Discussion

Managing Creativity in Academic Research

How Could Creative Action and Management Be Reconciled in Research?

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This article discusses how management could be used in promoting creativity in academic research. First, research management is introduced with the observation that management often creates tension in academic research. Second, a comprehensive research management model is presented as a tool for analysis. Third, studies of creative and innovative working groups are applied to academic research management. Finally, a conclusion is drawn with six implications for the improvement of creativity supported by research management.

Keywords: creativity, academic research management, working groups.

Management is about getting things done. Hence research management is to get research done. This means that research should be managed in such a way that creativity and performance in research is promoted. Traditionally management is a tool for producing things and services in organizations. It deals with effective leadership and organization of production and work processes. Furthermore, management is to a large degree concerned with human resources and work tasks. Research management is about individual and collectives of researchers, because they are the creators and carriers of knowledge. As Merton (1942) remarked, research is dependent on knowledge which is created and exchanged by researchers in a collective task. This reasoning leads to the observation that research management more than in perhaps any other management domain should take into account researchers' needs, their working behaviour, as well as their own social and intellectual organization (Whitley, 1974).

It is important to discuss research management for a number of reasons.

One is of course the massification of higher education (Gibbons, 1998; Kivinen and Sakari, 1999) and the enormous amount of research that is carried out in the present time. Such large scale research requires new forms of organization and management, both at the level of individuals and research groups because of the large numbers of researchers and the amount of new knowledge they create. A second reason is that during the last three to four decades research has turned into an activity that is done in a new way, as projects. Among others, Ravetz (1996) and Ziman (1994; 2000) stressed this as a characteristic of modern science. It is likely that this situation has increased the need for management of research at universities in comparison with the time when professors and their students carried out research without (or with little) external funding and when management and time pressures were of little concern or at least not much attended to (Ravetz, 1996; Ziman, 1994). Project research requires a management style where deadlines are more important, where research is more clearly divided into working stages, where research is more fragmented and where researchers' time and autonomy is more limited than before. The task of fund raising for projects has become vital for research to be pursued and must be managed. Third, there is also increasing collaboration between researchers (Hicks and Katz, 1997; Ravetz, 1996). This is a collective activity that calls for more planning of research, increasing leadership activities, distribution of tasks and co-ordination of staff. The crucial question which is posed in this article is whether this increasing management demand could be employed to promote creativity in science rather than restraining it.

Research is about creating new knowledge. Without creativity there are no scientific breakthroughs, no inventions and no innovation (and of course no art, music, fiction but these areas are not treated here). The most widely used definition of creativity is the generation of *novel and useful* products (Mumford and Gustafson, 1988). This means that creativity is crucial to research because it is the ultimate goal of research activities to result in novel findings and in the end also in usefulness (Sternberg, 1999).

As research is an activity performed by humans, increasingly done in teams and within organizations, there is also a need for management that co-ordinates research work. This is often denied by academic researchers (Pelz and Andrews, 1966), who regard management as a constraint for creative acts. Of course, this is in many cases an apt description of today's huge university organizations, particularly if management is carried out as if research was similar to any working activity[1]. A common argument from researchers that resist management is that research and creative processes demand the greatest amount of freedom to be successful (Pelz and Andrews, 1966; Ylijoki, 2005) and hence are opposed to management. From this line of reasoning, it appears that creative research and management are conflicting. However, here it is argued that academic research management could support, enhance and stimulate research and creativity, if management is used wisely as a tool in research. This is also supported by some authors, who have found in literature reviews that management is part of the

characteristics of the creative research environment (Bland and Ruffin, 1992; Hemlin *et al.*, 2004; Premfors, 1986).

The objective to enhance creativity in academic research by management gives rise to at least two research questions. The first question concerns the relation between research and management. A typical attitude in academia is, as was suggested above, that management is not needed in research, because researchers must follow their own minds and organize activities freely by themselves without considering management. Here this assumption is scrutinized and it is shown that management actually is a necessary part of the research process. The second question concerns what could be done to increase creativity by means of management in academic research organizations and particularly researchers' own management of research.

The structure of the rest of this article is as follows. First, creativity in research is shown to include a good deal of management issues. Second, research in work and organizational psychology shows that the promotion of proactivity and innovation in workplaces is becoming important. Finally, the article ends with six implications for converting management into a tool for enhancing creativity in academic research.

