

The innovation climate in European research and development departments regarding gender aspects. Results of a European online-survey.

Author: Iris Tinsel

Affiliation: ESGI European Studies on Gender Aspects of Inventions. Statistical Survey and Analysis of Gender Impact on Inventions. Hochschule Furtwangen University

Key Words: innovation, gender and technology, female inventors, working conditions, patents.

1. Innovation and Gender

Innovations are important for industry, research institutions and universities as well as for national economies and have an inherent ideal value. Therefore the European Union pursues the aim to become the most dynamic and competitive knowledge-based Economy until 2010. To achieve this aim and to solve the problem of scarcity of high qualified employees in technology and science it is strived – amongst other political measures in favour of innovation processes – to utilise the existing potential of high qualified women and to continue to encourage it. But therefore it is necessary to know under which conditions and in which innovation climate female and male scientists and engineers are developing inventions in their departments. Until now there is a lack of knowledge. The ESGI project will contribute to fill this knowledge gap with – amongst others – a Europe-wide online-survey of heads of research and development departments of organisations, which applied for European patents in the year 2002 to 2004.

2. Patent applications in “gendered organisations”

One possibility to evaluate innovative activity is to measure the frequency of patent applications. Especially European patents can be considered as an output-factor of investment-intensive research and development departments. The number of patent applications depends particularly on the economic (and political) importance of patents in the appropriate organisation and its idea- or intellectual property-management. For a long time economics were the disciplines, which had the main interest in scientific research of innovation and patent matters. Nowadays it also attracts attention from social science – especially organisational sociology and gender studies.

The “gendered organization” (Acker 1992) and gender specific connotation of technology and science (Paulitz 2006, Sagebiel 2007) was confirmed by various studies, which pointed out that working conditions of female scientists and engineers are not conducive for their research activities and their career (Burkhardt 2006; Ding et al 2006; Matthies 2006). Thereby different reasons for a low number of female scientists or engineers, from open exclusion to subtly discrimination, are detected.

The patent analysis by gender of the ESGI-project (Kugele 2007) as well as pilot studies before (Burkhardt & Greif 2001; Naldi & Parenti 2002) confirm, that the number of female inventors is extremely low in patent application. The question now is, why in research and development departments in which high innovation and patent activities are economically necessary the existing potential of women is obviously not utilised. The percentage of female scientists and engineers is definitely higher than the percentage of female inventors – in comparison with the percentage of male scientists and engineers (Kugele 2007).

Even though innovation processes are intrinsically tied to risks organisations strive to leave innovation processes increasingly less to chance. A more or less elaborated intellectual property management is common in the most organisations, which have a high patent activity. And the perspectives of “learning organisation” (Senge 2005) and “organizational change” (Macdonald 1995) recognise in their approach of “generation of knowledge” (Behrmann 2007) the importance of the every social actor with his/her specific personal experiences, which influence the innovation processes (Blättel-Mink 2006; Allmendinger & Hinze 2002). These personal experiences are not only individual, if not gendered as well. But until now measures of diversity management seem to be rather unusual in personnel management of research and development departments – even it is known, that diversity can entail strategic advantages in invention and innovation processes: on the one hand product development can be more effective and targeted and on the other hand diversity personnel can offer a broader spread in important creative processes (Bührer & Schraudner 2006).

3. The online-survey “Innovation and Gender”

The main question of the study is, which innovation climate in special consideration of gender aspects exists in European organisations, which applied for patents. To get an answer to this problem the questionnaire focused on personal data of the interviewee, structural data, the status of female scientists and engineers as well as questions related to the innovation management and personnel politics of the organisation. The gender category was included in most categories.

Between the end of September 2007 and the beginning of January 2008 nearly 3000 heads of R&D departments from organisations, which applied for European patents were asked to take part in the ESGI online-survey “Innovation and Gender”. A total of 600 questionnaires were completed after three months.

The results of the online-survey, which will be presented on the conference, show that the target group was reached and reflect approximately the patent activities by country and sector. The majority of the heads of R&D departments are men, while female scientists or engineers present a minority. This shows that female role models

who hold leading positions in science and technology are often lacking. In 50% of the departments neither female project leaders nor female group leaders exist and in 37% of the departments no female engineer or scientist is employed. A high significance of networking in the target organisations of the online-survey was pointed out: 75% of the interviewees declared that networking is at least partly supported by the organisation. Approximately 40% said that scientists and engineers meet each other in their free time – possible barriers for female researcher to enter important networks.

