



Superstars in the making? The broad effects of interdisciplinary centers

Susan Biancani^a, Linus Dahlander^{b,*}, Daniel A. McFarland^c, Sanne Smith^c

^a Airbnb, United States

^b ESMT Berlin, Germany

^c Stanford University, United States



ARTICLE INFO

Keywords:

Organizations
Universities
Knowledge
Networks
Interdisciplinarity
Centers

ABSTRACT

Many universities have developed large-scale interdisciplinary research centers to address societal challenges and to attract the attention of private philanthropists and federal agencies. However, prior studies have mostly shown that interdisciplinary centers relate to a narrow band of outcomes such as publishing and grants. Therefore, we shift attention to include outcomes that have been the centers mandate to influence – namely outreach to the media and private industry, as well as broader research endeavors and securing external funding. Using data covering Stanford University between 1993 and 2014, we study if being weakly and strongly affiliated with interdisciplinary centers in one year relates to and increases (1) knowledge production (publications, grants and inventions), (2) instruction (numbers of students taught, PhDs and postdocs advised), (3) intellectual prominence (media mentions, awards won and centrality within the larger collaboration network), and (4) the acquisition of various sources of funding in the next year. Our results indicate that interdisciplinary centers select productive faculty and increase their activity on a broad range of outcomes further, and in ways greater than departments and traditional interdisciplinary memberships, such as courtesy and joint appointments.

Today the multiversity contributes to society through a wide spectrum of activities, with academia playing the ancient and honorable roles of discoverer, conservator, interpreter, and transmitter of knowledge, values, and understanding, as well as the contemporary roles of creator of opportunity for young men and women; developer of new technologies, processes, and even products; and partner with governments, industry, and philanthropists to directly contribute to the advancement of economies, security, health, and quality of life. — Former MIT President Charles Vest (2007: 37)

1. Introduction

As President Vest observes, the mission of the American research university has evolved and expanded in recent decades. While the core mission of universities has long been to educate young people and to discover and transmit new disciplinary knowledge, today universities also strive to contribute more directly to society. Their contributions take a variety of forms: technological innovation; economic advancement; preparing young people for careers in business, engineering, and the public sector; and practical solutions to perennial social problems such as human health, environmental quality, and international security.

Several factors have driven this shift in mandate. In the modern knowledge economy, universities are increasingly socially embedded and in demand (Peterson, 2007; Weingart, 2000). Since World War II, universities have played a central role in the development of technologies that drive growth in the American economy (Mowery et al., 2002)—lasers, the internet, computers, global positioning systems (GPS), new financial instruments, modern genetics, and much of modern medicine are just a few examples. At the same time, many technology-reliant companies have cut their budgets for research and development, opting to lean more heavily on collaborations with universities (Geiger and Sá, 2008; Salter and Martin, 2001; Owen-Smith and Powell, 2004; Powell et al., 2005).

Combined with this pull from outside, universities experience a push from within as they seek to diversify their sources of funding and support. Research partnerships with corporations, in which a corporation directly funds a project in a university lab, are one source of income. Another revenue source for institutions with the means to innovate is technology transfer—that is, the patenting and licensing of discoveries in universities (Bozeman, 2000; Fleming and Sorenson, 2004). Additionally, efforts to understand and solve intractable social problems attract research funds from federal funding agencies, private foundations and philanthropies, and individual donors (Birnbaum,

* Corresponding author.

E-mail addresses: linus.dahlander@esmt.org (L. Dahlander), mcfarland@stanford.edu (D.A. McFarland), sannesmith@stanford.edu (S. Smith).

1977; Cameron and Tschirhart, 1992). In combination, these trends have driven universities to become more open systems, responding readily to their institutional environments (Gumpert and Sporn, 1999; Owen-Smith, 2003).

Though universities seek to grow more flexible and responsive, they are loath to give up their organizational arrangement into disciplinary departments. Departments are communities of scholars with similar training who work on related research questions. They speak the same epistemic language, and are well poised to evaluate and build upon one another's work, both helping to maintain the quality of research and providing a ready audience for it (Blau, 1973). Despite their importance—or perhaps because of it—departments remain a source of inertia in the university organization. Likewise, the academic job market constitutes a system of exchanges between university departments, further conserving the dependence on departmental structures (Turner, 2000).

Research universities have hit upon a solution for introducing flexibility by differentiating internally into a layered organization (Biancani et al., 2014). On the one hand, they retain traditional departments that provide stability and facilitate rigorous, disciplinary academic communities. On the other hand, they invest heavily in large-scale, interdisciplinary research centers constituted around practical problems and that are well positioned to address both the grand challenges of society and attract the attention of private philanthropists and federal agencies (Jong, 2008).