Characteristics of Academic Research Leading to a Certain Kind of Management

What is typical of a researcher's activity in contemporary academic research? Senior researchers, to a great extent, *manag*e research by leading co-workers, the research group, as well as participate in leading the research unit or department s/he belongs to. The typical research activities s/he carries out could be summarized in six categories[2]. The first one entails choosing problems, posing research questions, reading literature, designing studies, performing experiments, collecting and analysing data, reporting and disseminating results, and interacting with users. Particularly the last two points have become a more pronounced part of research nowadays, partly as a result of the changed social contract for science and society resulting in accountability pressures (Ernø-Kjølhede *et al.*, 2001; Martin *et al.*, 1996; Ziman, 2000). Second, research funding in general and the applications for and management of research grants in particular are important tasks for most researchers when research is done as projects. This part of a researcher's activity is no doubt increasing (Ziman, 1994). Third, the management of human resources is crucial in research, where individual competence is so basic. It concerns recruiting staff, hiring junior and senior researchers, as well as engaging doctoral students and guiding them in research. This calls for management skills which researchers seldom have been trained for[3]. Fourth, teaching is a necessary scholarly activity for university researchers. In contrast to researchers in industry and in research institutes, this is an activity that is more or less integrated into research (Frederiksen *et al.*, 2004). In universities there is a sharp divide between graduate and post-graduate teaching, where only the latter is well integrated into research. Researchers are teachers and supervisors to post-graduate students and select their potential colleagues from this

group. Fifth, participation in the management of research departments (and for some even the management of universities) is a responsibility of senior scientists. This might typically concern the discussion of the department's and the university's general scientific objectives, economy and the wider frames for management of staff and resources. Sixth, researchers are engaged in quality control by peer reviewing, examination tasks and by participating in large scale research evaluations.

In sum, researchers must be able to manage a number of tasks to be successful, hence creative. It may even be difficult to separate research from management, since research is very much about planning what to do, in what order to do it, when to do it and about being able to handle many pressing tasks (including making decisions) in a short period of time. These questions are clearly management issues, although carried out in research. On the other hand, research tasks, such as reading, experimenting, analysing data and writing articles are not research management tasks. On the basis of this analysis we could argue that research calls for a certain kind of management that should be well suited to the tasks described and also intertwined in the research process itself.

Research management could thus be viewed as a harmonizing activity between the individual input and the collective processes. This is in line with Solheim (2001) who proposed a need for increased self-management and simultaneously an increased organizational control when discussing an increased knowledge dependency in society.

A Model for Academic Research Management

Research management has been suggested to take place at three different levels where the classic academic perspective of the independent, autonomous and self-organizing academic researcher (e.g. Merton's view) is adjusted to a societally more relevant perspective where scholars are managed by societal and organizational objectives (Ernø-Kjølhede *et al.*, 2001; see also Gibbons *et al.*, 1994). Ernø-Kjølhede *et al.* (2001) propose an academic management model that comprises the individual researchers' self-management (called 1st order management); a frame management for individual researchers, i.e. organizational values and norms, as well as handling incentives and rewards (called 2nd order management); and finally, trust building and staffing (called 3rd order management). This model aims at demonstrating an appropriate balance of control and autonomy in research. More specifically, the authors argue that self-management requires the freedom of individuals to make their own decisions regarding their research (as described in the previous section), but within the limits of science and organizational needs. According to the authors, researchers voluntarily restrict themselves within these limits. This argument could be interpreted as if there are constraints for the autonomy of researchers exerted by the influence of more senior scientists, the existing paradigm and by university and departmental laws and rules. However, the claim by Ernø-Kjølhede *et al.* (2001) whether these constraints comprise and *circumscribe* research activities is not clear. If

the constraints do, they could raise obstacles for creativity. Second-order management encompasses, the authors propose, the creation of a frame and an environment that guide the individual researchers through shared values and norms. This means that a design for a self-guiding system for researchers is constructed. It should according to the authors consist of "cognitive frames, typical interpretations, organisational values and goals, and so on" (Ernø-Kjølhede *et al.*, 2001: 54). On this level, I argue, it is important that transparent decisions are made regularly by researchers about organizational (frequently departmental) values, goals, norms and their implementation to support creativity. Finally, 3rd order management encompasses 1st and 2nd order management, but also the creation and management of mutual confidence between researchers and management. The authors also add the social and cognitive composition of staffing as a key component of 3rd order management. Since 1st and 2nd order management are embedded in 3rd order management, it is, I argue, vital for creativity that management is executed within an organizational system where there is a continuous change of researchers in the leadership of the research organization.

