e-Leadership in Academia: A New Form of Leadership Emerging from Networks of Interdisciplinary Research

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Abstract:

The nature of leadership in academia is becoming part of the shift in the "network society" (Castells, 2000). 24 academic leaders from the University of Oxford were interviewed in this study in order to understand what "e" actually means in the concept of e-leadership. e-Leadership in academia can be seen as one kind of leadership in academic e-contexts. The e-contexts, accompanied by the use of new technologies in academia, are not online communities, but networks of research, largely interdisciplinary, distributed and interconnected. It is argued that research networks of this kind are the e-contexts in which the new form of leadership needs to be reconsidered.

Key Words: Leadership, Network, Research, Academia, Technology

1. INTRODUCTION

Leadership in academia is a very distinctive concept and we knew very little about it. Higher education's distinctive combination of goals, tasks, emplyees, govenmence structures, values, technologies, and history makes it not quite like anything else (Altbach, Gumport, & Johnstone, 2001). In academia, understanding e-leadership, as one kind of interactions between academics, is not a straightforward task. Both academia and technology are highly dynamic, which makes the research task even more complicated. Technology not only consists of many different aspects at any one time, but also constantly changes over time. Likewise, academia is not simply a homogeneous community, in that there are distinctive specialties within varying research settings, again constantly developing.

This research is an example of an empirical qualitative investigation that takes on these challenges in order to explore the changing variables and unpredictable elements that have been introduced by technology into the research world. It consists of semi-structured interviews with 24 senior academics at the University of Oxford. Of these 24 senior researchers, only five were women, but this is a fair representation since HESA data (HESA, 2009) shows that only 19% professors in higher education institutions were female in 2007/08. These interviewees are leading scholars who have made significant contributions to their fields. They have been working as primary researchers for a relatively long period of time in their career, but are (at the time when the fieldwork was carried out) academic leaders in the sense that they manage a number of researchers in their fields.

The issues of technology, research endeavour, and the nature of leadership are rarely addressed together, and this study contributes to wider knowledge of what "e" actually means in the concept of e-leadership in current research settings. e-Leadership in academia is actually one kind of leadership in academic e-contexts. The e-contexts are not online communities, but tend to be real-world networks of research, largely interdisciplinary, distributed and interconnected. Research networks operate relatively independently and openly, accompanied by a constant process of change induced by network technologies. The use of technologies helps to form such research environments by providing mediated communicative forms that were not there in the past. Academics are becoming more connected. Leaders play an important role in connecting peers, and in particular building up weak ties, and as a consequence, linking up disconnected networks of research.

2. LEADERS AS INTERDISCIPLINARY RESEARCHERS

Interviewees are selected from a wide range of disciplines[1] in Social Sciences, Science and the Humanities Divisions. In the interviews, most of them, irrespective of subject matter, talked of their professional backgrounds as interdisciplinary:

> When I was an undergraduate… in mathematics… I went to one of the options, which was on difference equations, but all the examples were from biology and ecology. I thought this was very interesting… I ended up doing the DPhil with the lecturer involved. And then sort of continued from there… that's how I got involved in interdisciplinary research" (male, mathematical biology)

In some circumstances, they did not even conceptualise themselves in disciplinary terms:

> I myself am not quite sure what my discipline is. Its international relations, but international relations itself is a discipline that is interdisciplinary. So we have normative theory, philosophy, political philosophy. I never studied that systematically, but I re-did it in this area… My original field is political economy, international political economy… but then I did a lot of international law and European law, political theories, as I said, mainstream political science. Now for me, I use all of these fields to think about my issues. I always start with an issue, a problem, something in the world, that I am interested in. I am not really thinking in terms of disciplines. (female, European studies)

As interdisciplinary researchers, the majority of them are heavily involved in research work that brings disciplinary knowledge together to adequately address the issues that lie in the intersection of different disciplines. The professor of geology, for example, studies acid rain, closely working with "meteorologists, climatologists, and chemists… hydrologists, ecologists…" (male, geology). The professor of computational science, actively seeking interdisciplinary cooperation, is also heavily involved in interdisciplinary work:

