



Identifying Roles in University-Industry Research Partnerships

Lynette F. Wilcox, Virginia Tech

Lynette Wilcox is a doctoral candidate in Industrial and Systems Engineering at Virginia Tech. She has been investigating various aspects of academic and industrial partnering while completing her dissertation research on trust in university-industry research partnerships. Lynette has held administrative and research assistantships with the NSF Center for e-Design to support her research work in this area. Additionally, Lynette also holds a Master's degree in Industrial and Systems Engineering and a Bachelor's degree in Electrical Engineering from Virginia Tech.

Identifying Roles in University-Industry Research Partnerships

Abstract

The term “university-industry partnership” is quickly becoming an over-generalized term used to describe the countless ways that academia and industry engage with one another. Additionally, within these partnerships there are further over-generalizations of the participants as either “academic” or “industrial.” As the national interest in the U.S. for improving research collaboration between universities and industry increases, these over-generalizations become more problematic. More specifically, oversimplifying the roles the academic and industrial participants play in these partnerships make it difficult to apply research-based recommendations for improving partnering processes.

This paper presents one step toward developing a role-based theoretical model - identifying the roles that the academic researchers might play in the context of university-industry research partnerships. These roles do not necessarily represent formal titles, but identity-related roles that can signify the motives with which academic research faculty engage with industry in the context of collaborative research and technology commercialization. Through examining literature in this context, three dominant research faculty roles are identified and described in this paper: (1) entrepreneur, (2) inventor, and (3) consultant.

A comprehensive role-based model will be useful for researchers and practitioners to clearly discern the types of relationships that are relevant to the work they conduct in university-industry research partnerships. A key factor in improving university-industry research partnership experiences is advancing our understanding of the nature of the roles and relationships among participants. Finally, clarifying these roles will be helpful for moving forward with a more focused research agenda for university-industry research partnerships.

Introduction

There is increasing national interest in the U.S. for developing stronger connection points and reducing barriers to collaboration between universities and industry participating in research

partnerships¹. A challenge associated with addressing these issues is the ambiguity of the terms to define the collaborations themselves as well as the role of the academic and industrial participants affiliated with these collaborations. This ambiguity can lead to research studies that yield results with substantial unaccounted variation in findings, which makes it difficult to replicate these studies or conduct the meta-analysis needed to progress toward converging findings. Thus, clarifying these terms and participant descriptions will be helpful for moving forward with a more practically applicable research agenda for university-industry research partnerships.

Currently there are many terms used in describing the general phenomenon of university-industry partnering. A few examples include *joint ventures*, *strategic alliances*, *academic entrepreneurship*, *university entrepreneurship*, *technology transfer*, *joint research*, *collaborative research*, *research commercialization*, and *academic-industrial engagement*. Numerous terms exist because different terms are appropriate for researchers' focusing on varying aspects of partnering. For example, a researcher interested in the negotiation process between academic and industrial participants might refer to the partnership as a "joint venture" to emphasize the formation stages of a university-industry partnership. In the current study, the focus on the roles of individuals in the context of various partnering activities, which could happen in different partnering situations, necessitates a generalized term that addresses the relational interaction. Therefore, the term university-industry research partnership (UIRP) will be the term used throughout.

Many researchers who attempt to study UIRPs at an individual level tend to generalize academic participants as "research faculty" or "university scientist." Further, there are not often any individual references for industrial participants; rather, they are compounded into a variety

of terms including “firm”, “company”, “business”, or simply “industry.” This study will focus on the descriptions of the academic research faculty participants and will describe them in the context of roles with which they might identify when conducting collaborative research activities commonly associated with UIRPs. The researcher used a list of activities that emerged in a recent literature review conducted by Perkmann, et al.², which included: collaborative research, academic entrepreneurship, patenting, and consulting. The roles primarily associated with each respective activity for this paper are: entrepreneur, inventor, and consultant. Following an explanation for the focus on role identification, each role will be described in turn.

Focus on Roles

In an effort to focus the research conversation around academic entrepreneurship, Jain, George, and Maltarich³ focus on the “university scientist” and his process of modifying his personal career-related role identity from an academic researcher to an academic entrepreneur. This distinction relates to the types of commercialization activities that academic research faculty members are increasingly expected to perform. While the Jain et al.³ study generalized the entrepreneurial role as encompassing a broad set of activities, which include consulting and patenting, the author for this study posits that there are separate roles - which specifically include consultant and inventor - that could also be considered in an extension of the study by Jain et al.³ Figure 1 below illustrates a theoretical arrangement of the roles that are described in the current study.