Moreover gender specific aspects of the working conditions and personnel politics as well as measures to boost innovation will be presented at the conference for the first time. The results will be of particular interest to political decision-makers, gender specialists and female inventors regarding the advancement of equal opportunities and the furtherance of innovation processes. Furthermore the results could deliver ideas for organisational change and augmentation of innovations to organisations.

4. Discussion

To what extent does gender impact on the patent activity of women? The merger of the results of the online-survey and the results of the other brand of research of the ESGI-project – a gender analysis of patent applications to the European Patent office – will give an answer to this question.

Literature

- Acker, Joan (1992): Gendering Organizational Theory. In: Mills, Albert J. and Tancred, Peta (Ed): Gendering Organisational Analysis. Newbury Park, London, New Delhi; S.248-260.
- Allmendinger, Jutta; Hinz, Thomas (2002): Perspektiven der Organisationssoziologie. In: Dies.: Organisationssoziologie. Kölner Zeitschrift für Soziologie und Sozialpsychologie. Sonderhefte, Westdeutscher Verlag, S. 9-28.
- Behrmann, Niels (2007): Patente als Quelle von Innovationen. In Koch, Gertraud und Warneken, Jürgen (Hrsg.): Region – Kultur – Innovation. Wege in die Wissensgesellschaft. Wiesbaden; S. 185-200.
- Blättel-Mink, Birgit (2006): Kompendium der Innovationsforschung. Wiesbaden
- Bühner, Susanne and Schraudner, Martina (Ed.) (2006): Gender-Aspekte in der Forschung. Wie können Gender-Aspekte in Forschungsvorhaben erkannt und bewertet werden? Karlsruhe: Fraunhofer IRB.
- Burkhardt, Dietrich and Greif, Siegfried (2001): Frauen im Patentgeschehen in der Bundesrepublik Deutschland. Ergebnisbericht: BMBF.
- Burghardt, Dietrich (2006): Berufliche und gesellschaftliche Rahmenbedingungen von Erfinderinnen. In: Revermann, Christa (Ed.): Forschende Frauen. Statistiken und Analysen. Wissenschaftsstatistik im Stifterverband für die Deutsche Wissenschaft, Essen, S.43-49.
- Ding, Waverly W./ Murray, Fiona/ Stuart, Toby E. (2006): Gender differences in Patenting in the Academic Life Science. In: American Assoc. for Advancement of Science (Ed.): Science, Vol. 313, Washington DC, S.665-667.
- Kugele Kordula (2007): Patents invented by women and their participation in research and development: A European comparative approach. Paper submitted for the PROMETEA Conference "Women in Engineering and Technology Research" 25-26. October 2007 Paris (in print).
- Matthies, Hildegard (2006): „Wenn ich in diese Domäne einbrechen will, muss ich mich so verhalten wie Männer“. In: Revermann, Christa (Ed.): Forschende Frauen. Statistiken und Analysen. Wissenschaftsstatistik im Stifterverband für die Deutsche Wissenschaft, Essen, 51-63.
- Naldi, Fulvio and Parenti, Ilaria Vannini (2002): Scientific and Technological Performance by Gender. A feasibility study on Patents and Biometric Indicators. European Commission. Luxembourg.
- Paulitz, Tanja (2006): Engendering in Engineering – technisches Konstruieren und Geschlecht. In: Zentrum für interdisziplinäre Frauen- und Geschlechterforschung an der Carl von Ossietzky Universität Oldenburg / TuNif Nordwest – Technik und Naturwissenschaften in Frauenhand e.V. (Hrsg.). Dokumentation 31. Kongress Frauen in Naturwissenschaft und Technik 5.-8. Mai 2005 in Bremen. Gezeitenwechsel. S.83 – 89
- Sagebiel, Felizitas (2007): Gendered Organisational Engineering Cultures in Europe. In: Welpel et al (eds): Gender and engineering: Strategies and Possibilities. Frankfurt a.M., Berlin, Bern, Bruxelles, New York, Oxford, Wien.149-174.
- Senge, Peter M. (1997): Die fünfte Disziplin. Kunst und Praxis der lernenden Organisation. Stuttgart.