> We work with departments within Mathematical, Physical & Life Sciences. We have collaborations with many of them. We also have collaborations with the Oxford Internet Institute and the business school in the social sciences. We are beginning to build up collaborations with different departments in the humanities. (female, computational science)

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[1] These include humanities, cognitive science, accelerator science, particle physics, social work, law, social anthropology, biology, mathematical biology, engineering, archaeology, physiology, internal relations, politics, geography, geology, computer science, economics, geology, comparative politics and societies, social policy, applied biology, European studies, and refugee studies. It was intended to disclose the names of the fields to help gain a better understanding of the interviewees and what they talked about in interviews, but not to reveal the identity of participants. Thus, these names above are changed in a way they reveal some information about the participants' field, but not enough to mean they can be seen to represent any particular department at the University of Oxford.

More importantly, participants highlighted in the interviews that their involvement in such interdisciplinary work has further strengthened the connection/interaction between fellow researchers.

> My real experience is in multidisciplinary and interdisciplinary work, which I would say began when I joined the [***] centre… we had a sociologist, an anthropologist, an educational specialist, a psychiatrist, and I think very much from each other as we learned from data that was produced by their research… Emails, telephone and then I have to rely on being out there quite often. So, I travelled nearly every three months, and spent a week to ten days with each team… With my co-investigator, we talk each week. By email, I am in touch with my team almost on a daily basis. (female, social anthropology)

The interview accounts illustrated that interdisciplinary work is generated by increasing specialisation, as well as the complexity of the problems that need to be solved in many fields of research. As more complex research problems need to be solved, the undertaking of individual research work become progressively more refined and specialised. Consequently, increasing specialisation leads to the development of more sub-fields, and the increasing complexity of research problems entails more connections between each sub-field.

Interdisciplinary research, as the driving force, brings academics together to work, highlighting the importance of those interconnections between disciplines. The interplay between researchers from different disciplines is therefore emphasised in interdisciplinary settings. There is evidence in this study that the development of interdisciplinary research does not lead to the blurring of the boundaries between disciplines, but rather significantly promotes the interplay between them. The orientation towards interdisciplinarity does not mean that the boundaries of disciplines are no longer important. This is contrary to the suggestions that the boundaries of disciplines are often weakened by heightened interdisciplinary work (such as James' work (James, 2005)). What interdisciplinary research advances are in fact the interconnections between different disciplines. By emphasising such interconnections, what technology introduces to interdisciplinary settings falls into the issues with regard to the creation of connections between researchers from different disciplinary backgrounds.

3. NOT YET A PURE "E" CONTEXT

In academia, all forms of scholarly practice have, to some extent, changed with the increasing use of new technologies (Lynch, 2008). Email, the web, blogging, e-journals, and Skype are but a few of these new technologies that affect virtually all forms of scholarly activities in academia (Nentwich, 2003). More distributed, networked, interoperable technologies are clearly changing the research world (Voss et al., 2007). Many of academic interactions occur via electronic linkage. More information is now shared over wider channels at a distance. Research communication has been, in a quantitative way, changed by technology use. The use of technology has potentially led to more distributed research. Distributed research is a fashion. Network technology is used for enabling distributed work. With the new communication

channels mediated by network technology, face-to-face contact seems to no longer be indispensible for many aspects of research work, e.g. "(i)n the age of emails, computer networks, I am sure it's perfectly possible" (female, Politics). As a consequence, a large volume of people's research is now conducted at a distance.

As Atkins notes, "New technology-mediated, distributed work environments are emerging to relax constraints of distance and time" (Atkins, 2003, p. 9). When network technology is widely used in this digitalised world, people are "unlocked from the shackles of fixed and rigid schedules, from physical limitations" (Salmon, 2003, p. 11). Academics now conduct their research "without regard to geographical location – interacting with colleagues, accessing instrumentation, sharing data and computational resources, and accessing information in digital libraries" (Council, 1993, p. 7). Notwithstanding formalised collaborations that link scholars who are geographically dispersed (Finholt, 2002), more prevalent are informal networks between academics associated with different universities across the globe(Koku, Nazer, & Wellman, 2001).

