RESEARCH IN LOGISTICS & PRODUCTION

INNOVATION CENTERS IN GREATER POLAND AND THE ASSESSMENT OF THEIR IMPORTANCE

Agnieszka Grzelczak* and Katarzyna Ragin-Skorecka*

* Faculty of Engineering Management, Poznan Univesity of Technology, Poznań, 60-965, Poland,
Email: agnieszka.grzelczak@put.poznan.pl
Email: katarzyna.ragin-skorecka@put.poznan.pl

Abstract In modern economy knowledge and innovations are key factors for competetive position of an enterprise. We observe a growing need of building and supporting relationsbetween science and business and of creating initiatives for supporting the transition of ideas and exchange of information and knowledge. Actions concerning this area also enclose the formation and development of specialized institutions for business support. Observations show the increasing importance of innovation and entrepreneurship centers. The paper presents results of the questionnaire survey of innoation ceters in Greater Poland, which was aimed at presenting the state the recognizability of these institutions, the type of activity, with which they are associated, the quality of information presented by these institutions and the knowledge, to which they give access.

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1. INTRODUCTION

In modern economy knowledge and innovations are key factors for competetive position of an enterprise. The economic policy focuses on making basis for support systems of development. The support of entrepreneurship and innovation processes accets an assumption of an offer of specific services and the formation of an economic and social environment favorable for the entrepreneur and supporting initiatives of independent economic activity (Matusiak, 2010, p. 109). activities concerning this area enclose also the creation and development of specialized institutions for business support. Activities of these innovation and entrepreneurship centers can be aimed at (Ragin-Skorecka & Grzelczak, 2011, p. 140):

- Reduction of costs of the initiated business activity,
- Transfer of technology and help in realization of innovation ventures,
- Motivation and improvement of entrepreneurs' business competences,
- Direct aid and coordination of support programs.

A questionnaire survey of innovation centers in Greater Poland was conducted in years 2011 and 2013; it was aimed at presenting the state of recognizability of these organizations, the type of activity, with which particular institutions are being associated, the quality of information resented by these organizations and the transferred knowledge. The research was also directed on the future; therefore one has examined the need for the functioning of innvation centers and the type of change of importance of these institutions that will take place in the perspective of 2030.

2. INNOVATION AND ENTREPRENEURSHIP CENTERS

In Poland entities acting in the area of the entrepreneurship, innovation and competitiveness support, are usually called "innovation and entrepreneurship centers". Actually there is no ambiguous and homogeneous definition for the institution of this type. The Polish dictionary of notions "Innovations and technology transfer" (Matusiak, 2011) attempts to form such definition; however, depending on the considered aspect of their activity, the definition can differ a little. Therefore, one can distinguish (Matusiak, 2006):

- entrepreneurship centers directed at a wide promotion and incubation of entrepreneurship (often in discriminated groups), providing support services to small companies and activisation of the development in periferical regions or in regions suffering from structural crisis,
- entrepreneurship centers directed at a wide promotion and incubation of innovative entrepreneurship, transfer of technologies and providing innovative services, as well as activation of academic entrepreneurship and cooperation between science and business,

- financial institutions aimed at facilitating the access to financing of activity of new and small business without credit history, giving access to financial services adjusted to the specific character of innovative business activity.

It is possible to assign to each of these groups, determined from the point of view of the way and range of their activity, types of support institutions, characterized with specific mission, objectives and structure (Table 1). in view to the specificity and social background of their genesis, they consitute an important element filling the gap between market mechanisms and operations of the public administration. On the market they have a function of service supplyers and they form a specific institutional infrastructure network that enables entrepreneurs to make development processes more dynamic and to realize established strategies (Mażewska & Bąkowski, 2012, p. 12).