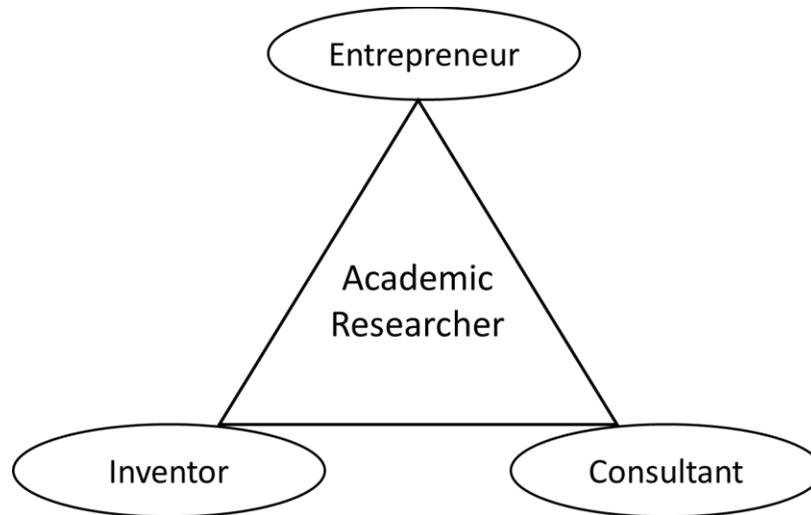


Figure 1: Roles identified for faculty participating in UIRP activities

Jain et al.³ conceptualize the academic researcher role as the primary role for the faculty participant, which is modified toward an engagement related role identity. The author agrees and therefore the role of academic researcher will not be explained in detail; instead, it is conceptualized as the central and inherent role identity for a faculty participant in UIRP activities. The other subsidiary roles, in this case, entrepreneur, inventor, and consultant, are ones in which academic researchers must negotiate within themselves to successfully participate in UIRP activities. These roles will now be described in turn.

Entrepreneur

In their literature review, Rothaermel, Agung, and Jiang⁴ define university entrepreneurship as, "...entrepreneurial activities in which a university could be involved, including, but not limited to: patenting, licensing, creating new firms, facilitating technology transfer through incubators and science parks, and facilitating regional economic development (p. 692). While broad definitions of this sort are the most prevalent in technology transfer studies, one notable exception is a definition from Louis, Blumenthal, Gluck, and Soto⁵ who

define academic entrepreneurship “...as the attempt to increase individual or institutional profit, influence, or prestige through the development and marketing of research ideas or research-based products” (p. 113). Louis et al.⁵ further define various forms of academic entrepreneurship that reiterate the profit motivation alluded to in their definition. Meyer⁶ refers to an academic entrepreneur in the context of an individual who starts a new firm using technology transferred from the individual’s original organization to the new company. Interestingly, Meyer⁶ describes a desirable distinction between “entrepreneurial academics” and “academic entrepreneurs” at the level of growth-orientation in the context of an academic spin-off. An entrepreneurial academic might not be primarily motivated by company growth, which is generally not the case for an academic entrepreneur⁶.

Another more focused description of academic entrepreneurship by Stuart and Ding⁷ describes an academic researcher as an entrepreneur when the researcher either founds a company or joins an advisory board of a new firm. The finer distinction of an academic entrepreneur is more conducive to investigating academic-industrial engagement from a micro-level focus on faculty rather than a macro-level focus on the university organization as a whole. Additionally, the more focused definition also allows for further distinction among other roles such as inventor, which may be more appropriately associated with precursory activities to patenting and licensing.

Inventor

Bercovitz and Feldmann⁸ differentiate capacity for inventiveness from propensity toward entrepreneurship, thereby, introducing an opportunity to distinguish between the two roles of inventor and entrepreneur. Di Sante⁹ describes the role of an inventor as the creator and

developer of technology that is intended to be transferred. This definition given by Di Sante⁹ may be explanatory of why a faculty person might resist engagement activities associated with patenting and licensing, but may rather expect to “hand off” research findings to industry through a technology transfer office (TTO). In other words, if a faculty sees his or herself in the role of inventor, yet not as consultant or entrepreneur, then one may feel his/her work is done after creating and developing the technology rather than continuing in the efforts forward to commercialization in partnership with an industry participant.

Agrawal¹⁰ used the term “inventor” as a general term for an academic participant in a licensing agreement at a university. Agrawal’s¹⁰ findings indicate that “firms varied substantially in the degree to which they engage the inventor....One-third didn’t engage the inventor at all” (p.63). This is an example of a study in which variation in the findings might be attributed to a lack of distinction of the roles of the “inventors” participating in the study. In this particular case, perhaps there also existed systematic differences in the types of firms that engaged inventors. While Agrawal controlled for several firm attributes such as size and locality, the firm participants who contributed to the study could have been lawyers, managers, CEOs or technical managers, which would all have potentially differing motivations for desiring a certain level of engagement with a faculty inventor. Further, the previous conceptualization of inventor with the intention to “hand off” technology may provide another plausible explanation for the varied levels of engagement – the inventor may not have had any motivation to pursue a longer term relationship with an industrial participant.