In the interviews, research networks are conceptualised by participants as connected research settings where academics interact with each other. Via electronical means, academics are, to some extent, connected with each other. In networks of research, a common paradigm of interdisciplinary research, shared by several researchers, involves academics with different specialities working together on collected research tasks contributing different specialities. At the individual level, academics work on separate parts of the task on their own, while at the collective level, each of these separate parts joins together and contributes to knowledge building.

Such a structure has been advanced in a certain way, accompanied by the use of network technology in research. Nevertheless, it is important to point out that, in talking of their research networks where they are becoming informally bound by the value of researching, participants did not think to connect their research networks to any of the networking sites. Many participants, such as the professor of computational science, claimed, "I personally don't participate in social networking sites" (male, computational science). A few participants, with online professional networks, found that their online professional networks only made their own research connections public online.

> I have just got started with LinkedIn, which is about making professional connections. I linked to people and I find out other people who linked to them that I know. I linked to them. Suddenly I have 70 people there now. Half way through it I wondered why I was doing it. I am only linking to people I know… I am making those connections public, but I confess that I haven't actually gained anything from it yet. (male, computer science)

The Reader of social anthropology belongs to a social networking site in her field. She is not actively involved in it, instead, she seemed to use it as email:

> There is a very similar social network that's called [***]. So it's anthropologists and on it they have group interests. I've registered and we've passed a few messages back and forth but I don't have time to check. I only check when I get messages telling me someone has sent something to me. (female, social anthropology)

In the interviews, the majority of the participants showed their disregard for professional networking sites. Distributed research that is enabled by network technology is still at a distance, which is by nature different from collocated work that is conducted by researchers located in the same research office. This echoes a general view found in the literature that distance has not been altered by technology (Cramton, 2001; Herbsleb, Mockus, Finholt, & Grinter, 2000; Hinds & Bailey, 2003; Zhang, 2008). As for the possibility of working with geographically dispersed researchers by using network technology, the perceived distance between academics is perhaps, to a certain degree, shortened. That is, the concept of distance can be seen to have changed in that academics are able to work together via mediated communication across the globe. In fact, distributed research to some extent involves a certain degree of face-to-face contact. This evidence suggested that distributed research and collocated research are not entirely separate; as a matter of fact, distributed work usually involves both researchers who are geographically dispersed and colleagues nearby. Likewise, real-world research seems to always involve a mix of collocated work and distributed work.

4. E-CONTEXTS: NETWORKS OF RESEARCH

In talking of the factors that had led to the perceived success of their academic career, virtually all of the respondents made reference to their research networks. Unlike online professional networking sites, these networks are informally bound by the value of researching. In the case of the professor of European studies, she explicitly declared that she has three major research networks formed by working with colleagues in the US, EU, and Oxford throughout her career:

> I have a network that exists from when I was a doctorate student… A very important network now that I've been 10 years in Oxford of course, and all the colleagues I had in the United States at Harvard. (female, European studies)

The professor of international relations also belongs to several research networks. His level of engagement in each of these networks varies:

> Sometimes, you will be part of that; other times, you won't. Sometimes I've been in several projects at once as sort of a consultant, that kind of commentator… sometimes I am not able to participate in this… (male, international relations)

The professor of geography stated that, in his research networks, some of them work together intensively, and some, perhaps bearing mutual interest and understanding in mind, only engage in collaboration occasionally. A number of respondents operate their research networks in a similar manner. As shown in the interview accounts, in certain networks some participants work intensively with others face-to-face (involving a great amount of travelling). Some work

independently while staying in touch with fellow researchers via emails. Some tend to work more closely with each other only in the event of a crisis, such as when confronting a major technical problem or a failed experiment.