Table 1 Classification of innovation and entrepreneurship centers (Mażewska & Bąkowski, 2012, p.12)

Innovation and entrepreneurship centers		
Entrepreneurship centers	**Financial institutions**	**Innovation centers**
Training-advisory centres	Regiona and local loan funds	Technology Transfer Centers
Centres of the entrepreneurship	Local Guarantee Funds	Academic Entrepreneurship Incubators
Business centers	Seed Capital Funds	Technological Incubators
Clubs of the entrepreneurship	Business Angel Networks	E-incubators
Consultation points		Science, research, industrial parks, technopols
Consultation and advisory points		
Preincubators		
Entrepreneurship incubators		

In the course of last dozen of years, these institutions came a long way from entities based on enthusiasm and voluntary activity of their fundators, to professional support institutions. The infrastructure of entrepreneurship support in Poland is constantly developing and is being groupped. New forms of activity and methods of functioning appear. However, in view to the flexibility of units functioning within it, the infrastructure is the most suitable partner for entrepreneurs (Mażewska & Bąkowski, 2012, p. 12).

According to the Report from 2012 "Innovation and Entrepreneurship Centers in Poland", from the beginning of the system transition in 1990, the number of innovation and entrepreneurship centers grew systematically to reach in 2012 the number of 812 organizations. They enclose following groups that one should distinguish:

- 40 science parks and 14 park initiatives,
- 29 technology incubators,
- 73 preincubators and academic entrepreneurship incubators,
- 58 entrepreneurship incubators,
- 69 technology transfer centers,
- 68 seed capital funds,
- 10 business angel networks,
- 86 local and regional loan funds,
- 55 local guarantee funds,
- 319 training - advisory and information centers.

Greater Poland is the third region in Poland in terms of the saturation with innovation and entrepreneurship centers (there is 71 of them). Authors will not describe these institutions here because a detailed characteristic of examined institutions can be found in their earlier publications.

3. RESULTS OF THE RESEARCH OF INNOVATION CENTERS IN GREATER POLAND

Presented results of the research concern the opinion of respondents on the range of perception and use of services offered by innovation centers and on prospects of their development. The research was conduced in 2011 and in 2013. The analysis enclosed results obtained from 1213 inhabitants of Greater Poland that responded in the survey. The division of respondent into selected fractions and their percentage share is as follows:

- women consituted 61% of examined people, men were 39%,
- position: students – 58%, workers – 35%, managers – 7%,
- domicil (in view of the number of inhabitants): to 10 thousands of inhabitants – 29%, 11-50 thousands of inhabitants – 26%, 51-150 thousands of inhabitants – 12%, 151-300 thousands of inhabitants – 3%, 301-500 thousands of inhabitants – 2% and more than 500 thousands of inhabitants – 28%.

Demographics also takes under consideration the work experience and education. In view of further analyses presented for chosen questions, authors selected only divisionss into fraction in view of the sex, employement and size of the town of settling. The first question concerned the acquaintance on the activity of innovation centers. Respondents could choose between four possibilities of assessing the activity (very good, good, sufficient, insuficcient) and the response "I never heard of it". Results obtained for the entire population are presented in the Figure 1.

Respondents know best the activity of organization in sectors (26.1% of assessments: very good and good) and entrepreneurship incubators (25.6% of assessments: very good and good). This might result from the fact that both employees and students, often use services and knowledge of these organizations.

The acquaintance of the activity of technology transfer centers was in majority assessed as insuficient (41.7%) or obtained the opinion "I never heard of it" (30.7%).

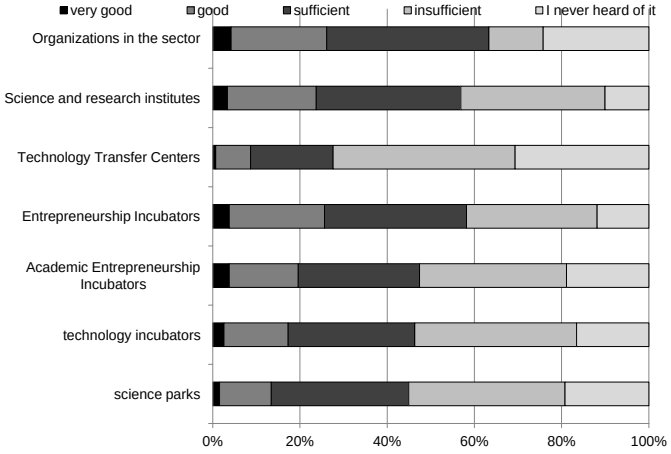

Fig. 1 Acquaintance of activity of innovation centers. Source: personal elaboration on basis of results (N=1213)

