



סדרת מאמרים לדיון Working paper series

No. 8 – 2011

Science policy and sensemaking: the case of research activity at the Open University of Israel

Aviad Bar-Haim

Science policy and sensemaking: the case of research activity at the Open University of Israel

Aviad Bar-Haim

Management & Economics department – Open University of Israel

Dorothy de Rothschild Campus, 1 University Road

Raanana, 43107, Israel

Abstract

The Open University of Israel (OUI) has initiated a novel project to promote its research position. The project is composed of two complementary processes: a top-down mapping of research activity by analyzing the research fields of its senior faculty members, and a bottom-up self-organizing of new research groups. The logic of this two-directional initiative is to accommodate the university's research priorities and the research interests of its academic staff. This paper is intended to show that an important part of restructuring the research profile of the OUI is a painful process of sensemaking, according to Karl Weik's theory. This is because members of the new, emerging structure are required to partially distance themselves from the conventional sensemaking of their research work, which is disciplinary and carried out within the conventional framework of specialized fields and faculties, and to devote more time and thought to interdisciplinary work. In some respects, they are required to build a new professional self-identity and values. This sensemaking process is strongly related to the top-down mapping and its methodology, and to the fact that OU researchers experience ambiguity when, on the one hand, they are surprised to discover that their work is in close proximity to the research interests of unexpected colleagues, either in their own department or in other departments, and on the other hand, they have not yet developed a new sensemaking construct in line with the long range vision of the project.

Science policy at the OUI

The Open University of Israel (OUI) is undergoing a major change from a teaching university with minor research activity to a unique model of a teaching AND research university. Conventional research universities in Israel were developed in recent decades according to the American model of research universities. The story of the University of California illustrates this mode of development (Ma, 2008, 67):

After World War II, the growth of population in California brought a great opportunity for the university. In 1952, the traditional institution became a university system with multiple campuses. Especially with the help of federal loans and money from state reserves, the university constructed a chemistry building and established the School of Forestry in 1946... Other areas of expansion included biochemistry, virology, and molecular biology in 1948 and 1964. The campus expansion no doubt helped to host more academic programs and departments. In addition, the University established the Survey Research Center, opened the Institute of Industrial Relations, and created the Institute of Transportation and Traffic Engineering during that period.

However, at the present time higher education institutions everywhere are experiencing serious problems of budgeting and difficulties in sustaining their research activity. Universities are required to reduce expenses, to operate more efficiently and produce more relevant and useful research products. Coping with the crisis has many facets. For example, the *Economist* (10 September, 2005) in an article by Wooldridge, coined the term "global research universities". He observed the emergence of a "super-league of global universities", which regard the whole world as their stage, but are still committed to the ideal of a community of scholars who combine teaching with research (Ma, op. cit, 65-66).

For the rest of the world of learning, which is not in the super-league, a major change of science policy (SP) is still called for. For example, Sarewitz, (2007) asks openly whether Science Policy matters in the current policies and practices of research

budgeting, and Graffy (2008) suggests a FOSI (Functions of Scientific Information) model to link science and policy in capacity-building in R&D units.

For the OUI to enter seriously the research business will take a major strategic change in its science policy. Important steps in implementing this new SP have been marked in the standards for recruiting new faculty members, in stimulating applications for competitive research grants and in the increasing growth of winning research grants from top research funds (NSF, GIF, the EU research programs, and so forth).

Alongside these familiar practices to encourage research, the OUI has initiated a novel project to promote research activity. The project is composed of two complementary processes: a top-down mapping of the research activity at the OUI by using the self-descriptions of the research fields of the faculties in their websites; and bottom-up self-organizing research groups and teams in response to an internal "call for research groups" from the university's research authority. The logic of this two-directional initiative is to optimize the university's missions and the research interests of its academic staff – not a trivial task in an organizational culture of academic freedom and collegial norms of work and management. The specific expected outcomes of this project are: (a) to map research clusters, which will serve as centers for interdisciplinary work among OUI researchers in several research and organizational configurations; (b) to attract research funds to the potentiality of the unique opportunities of these research clusters from a variety of resource sectors (government, market, and not-for-profit foundations)¹.

I shall here briefly describe some technical details of this project. I shall then attempt to show that at the core of this project is an experiment in expanding the current sensemaking of the research work of the faculties of OUI, from focused disciplinary research in specialized fields to a pattern of sensemaking that includes interdisciplinary research work.