As we can see, the research world fostering leadership has changed to such an emerging research setting that appears to be the one that includes numerous research networks, which to some degree interconnect with each other. Each individual researcher belongs to one or more research networks, and plays different roles within each. In each individual network, the level of engagement of researchers in research activity differs. Some researchers play a key role in one network, while simply being associated with another network. While being associated with several research networks, they are able to choose the extent to which they engage in the research activities of each network. Academics are somehow connected to fellow researchers in a way in which they can work together intensively or sometimes perhaps they, bearing mutual interest and understanding in mind, only keep in touch with others.

It has also been reported in the interviews that research networks, which include researchers from different disciplines, overlap or are intertwined. In the literature, metaphors such as "overlapping neighbourhoods" (Polanyi, 2000, p. 7) and "fish scales" (Campbell, 1969, p. 328) have been used to describe a general pattern of research communication across disciplines. In spite of the intricate correlation between research networks, each network in fact operates independently. Although they are members of a number of research networks, their work in some networks is less demanding. This ensures the degree to which individual researchers engage in each network. The network draws people together, if that is what they choose, or perhaps people are scattered into a million communities (Gates, Myhrvold, Rinearson, & Domonkos, 1996).

What's the role of academic leaders in these research networks? While admitting the importance of being pioneer in research work, interviewees, as a leader in research, tend to regard themselves as research manager/enabler.

> … As I sort of matured research wise, inevitably you create a network without thinking
> about it. A body like ESRC and any other councils encourage and provide opportunities
> for the development of formal networks… I think the more senior you get in the system,
> what you do as a researcher changes quite dramatically… You become more research
> manager, much less research doer. (male, geography)

In a similar way, the professor of archaeology perceived himself as an "enabler" or "the producer of the film". He stated that he is the person who "puts together all the money and organises things", but the whole creative side is produced by all "the actors and the actresses" in his metaphor. Being in such an academic position, he maintains wide contacts as well as act as the focal point in his research network. In particular, being a leader in research, they are willing to help younger generations to develop. More examples from the interviews illustrated

that interviewees, as leaders in research, see themselves as being the ones directing varied academic interactions in all sorts of research networks.

What they commonly share as academic leaders, is that they are less research doers but someone who bring the team all together, have the vision. Actively interact with others, help others to make connections, and take care of junior researchers. That is to say, academic leaders tend to play an important role in building up weak ties. The setting of interconnected research networks is seen to be steered by academic leaders. Addressed by a number of participants in this study is that some research networks to which they belong are found to be disconnected. Participants pointed that it is the academic leaders that link up disconnected networks of research. Based on Burt's (1992) network theory, in higher education constructing research networks consisting of disconnected research groups is a way of promoting joint work. Most participants of this study genuinely believed that leaders help to bridge the disconnected networks, and it is the interconnected research environment that generates potential collaborative research.

As stated earlier, many scholars in the interviews used "network" to describe the setting of their current research environments. Doing research, or more specifically interdisciplinary research, leads to dynamically embedded interactions with a range of academics, and further ensures the formation of research networks connecting scholars from different backgrounds. Wellman (2002) also argued that old-fashioned research environments have moved from being "hierarchically arranged", "densely knit" and "bounded groups" to network settings (p. 91). They no longer fit the group model, which is small and clearly bounded. In networked societies, "boundaries are more permeable, interactions are with diverse others, linkages switch between multiple networks, and hierarchies are flatter and more recursive" (Wellman & Hampton, 1999, p. 1).

5. CONCLUSIONS

The nature of leadership in academia is becoming part of the shift in the "network society" (Castells, 2000). This qualitative study shows that, accompanied by the use of new technologies in academia, networks of research are formed, largely interdisciplinary, distributed and interconnected. It is argued that research networks of this kind are the e-contexts in which the nature of leadership needs to be reconsidered. The new concept, e-leadership in academia, is actually one kind of leadership in academic e-contexts. The topic of e-leadership should be discussed in e-contexts, that is, real-world research settings (can be either at a distance or face to face). To study e-leadership in academia, its research settings need to be taken into account. In this networked society, that is to say, studies of leadership in academia can neither be constrained in distributed work among physically dispersed scholars, nor narrowly focused on how leadership is formed in multimedia-supported collaborative work in an online platform.