Table 2 The average and standard deviation for the assessment of the acquaintance of innovation centers, personal elaboration on basis of results (N=1213)

Types of innovation centers	Average assessment	Standard deviation
Science parks	2,74	1,80
Technology incubators	2,79	1,90
Academic entrepreneurship incubators	2,87	1,90
Entrepreneurship incubators	2,99	1,57
Technology Transfer Centers	2,53	2,27
Science and Research Institutes	2,93	1,47
Organizations in the sector	3,24	1,50

In the calculation of basis statistics for the assessment of the activity of instiotutions it has been assumed that responces "very good" have the value 5, "good" – 4, "suficient" – 3, "insuficient" – 2. Responces "I never heard of it" were omitted. Next,authors counted an average assessment and standard deviation for every institution. Results are as presented in the Table 2.

Respondents knew best organizations from the sector (average assessment 3.24) and entrepreneurship incubators (average assessment 2.99); however, this knowledge obtained results close to the grade "sufficient". The less regognition obtained Technology Transfer Centers (average assessment 2.53). The smallest spread concerned science and research institutes, the biggest – technology transfer centers.

The Figure 2 presents the average assessment of acquaintance of innovation centers in 2011 and in 2013. One can notice that the assessment of acquantance of organizations from the sector diminished most (0.5 of grade of difference). In addition, knowledge on following centers was assessed as smaller: science parks, technological and entrepreneurship incubators. In a certain extent, the acquaintance of the activity of science and research institutes, Technology Transfer Centers and academic entrepreneurship incubators, grew.

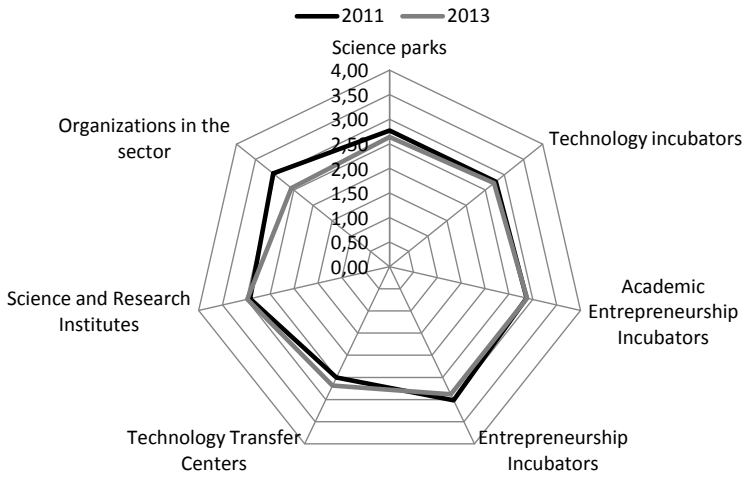

Fig. 2 Acquaintance of the activity of innovation centers in 2011 and in 2013, personal elaboration on basis of results (N=1213)

The analysis of the knowledge on innovation centers presented by respondets divided in view on their employement statut (Fig. 3) shows that these institutions are best recognized by managers. It is a positive phenomenon because the research of support for innovative ideas and ways of gaining knowledge from outside the organization depends on managers. They know best about entrepreneurshi incubators (average assessment was 3.25). workers and students know better the activity of organizations from determned sectors (average assessment 3.10 and 2.93).