Consultant

Perkmann and Walsh ¹¹ noted that inventors are often involved with companies in the licensing process of their inventions and are often hired as consultants, introducing an opportunity to distinguish between the roles of inventor and consultant. Perkmann and Walsh ¹¹ define the activity of “...academic consulting [as] the provision of a service by academics to external organizations on commercial terms...[which] may involve providing advice, resolving problems as well as generating or testing new ideas” (p. 1885). The purpose of the study by Perkmann and Walsh ¹¹ was to develop a literature-based typology for academic consulting. Perkmann and Walsh ¹¹ identified three motives for which academics might engage in consulting activities, which were driven by personal income opportunities (opportunity-driven consulting), efforts to commercialize one’s technologies (commercialization-driven consulting), and a desire for continue research with supportive firms (research-driven consulting).

Based on the previous distinctions for academic entrepreneurs and entrepreneurial academics by Meyer ⁶, a consultant could be conceptualized as an entrepreneurial academic who is interested in commercializing technology and continuing research; however, he is not necessarily driven by potential personal income gain. The decision to engage with industry as a consultant could be a desirably lower risk opportunity than entrepreneurship. For example, an academic consultant could conceivably maintain a similar lifestyle as a research faculty member without investing the additional time and resources that owning a firm would likely require. In any case, the role of consultant implies involvement beyond creating and inventing a technology and includes a vested effort of a faculty person to continue in an engagement relationship so that the technology moves forward toward commercialization/dissemination. Another distinction that could be noted is the implication of a “tangible” development associated with inventing. This

may or may not be the case for consulting, where a development could clearly be either tangible or intangible.

Conclusion:

Studies that do not consider theoretical, individual role distinctions among research faculty in UIRPs are likely to yield findings that are confounded due to the unaccounted differences among the sample participants. As an initial step toward developing a role-based theoretical model, a clear distinction of the types of roles in the context of collaborative research activities should be specified when studying participants at the individual level in UIRPs. Subsequent steps should involve the following: expanding the university affiliated roles beyond the researcher to include administrative roles such as deans, department heads, and technology transfer office personnel; and identifying roles of industrial participants in the context of the variety of companies/corporations which actively collaborate with universities.

A role-based theoretical model can be useful for researchers and practitioners as a precursor to studies that describe the types of relationships between individuals, which are relevant to the work they conduct in university-industry research partnerships. A key factor in improving university-industry research partnerships is our understanding the nature of the roles and relationships among the individual partnership participants. Clarifying these roles will be helpful for moving forward with a more focused research agenda for university-industry research partnerships.

Bibliography

1. President's Council of Advisors on Science and Technology [PCAST], 2008. University-Private Sector Research Partnerships in the Innovation Ecosystem: Report of the President's Council of Advisors on Science and Technology
2. Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., ... & Sobrero, M., 2013. Academic engagement and commercialisation: A review of the literature on university–industry relations. *Research Policy*, 42(2), 423-442.
3. Jain, S., George, G., Maltarich, M., 2009. Academics or entrepreneurs? Investigating role identity modification of university scientists involved in commercialization activity. *Research Policy* 38, 922–935.
4. Rothaermel, F.T., Agung, S., Jiang, L., 2007. University entrepreneurship: a taxonomy of the literature. *Industrial and Corporate Change* 16 (4), 691–791
5. Louis, K.S., Blumenthal, D., Gluck, M.E., Soto, M.A., 1989. Entrepreneurs in academe: an exploration of behaviors among life scientists. *Administrative Science Quarterly*, 34, 110–131
6. Meyer, M., 2003. Academic entrepreneurs or entrepreneurial academics? Research-based ventures and public support mechanisms. *R&D Management* 33, 107–115
7. Stuart, T.E., Ding, W.W., 2006. When do scientists become entrepreneurs? The social structural antecedents of commercial activity in the academic life sciences. *American Journal of Sociology* 112, 97–144
8. Bercovitz and Feldmann Bercovitz, J., Feldman, M., 2008. Academic entrepreneurs: organizational change at the individual level. *Organization Science* 19, 69–89
9. Di Sante, A.C., (2007). The role of the inventor in the technology transfer process. In *Intellectual property management in health and agricultural innovation: A handbook of best practices*, (eds. A Krattiger, RT Mahoney, L Nelsen, et al.). MIHR: Oxford, U.K., and PIPRA: Davis, U.S.A. Retrieved online from: <http://www.iphandbook.org/handbook/ch05/p05/> on 3-17-15
10. Agrawal, A., 2006. Engaging the inventor: exploring licensing strategies for university inventions and the role of latent knowledge. *Strategic Management Journal* 27, 63–79
11. Perkmann, M., Walsh, K., 2008. Engaging the scholar: three forms of academic consulting and their impact on universities and industry. *Research Policy* 37, 1884–1891