REFERENCES

[1] Altbach, P. G., Gumport, P. J., & Johnstone, D. B. (2001). In defense of American higher education (p. 364). Johns Hopkins University Press.

[2] Burt, R. (1992). Structural holes: The social structure of competition.

[3] Castells, M. (2000). The rise of the network society: The information age: Economy, society, and culture (pp. xxix, 594 p.). London: John Wiley and Sons.

[4] Council, N. R. (1993). National Collaboratories: Applying Information Technology for Scientific Research. Washington, DC: National Academy Press.

[5] Cramton, C. D. (2001). The mutual knowledge problem and its consequences for dispersed collaboration. Organisation Science, 12(3), 346-371.

[6] Finholt, T. (2002). Collaboratories. Annual Review of Information Science and Technology, 36, 73–107.

[7] Herbsleb, J. D., Mockus, A., Finholt, T. A., & Grinter, R. E. (2000a). Distance, dependencies, and delay in a global collaboration. In Proceedings of the 2000 ACM conference on computer supported cooperative work.

[8] HESA. (2009). HESA data shows increase in proportion of female professors. Press release 131 [Web page]. Retrieved from http://www.hesa.ac.uk/index.php/content/view/1397/161/

[9] Hinds, P. J., & Bailey, D. E. (2003). Out of sight, out of sync: Understanding conflict in distributed teams. Organisation Science, 14(6), 615-632. doi:10.1287/orsc.14.6.615.24872

[10] Gates, B., Myhrvold, N., Rinearson, P., & Domonkos, D. (1996). The road ahead. New York, NY: Penguin.

[11] James, N. (2005). Academic identity development: Narratives of shifting experiences. Centre for Labour Market Studies, University of Leicester.

[12] Koku, E., Nazer, N., & Wellman, B. (2001). Netting scholars : online and offline. American Behavioral Scientist, 44(10), 1752–1774.

[13] Lynch, C. (2008). The institutional challenges of cyberinfrastructure and e-research. EDUCAUSE Review, 43(6), 74–88. EDUCAUSE. 4772 Walnut Street Suite 206, Boulder, CO 80301-2538. Tel: 303-449-4430; Fax: 303-440-0461; e-mail: info@ educause. edu; Web site: http://www. educause. edu.

[14] Nentwich, M. (2003). Cyberscience: Research in the age of the Internetesearch in the age of the Internet (pp. xxii, 490, 79 p.). Vienna: Austrian Academy of Sciences Press.

[15] Campbell, D. T. (1969). Ethnocentrism of disciplines and the fish-scale model of omniscience. In M. Sherif & C. Sherif (Eds.), Interdisciplinary relationships in the social sciences. (pp. 328-48). Chicago, IL: Aldine.

[16] Wellman, B. (2002). Designing the Internet for a networked society: Little boxes, glocalisation, and networked individualism. Communications of the ACM, 45(5), 91-96.

[17] Wellman, B., & Hampton, K. (1999). Living networked in a wired world. Contemporary Sociology, 28(6), 648-654.

[18] Polanyi, M. (2000). The republic of science: Its political and economic theory. Minerva, 38(1), 1-21.

[19] Salmon, G. (2003). e-moderating: The key to teaching and learning online (pp. xiv, 242). London: Routledge.

[20] Voss, A., Mascord, M., Casteleiro, M., Asgari-Targhi, M., Procter, R., Fraser, M., Jirotka, M., et al. (2007). e-Social Science Conference. e-Infrastructure development and community engagement.

[21] Zhang, J., Davies, C., Yokoyama, S., & Miyadera, Y. (2008). A hybrid online research instrument beyond the traditional web survey and its application. The fourth international conference on technology, knowledge & society.