The analysis of the domicil (Fig. 4) shows that the recognition of innovation centers is the worse in the group of inhabitants of the city of Poznań (more than 500 thousands of inhabitants). No institution obtained the highest average assessment of recognizability here. This result is very important for these insti-tutions because it

means that their recognizability in the center of the voidevodship is very poor. Recognizability of innovation centers in towns with not more than 10 thous. inhabitants was also very weak. However, this result was not surprising. It occurred that these institutions are best known by inhabitants of towns with 51-15 thous. inhabitants.

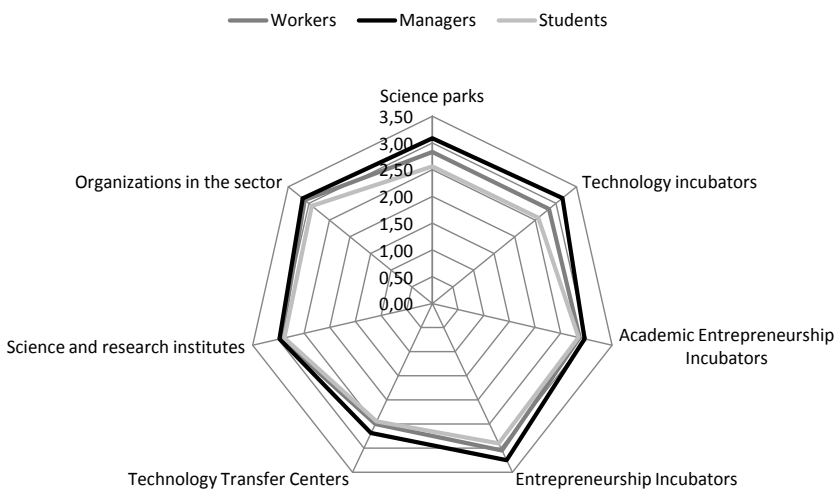

Fig. 3 Acquaintance of the activity of innovation centers in the group of managers, workers and students, personal elaboration on basis of results (N=1213)

The second question concerned the type of activity that is associated with the chosen innovation center. Respondents could choos between five possibilities (multiple choice) and the answer "I don't know". According to authors' opinion, results occurred to be rather random and therefore they were not analyzed in a larger extent. Results obtaioned for the entire population are presented in the Figure 5.

Respondents showed most often that science parks, science and research institutes and Technology Transfer Centers do scientific and research work (suitably: 70%, 60% and 40% of indications). The activity of entrepreneurship incubators and technology incubators concerns mostly consulting (suitably c. 50% and 40% of indications).

According to respondents, organizations from sectors offer the most diversified activity. About 20% of indications for each type of activity confirmed this opinion.

The third question constituted a development of the former question on the scientific and research institute. Authors assumed that knowledge and innovations used in business activity occur in such institutions. Respondents could choose between five possibilites for determining the type of services provided by organi-zation

enlisted by their own names (multiple choice) and the answer "I don't know". The Figure 6 presents results obtained for the entire population.

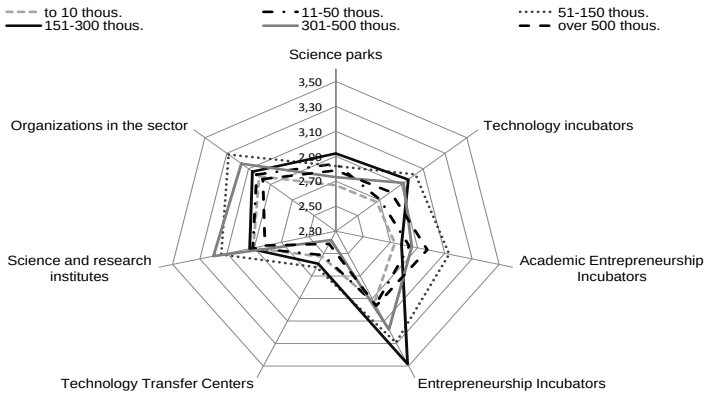

Fig. 4 Acquaintance of the activity of innovation centers in accordance to the domicil, personal elaboration on basis of results (N=1213)