The model summarizes, in a fairly simple but effective way, what research management is about in university research. It has some shortcomings in relation to creativity as was noted, but it is useful for the discussion of research management.

Creativity in Workplaces

A crucial concept used in creativity and innovation research is proactivity, defined as "a set of self-starting, action-oriented behaviours aimed at modifying the situation or oneself to achieve greater personal or organizational effectiveness." (Unsworth and Parker, 2003: 4). Besides the apparent relevance of proactivity to self-management (in research), it is clear that it is a driver for creativity and innovation (Henry, 2001). Furthermore, if creativity is to flourish, it is important for employees to feel capable of creative performance. It is perhaps not necessary to say that this goes also for researchers.

It is also clear that work autonomy is important for proactivity and innovation behaviours in any workplace as it is in research, but there may be individual and organizational contingency factors that moderate these effects (Pelz and Andrews, 1966). In addition, work and organizational psychologists argue that management should promote a certain amount of challenge and necessity because it may be beneficial to proactivity and innovation. This is part of the tension in organizations (Gulbrandsen, 2004) and a typical feature of the academic working field where competition is intense – "to publish or perish".

Unsworth and Parker (2003) report that that there is no straightforward link between any leadership and proactivity and innovation in workplaces. This conclusion is somewhat at odds with the literature on research environments (Pelz and Andrews, 1966; Stankiewicz, 1980), in which research leadership (especially experienced senior research group leaders) is viewed as a crucial component of the best research environments. However, supportive, encouraging and facilitating leadership increases the likeli-

hood of innovative behaviour according to reviewed studies in general workplaces by Unsworth and Parker (2003) and also by Henry (2001). At the same time, unfortunately, the former found that managers do not always welcome proactivity and innovations because their own roles might become involved. Hence, it is not a simple task to reconcile views on leadership in workplaces and leadership in research *vis-á-vis* creativity.

A climate for psychological safety, which could be described as feeling safe to take interpersonal risks, affects proactivity and innovative performance positively in general workplaces. This climate is not always present in academic workplaces where the competition for grants and positions is often strong among junior and senior researchers. Interpersonal risk-taking from juniors towards seniors might be detrimental to the junior researchers' chances of getting an advantage in a competitive environment, but interpersonal risk-taking towards other junior researchers is probably more common. A creative environment should strive to establish a psychologically safe climate in harmony with competitive challenges and risks (McClelland, 1963). The creation of such a research climate should, I argue, mainly be supplied by the research group leader, which strengthens his/her role in research management in stimulating creativity. One might also add that research environments need another kind of leadership than general workplaces. A research leader should of course be "supportive, encouraging and facilitating" as mentioned earlier, but that is not enough in research. S/he must also be a guide into the research field and process, that is, have expertise (Mumford *et al.*, 2002).

Conclusions: Six Implications for Researchers Who Wish to Reconcile Research and Management to Stimulate Creativity

A number of lessons can be learned to promote creativity in research by designing a supportive and stimulating research environment where management could be a useful tool rather than an obstacle. These lessons are summarized in the following six implications for university researchers.

People

First, it is essential for a university organization to manage the recruitment of appropriate individuals, because they are the basic components of creativity. Individuals working alone or in groups should be selected on criteria, showing first and foremost a creative track record and creative potential. In research, motivation is one of the key components in creativity (Amabile, 1996; 1999) and must therefore be an important issue when hiring researchers and doctoral students. Moreover, it is advantageous if researchers have somewhat different research backgrounds. It has been found that heterogeneity in research groups as well as in work teams more broadly is generally conducive to creativity (Hemlin *et al.*, 2004). The range of differences in a group is of course difficult to judge, but the staffing of people from the same department or lab (in-house recruitment) is probably not the best solution. Hiring researchers (including doctoral students) should not be left to

ad hoc decisions but follow a sound hiring policy based on creativity criteria and social considerations (a 3rd order management issue of the model by Ernø-Kjølhede *et al.*, 2001).