¹ The selective focuses of research fund-raising in this structure can be enhanced according to the model of Crow and Bozeman (1987), which combines type of research product (generic, balanced and proprietary), and level of governmental funding influence.

Top-down mapping of research clusters

The first task in the top-down process was to identify valid aggregates or clusters of research work at the OUI. This was accomplished by a heuristic content analysis of the semantic fields of the self-descriptions and key words in the websites of the researchers. This analysis produced the following eight clusters:

1. "Computational and formal thinking in science and behavioral sciences"

This cluster maps most of the research work in computer science, game theory, and mathematics.

2. "Cognition, learning and education"

This charts research work in cognitive psychology, the philosophy of learning, education (processes, methods – including learning technologies), and cognitive science of brain research (neurobiology and neuropsychology).

3. "Cultures, peoples and societies"

This cluster maps a variety of research work in culture studies, literature, archeology, Jewish philosophy, communication studies, arts, and cinematography.

4. "State, economy and organizations"

This maps many research studies in political science and political sociology, including democracy and the study of other regimes, political economy, labor relations, civil-military relations, state-civil society relations, business and public administration.

5. "History of religions, ideologies, science and communities"

This cluster charts a diversity of research work on Judaism, Islam, Christianity, communism, Zionism, Palestinians, colonialism, post-modernity, colonialism, post-Zionism and other movements that have an impact on peoples and communities.

6. "Managing human and non-human systems"

This maps research work on management and managing human, non-human, and organizational systems in business and public sectors, technical, professional, and logistic systems, such as information systems, engineering systems, medical systems, research and development systems and military and security systems.

7. "History, philosophy, sociology and psychology of identities, emotions, morality and values"

This maps research work on morality, social and national values, memory and personal, cultural, and national identities and encounters of individuals and collectives.

8. "Matter, life and environment"

This maps research work in natural and life sciences, psychology and education (often, but not only) oriented to experimental and laboratory exploration of the secrets of the universe, life and the interaction between life and various environments (physical, including climatic, geological, biological, geographical, urban and technological).

The second task was to assign a research profile to every researcher by coding his membership (code 1) or non-membership (code 0) in each of the eight clusters of the profile. Thus, for example, a researcher could have, according to his or her self-description, a research profile **00101010**, namely, he or she works in the research fields of clusters 3, 5, and 7 (see above for the labels and definitions of these clusters).

