study participants that we classified as expressing academic or bureaucratic dominant logics tended to see these post-award phases as “business as usual”. Individual academics

performed their agreed tasks, with bureaucratic attention focused on financial accountability to funders. In contrast, those expressing an entrepreneurial logic were concerned with assembling and sustaining an effective ORU, capable not only of delivering on current project goals but also of building capacity to undertake future initiatives.

4.2.3 Decommissioning

Irrespective of their underlying dominant logic(s), study participants expressed regret or frustration at the loss of resources, especially the skills embodied in temporary staff such as early career researchers and management professionals employed on external, fixed-term grants. Other than a sense that the university might provide “bridging” of such staff between projects, there was no consensus on the best mechanism to protect and sustain these resources. Again, those expressing an entrepreneurial logic tended to plan more actively for sustainability of their ORU from an early stage.

5 Discussion

The “big research” challenge arises, because a university system that is equipped for supporting individual academics’ pursuit of “disinterested” research in the context of formal academic disciplines, must simultaneously build capacity for doing something quite different, namely nurturing research enterprises (operational research units, ORUs) that are focused on achieving collective rather than individual goals, taking into account the expectations of external sponsors and diverse stakeholders, in addition to those of disciplinary academics and their peers.

Universities and their constituent ORUs are not simply required to switch from the one activity to the other but to develop the simultaneous capacity for both activities, and more besides (see Ambos et al., 2008). Our interviewees were selected for their involvement in well-funded (>£5M), cross-disciplinary ORUs. Effects of cross-disciplinary *versus* single-disciplinary research were not observed, as we selected against single-disciplinary participants. Interviewees were typically enthusiastic about cross-disciplinary research or at least comfortable with its challenges. It was natural to find some interviewees in this group

with a dominant entrepreneurial logic, who identified more strongly with the ORU than with an academic discipline. They had roles from contract researchers to directors. Staff in roles classified as 'professional services' could share this logic and participate in their ORU's leadership team, breaking the earlier dichotomy between individual 'academic' and collective 'support' roles. Universities seeking to nurture ORUs might therefore avoid a dichotomy in the terms of employment of the ORU's staff.

Notwithstanding our selected set of interviewees, the academic and professional services logics remained common. Many of these staff were therefore conducting research in ORUs where an entrepreneurial logic might be beneficial. More strikingly, we observed few individuals who spanned different logics, even among this selected set. This result suggests that few staff will perform uniformly well, if the requirement to switch between types of research activity is passed down from the university to the level of individual staff, ignoring the organizational contexts, missions and dominant logics of different ORUs in which they perform those activities.

Here, the University might usefully take the position of a "meta-organization" (Ahrne and Brunsson, 2005; Gulati et al., 2012), whose members are ORUs such as externally-funded projects and centres, and whose research mission is seen more in terms of "orchestrating" its portfolio of ORUs than of managing its individual employees. Part of that orchestration would be to invest in cross-disciplinary research centres as "hybrid spaces" (Perkmann et al., 2018) in which new research ideas and broadly interdisciplinary coalitions can evolve. Youtie et al (2006), for example, show how multidisciplinary research centers represent an institutional link in the "epistemic evolutionary chain" from informal nascent networks and knowledge value collectives into new scientific fields and disciplines – and presumably also into successful ORUs.

6 Concluding remarks

We have taken the position of reflective practitioners (Schön, 1983) in seeking to test the salience of organized research units (ORUs) and their governance and management as part of the university's "big research" mission. Our initial study explored the dominant logics of ORU participants across the life cycle of their exemplar initiatives, presented to them as

research infrastructures. Our findings suggest that the university could usefully act as a meta-organization that recognises and supports ORUs in ways that complement and transcend traditional academic departmental structures, including the creation of hybrid spaces to encourage “mixed logic” coalitions. Further work is planned in which we will test our emerging hypotheses in case studies of selected ORUs, and the prospects for management actions such as staff training.

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Author contributions

Conceived project and funding: AJM;

Designed research: PLF, IHM, AJM;

Performed research: PLF, IHM;

Analysed results: PLF, FK;

Wrote the paper: PLF, AJM, FK.

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