Skills and Motivation

Second, all employees, including researchers should receive training in generic skills and support for motivation. Training in generic skills could be part of the doctoral student stage and the early stages for researchers entering a new research environment and a new workplace. Furthermore, skills are best acquired in training and less easily through formal teaching. Even so, a great deal of a research culture consists of tacit knowledge, which is also acquired by training. In this task, supervisors and other research colleagues fulfil an important role as guides and models for creativity to doctoral students and junior researchers. Motivation should also be promoted and managed with care and skillfulness in research on the three levels of the research management model. Rewards and incentives are important instruments for the management of motivation also in research (primarily 2nd order management). Motivation should not be ignored as if it was an innate and undestroyable part of the researcher's nature, but nurtured. Of course, some individuals are more motivated and persistent in research, but it should not be forgotten that the motivation to create can also disappear easily if not handled wisely in (2nd order) management.

Research

Third, it is important that management primarily promotes the following work activities. 1) Freedom and time to develop ideas, which should include a certain amount of risk taking (Hemlin *et al.*, 2004). 2) Broad communication and collaboration with colleagues as well as with other relevant people outside academia, e.g. in business and public organizations (the latter behaviour is of growing importance with changing academic quality criteria; see Hemlin and Rasmussen, 2006). 3) Creative decision-making, which is often suppressed by the limited number of decision alternatives produced and by the restrictions in selection among decision options (Allwood and Selart, 2001). 4) Time sharing and the priority of research tasks to other demanding tasks imposed on researchers, and the establishment of efficient routines for a slim research administration in order to keep it at a minimum. It is sometimes forgotten that the neglect of planning and administering of research can reduce research into a non-creative backbreaking business. 5) A self-reflecting attitude by the researcher (and research groups) towards her/his (their) doings by means of self-evaluation is important. Self-evaluation should be carried out regularly as a learning activity to improve research skills in creative directions. Many of these activities are part of 1st order management, but they clearly need a supporting frame on higher organizational levels.

Work Design

Fourth, it is important to change and adapt work designs to create autono-

mous, challenging and novel problems and tasks for researchers and to support "free time", as mentioned previously. Simple routine tasks and administrative tasks could often be executed by other than researchers, which implies that leaders must not only listen to the needs of researchers regarding this point, but also communicate this possibility by reallocating resources. It is possible to modularize research tasks into components out of which some can be carried out by people other than scholars. This goes against the current tendency in many universities (often due to a shrinking research budget) to have researchers do almost all the work tasks, i.e. running the labs instead of hiring skilled lab staff, transcribing audio tapes etc. Work designs are both 1st and 3rd order management issues.

Psychology

Fifth, individuals can also be encouraged and trained to support the psychological and social processes that stimulate proactivity and creativity. Namely, psychological safety (allowing creative tension to occur), open communication and transparent decision-making (facilitated by the former), coping with challenges, risks, hard work, effective research teamworking and research leadership skills (Hemlin *et al.*, 2004). Such training is vital and a task for research management to organize and secure according to the needs of the research groups and the demand of the research carried out. As research nowadays is organized in terms of collective research projects and "centres of excellence", it appears even more important to improve the psychological and social processes in research in order to release creativity. It is suggested in this paper, that research departments carry out such training with the help of professionals, psychologists, for example, to enhance conditions for creativity in research. This is more or less a 3rd order management task.

Organization

Finally, an organizational design in '3rd order research management' should support research tasks and research environments as well as researcher selection and training. In contrast to many current research departments where university top-level managers decide about organizational frames, a bottom-up process should be used. Researchers should have the opportunity to self-organize on a larger scale as opposed to research group levels, which could involve a number of different organizational designs depending on the type of research and the needs that are articulated. In self-organizing groups, group leaders, who possess and are trained in the characteristics of creative leaders, will emerge (Mumford *et al.*, 2002). The possibility of self-organizing is currently and partly due to the massification of the higher education bureaucracy severely circumscribed in many universities of several countries.

Following these six implications, I argue that research management could support and better stimulate creativity by enhancing researchers' self-management and simultaneously improve the collective shaping of better frames for research.

Notes

1 This is a typical answer given by experienced senior scientists in leading university positions when interviewed about how research performance is best achieved (Hemlin, 2000) and also found in a survey of researchers' conceptions of research quality (Hemlin, 1993).

2 Here I deliberately exclude the social activities every researcher knows about but does not officially talk about. These activities concern such things as talking to the right people and in the right way. This phenomenon, needless to say perhaps, is part of research and research management for good and bad.

3 This deficiency is nowadays recognized and universities organize supervisor and head of department courses.

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