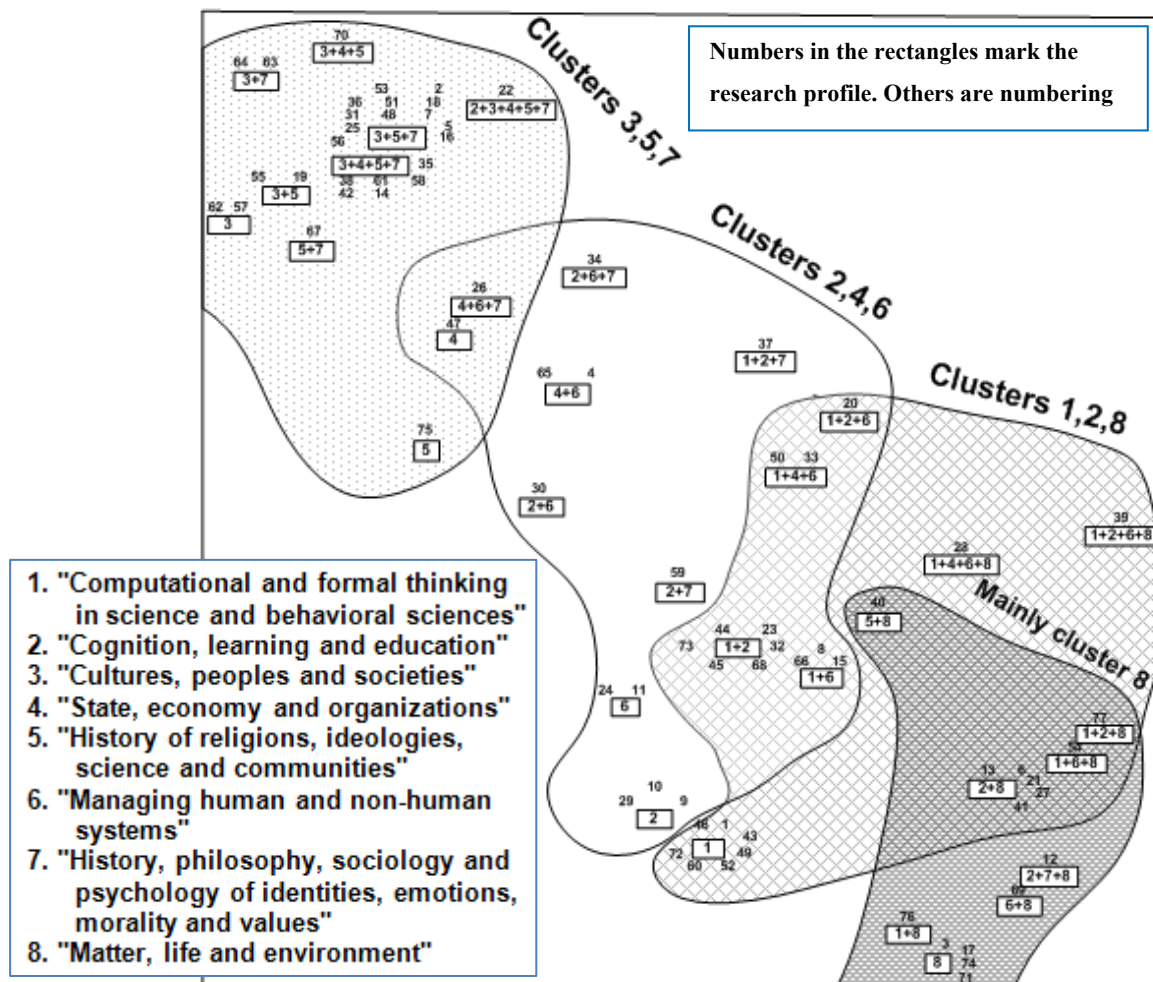
The third task was to map the relationships among the research profiles. This was done by a statistical mapping procedure that was applied to the data set of 77 eight-item research profiles. The mapping target was to show the relative position of profiles to each other. This is crucial because the mapping process has to be meaningful and relevant to every member of the research community of the OUI. This personal dimension is important for members to locate themselves in the research space of their institution, to discover potential co-workers in research projects, to develop fruitful discourse in their fields and to accumulate a critical volume of valuable research work.

The task was accomplished by non-parametric weak monotonicity correlations (MONCO), and a non-parametric profile analysis of partial order scalogram analysis with base coordinates (POSAC).² The obtained graphical map of distances among the

² Performed by procedures 'Monco' and Posac' of HUDAP (Hebrew University Data Analysis Package), Release 6.0. In this technique, the correlation matrix of the profiles is transformed into Euclidean distances, where the relative distances are smaller as the correlations are higher. In an

research profiles is displayed in Chart 1. We get 33 research profiles from among 77 members.³ Some people have a research profile with a single element; others have more elements in their research profile (2-5). There are profiles that characterize a single researcher, and other profiles that characterize several researchers (2-12). All the research profiles are assembled in four main regions or "super-clusters" on the map with some overlapping (the colors are not seen in a B&W presentation): "Blue" region (mainly clusters 3, 5, and 7), "Green" region (mainly clusters 2, 4, and 6), "Yellow" region (mainly clusters 1, 2, and 8), and "Brown" region (mainly clusters 1, 8).

Chart 1: Top-down mapping of 77 research profiles at the OUI by partial order scalogram analysis (POSAC)



exploratory study, where knowledge about the behavior of the distributions of the investigated phenomenon is limited or non-existent, this non-parametric approach is more appropriate.

³ In a profile of eight binary elements there are 2^8 (512) possible profiles.