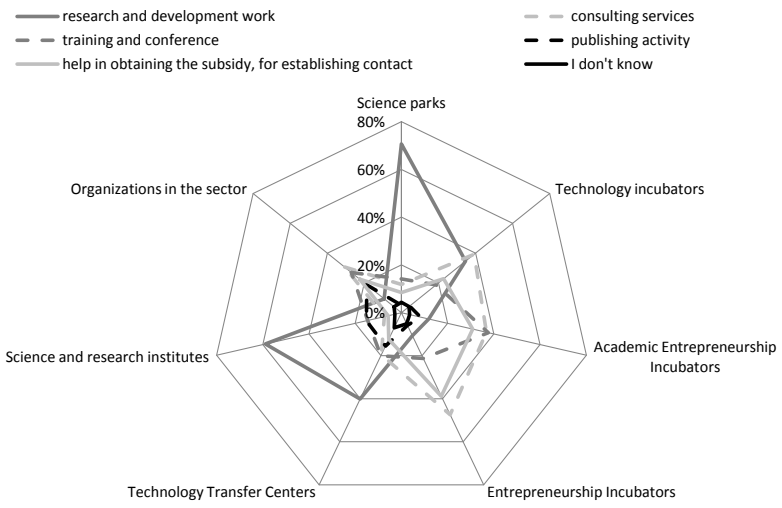

Fig. 5 Type of activity of innovation centers for the entore population, personal elaboration on basis of results (N=1213)

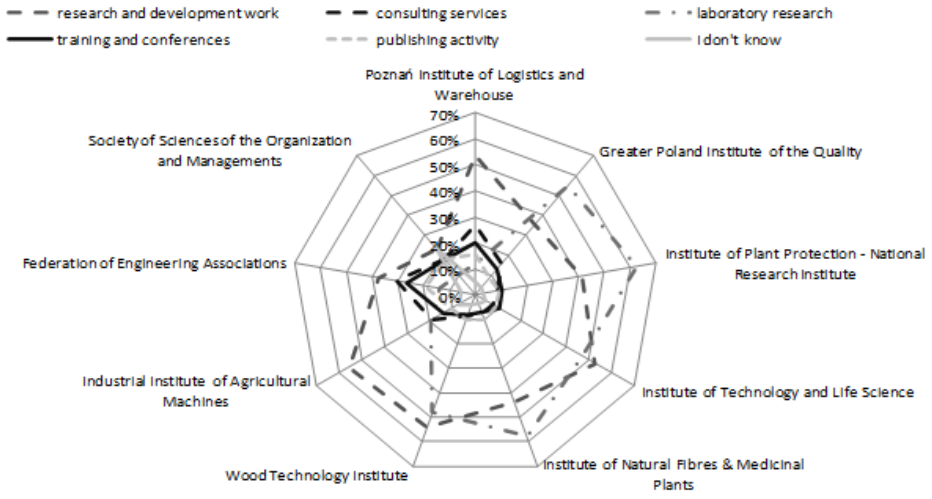

Fig. 6 Type of activity of scientific research institutes for the entire population, personal elaboration on basis of results (N=1213)

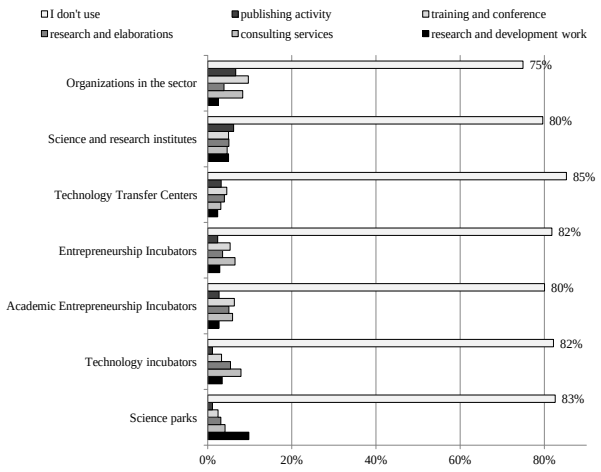

Fig. 7 Use of services offered by innovation centers, personal elaboration on basis of results (N=1213)

Listed scientific research institutes most often in the opinion of respondents conduct activity connected with laboratory tests and the research and development work. The Institute of Logistics and Warehouse and the Federation of Engineering Associations are also perceived through the prism of provided consulting services and organization of conferences and trainings. The Society of Sciences of the Organization and Managements was the least recognized from the point of view of the conduced activity (over 20% of indications "I don't know").