Research on interdisciplinary research centers is not new. Boardman and Bozeman (2007) gives a somewhat negative story on the role of these centers. Using 21 interviews, they find that faculty experience role strain from their involvement in interdisciplinary centers. They see centers and departments as making incompatible demands on faculty that require them to play increasingly complex and hybridized roles. They argue that institutional demands compete so that faculty time, grant money, and attention to students is spread in a zero-sum fashion across departments and centers. As a result, departments or centers lose out, and faculty find themselves stretched thin between them. While an elegant argument, memberships in departments and centers do not have to compete, and especially when institutional rules prevent such competition. Using the same setting as this paper, Biancani et al. (2014) focused on two centers and found the institutional rules required faculty to either run their grant money solely through departments or it be “double-counted” in departments and centers; that centers be prevented from official student training; and that faculty hires be primarily in departments, only secondarily in centers. This setup enabled center memberships to be a benign addition to the formal organization of departments, merely adding and furthering activity without poaching departmental resources and collaborations. As a result, centers catalyzed faculty research productivity in grants and publications over and above their departmental affiliations, and without detracting from departmental collaborations and resources (Ibid).

Complementing this view is the work of Sa. In a review paper, Sá (2006) examines ‘interdisciplinary strategies’ to spur collaborative research across traditional departmental and disciplinary boundaries, including the creation and adaptation of university policies, practices, and structures. It also identifies and analyses the use of incentive grants to initiate new interdisciplinary units, the establishment of ‘campus-wide institutes’ that steer campus investments in interdisciplinary areas, and new modes of faculty hiring and evaluation. Sa's dissertation also provides five case studies to explore the rationale for why centers emerge in the first place.¹ Sa suggests that centers can arise without competing with departments. An important argument in Sa's work is that centers arise not only to increase faculty's productivity regarding traditional research outcomes, but serve to *broaden* the array of faculty work activities beyond academic publishing and grants. Calling for a

broader appreciation of the effects of centers, Geiger and Sá (2008) provide a qualitative account on how centers could potentially also affect commercialization efforts.

We build on this prior work and offer several contributions. Our *first* contribution is to empirically demonstrate that interdisciplinary centers increase research output, *and that they greatly expand the work activities of faculty in a variety of new directions*. Not only do these centers ratchet up research productivity, but they encourage faculty to do more public outreach, student training, and to develop more commercial products and patents. As such, our work reaffirms prior work by Biancani et al. (2014) that shows centers increase research activities of publication and grant writing, but also finds that in catalyzing research activity, the centers push faculty into advising roles with both more doctoral students and post-doctorates. Our work also confirms what Boardman and Bozeman (2007) and Sá (2006) contend: that centers promise to facilitate research concerning real-world issues and to speak to external concerns (Rhoten and Parker, 2004). We find centers amplify the recognition of faculty research in the media and in wider circles of knowledge consumption. We even find that interdisciplinary centers spur faculty to engage in commercialization and the creation of new inventions (Jong, 2008).

In so arguing, it is important to consider that interdisciplinary centers are not all the same, nor that they will always have such returns. In fact, we fully acknowledge that interdisciplinary centers vary (as Boardman and Bozeman have argued) and have greater returns on certain expanded sets of outcomes over others. Moreover, we agree with Sá (2006) that this ratcheting and expansion of activity is only feasible when university rules and policies are in place to prevent centers from competing with departments. In the context of our focal university, that is precisely how the rules were defined, and as a result we see no evidence of role strain. The returns of center memberships are sustained over time on a wide variety of work outcomes.

A *second* contribution is that we show centers can ratchet up and expand the range of faculty work activities because *they select talent and succeed in securing larger pools of resources from the environment*. Previous research has already shown some evidence for this as well (Biancani et al., 2014), but suffers from generalization issues as their test has been for limited outcomes and a limited time. For example, a study testing the relation between center membership and publications only cannot generalize easily to center effects on teaching as these outcomes differ considerably; and a study with a short time frame can say only little about the durability of center effects. Our study shows that with selecting and supporting star faculty, interdisciplinary centers enable faculty to build teams and a work apparatus (and labs) by which they can accomplish a wider range of activities. In addition, we show this holds true for over a decade, and thus, that centers can be durably beneficial to universities and academic production. This finding helps explain why the interdisciplinary centers we study do not generate role strain nor lead faculty to focus on research at the exclusion of teaching (Boardman and Bozeman 2007). In our analyses, we find that centers draw in star faculty, and then basically help these faculty increase their output further on multiple dimensions. Centers encourage key network actors to bridge and collaborate further with colleagues and to build teams of shared PhD students and postdocs across labs. In addition, interdisciplinary centers encourage faculty to seek out and win large grants (via seed grant funding), and advertise their work to the public, drawing in donor money. In sum, centers draw in talent and network entrepreneurs, as well as resources, and in so doing they enable heightened and expanded forms of research activity. Interdisciplinary centers become a significant counter-weight, of equal or even greater influence than departments in the university organization, when organizational rules are in place to render them complementary (non-competing) organizational offices to departments and when they secure various forms of capital (human, social and financial) that enable larger and broader scientific efforts to occur without inducing role-strain.

The *third* contribution comes from a deeper appreciation of how

¹ Sa also discusses one of the cases presented in our study, albeit briefly (2006).

Download English Version:

<https://daneshyari.com/en/article/7384480>

Download Persian Version:

<https://daneshyari.com/article/7384480>

[Daneshyari.com](https://daneshyari.com)