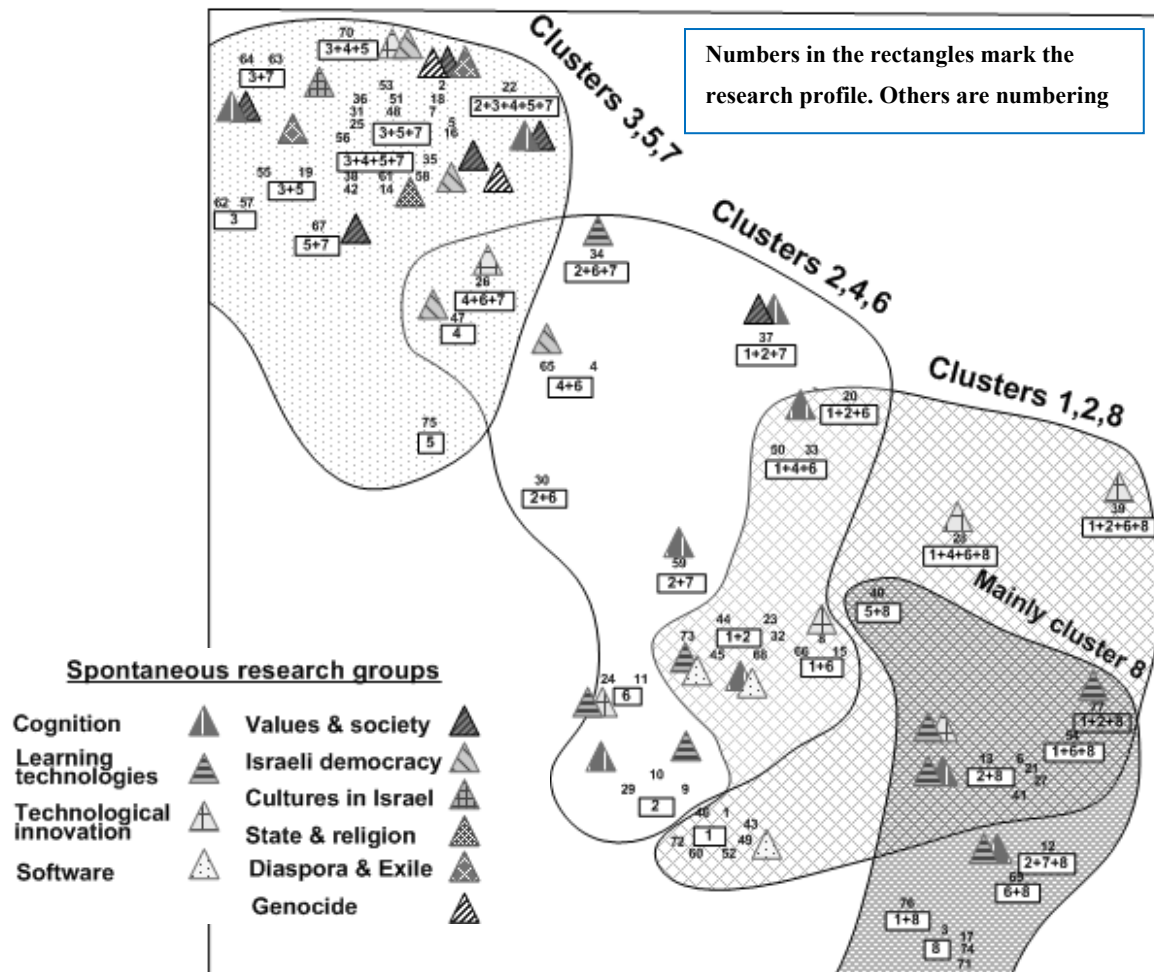
Bottom-up mapping of spontaneous research groups

As noted before, the whole project is a top-down AND bottom-up dual process mapping of self-organizing research groups and teams, in response to an internal "call for research groups that yielded 10 groups. The bottom-up mapping was accomplished by "imposing" those 10 research groups on the cluster map (see chart 2):

1. Cognition.
2. Learning technologies.
3. Technological innovation.
4. Software.
5. Values and society.
6. Israeli democracy.
7. Cultures in Israel.
8. State and religion.
9. Diaspora and exile.
10. Genocide.

It can be seen that some of the research groups belong to the same "super cluster" or related fields, while others cross domain and faculty borders, and are truly interdisciplinary fields of research. This is more striking when we "impose" these research groups on the top-down map, as is displayed by triangles in the chart.

Chart 2: Bottom-up mapping: imposing 10 spontaneous research groups on the cluster map



Inter-disciplinary research as a sensemaking problem

Karl Weick in his seminal paper (ASQ, 1993) explains the mechanism of sensemaking by negation- at a time of disaster, when active organizing routines and leadership collapse and the lack of orientation and meaningful instrumental action puts organizational survival at risk. In this critical period, weak inter-subjective communication is a pre-condition of organizational collapse, which in its turn causes panic (an old Freudian observation: in the absence of social and organizational support, the outburst of restrained fears becomes a real possibility). In short, catastrophes dismantle organizational sensemaking. On the other hand, in normal times, sensemaking is built on organizational routines, roles and decision-making that have rational meaning, and people can trust co-workers' judgments and opinions, because they are in an accepted and known context of inter-personal relations and experience.

However, as Millsa and Weatherbeeb (2006) show, an effective inter-organizational response requires shared meaning (Weick & Roberts, 1993), which can only result when there is a convergence of both inter- and intra-organizational sensemaking. Relating to this convergence is organizational identity as a critical element in the sensemaking process.

Mullen, Vladi and Mills (2006) indicate that Weick (1995) provided a framework that has helped to improve our understanding of how an individual's identity influences enactment and sensemaking in organizational crises. However, testing of the theory of sensemaking has been almost totally confined to disastrous events, and in a negative mode, namely, the collapse of sensemaking. When an attempt is made to apply the theory in a less dramatic and traumatic context, we need to consider the time dimension. This is studied and discussed extensively by Weick and Quinn (1999) in a different setup of organizational change – spontaneous versus planned change. In normal times, both spontaneous and planned change requires time, and so does the building of a new pattern of sensemaking. Perhaps this is more difficult to do, because the existing pattern works and controls the daily routines, practices and behaviors in Lewinian terms, namely, the field of meanings and identities is frozen.

The research project of the OUI displays properties of both spontaneous and planned change of meanings and identities. The bottom-up research activities are mostly spontaneous and organized around established practices of disciplinary fields of research. These organizing activities strengthen the traditional academic disciplinary identity and sensemaking. This also enhances the status quo ante for university faculty members, who are pushed to excel both qualitatively and quantitatively in disciplinary research and publication.

On the other hand, the top-down efforts of the project emphasize a different locus of identity and sensemaking. They are aimed at research collaboration between researchers from different fields and disciplines. Time, intellectual and material resources are required to change a pattern of sensemaking in this direction. Perhaps we need some time to create a research environment that facilitates both disciplinary and inter-disciplinary co-existence. At these initial stages of the project, researchers at the OUI are experiencing ambiguity - feelings of surprise to discover that their work is in close proximity to the research interests of unexpected colleagues, either in their own department or in other departments, and a new sensemaking that is unfamiliar to faculty members with a strong disciplinary identity.

Temporary epilogue

The mapping project of the research activity at the Open University of Israel started in 2009. So far, three new research institutes have been established: the Center for the Study of Relations between Jews, Christians and Muslims, which attracts researchers from the top-down "blue" region (clusters 3, 5 and 7); the Research Institute for Policy, Political Economy and Society, which brings together researchers from the top-down "green" region (clusters 2, 4 and 6); and the Research Center for Innovation in Learning Technology, which attracts researchers from the bottom-up spontaneous groups of learning technologies and innovative technologies (see chart 2).

This is an ongoing project and we must wait and see, while continuing to observe, record and gain insights into the dynamic development of this project as it evolves.

References

- Crow, M. M., and Bozeman, B. L. (1987). A New Typology for R&D Laboratories: Implications for Policy Analysts. *Journal of Policy Analysis and Management*. 6(3), 328-341.
- Graffy, E. (2008). Meeting the Challenges of Policy-Relevant Science: Bridging Theory and Practice. *Public Administration Review*, 68(6), 1087-1100.
- Ma, W. (2008). The University of California at Berkeley: An Emerging Global Research University. *Higher Education Policy: World-Class Universities*. 21(1), 65-81.
- Millsa, J. H. and Weatherbeeb, T. G. (2006). Hurricanes Hardly Happen: Sensemaking as a Framework for Understanding Organizational Disasters. *Culture and Organization*. 12(3), 265–279.
- Mullen, J., Vladi, N. and A. J. Mills (2006). Making Sense of the Walkerton Crisis. *Culture and Organization*. 12(3), 207–220.
- Sarewitz, D. (2007). Does Science Policy Matter? *Issues in Science and Technology*. 23(4), 31-38.
- Weick, K. E. (1993). The Collapse of Sensemaking in Organizations: The Mann Gulch Disaster. *Administrative Science Quarterly*. 38, 4, 628-652.
- Weick, K. E. (1995). *Sensemaking in Organizations*, London: Sage.
- Weick, K. E. and R. E. Quinn (1999). Organizational Change and Development. *Annual Review of Psychology*. 50, 361-86.
- Weick, K.E. and K. H. Roberts (1993). Collective Mind in Organizations: Heedful Interrelating on Flight Decks. *Administrative Science Quarterly*. 38(3), 357–381.