The next question in the research concerned using services offered by innovation centers. Respondents could choose from five possibilities (multiple choice) and give the answer "I don't use". Results for the entire population occurred as presented in the Figure 7. The analysis of obtained results shows that nearly 80% of respondents did not use services offered by innovation centers at all. It is difficult to deduce the reason of this situation. One might assume that examined innovation centers do not focus on promotion and many people do not know about their existance and about the variety of offered services both for working and studying people.

Table 3 Weighted average for the need of activity of innovation centres, personal elaboration on basis of results (N=1213)

Types of innovation centers	2011	2013
Types of innovation centers	58,2%	73,3%
Science parks	60,7%	73,2%
Technology incubators	64,2%	74,8%
Academic entrepreneurship incubators	63,7%	75,1%
Entrepreneurship incubators	60,3%	72,1%
Technology Transfer Centers	64,9%	76,1%
Science and Research Institutes	62,1%	75,3%

Two final questions concerned the direction of development of institutions in the business environment in the perspective of the year 2030. Respondents marked answers in reference to each group of these institutions presented on the scale. The evaluation of respondents concering the need of functioning of institutions in the business environement is presented in the figure 8. Respondents indicated the need of functioning of these institutions on the level of 60-80%.

The Table 3 illustrates the weighted average of indicators of needs of the functioning of innovation centers in years 2011 and 2013. One can notice that respondents declare a growing need of activity of these institutions and of using services they offer (Fig. 9).

Respondents assessed the prospect of the development of the business environment institution through the change of their role in the range of propagation of knowledge. Responses were locate in the scale „-100%" – the role will be significantly smaller",

to „+100%" – the role will be significantly bigger". Most often, respondents pointed at the response that the role of innovation centers in the popularization of knowledge will increase in the range 0-50% (Fig. 10).

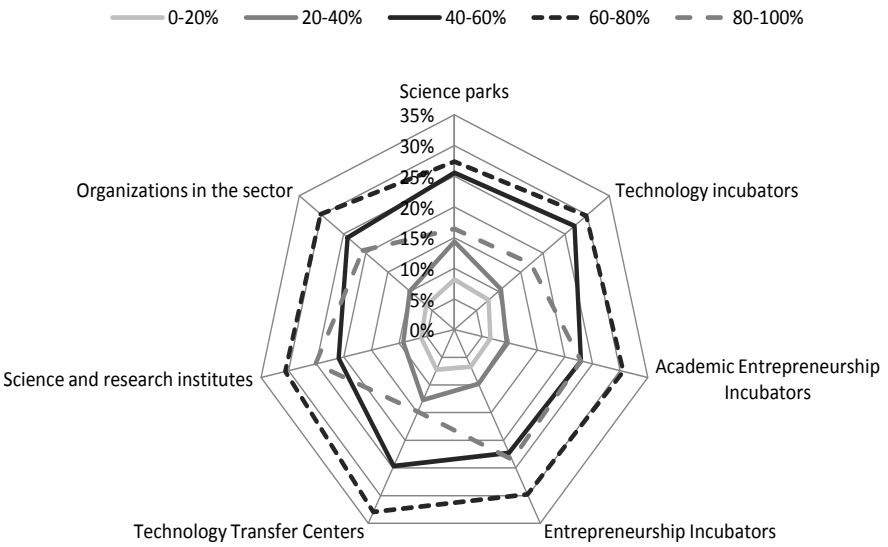

Fig. 8 Evaluation of the need of functioning of innovation centers in the perspective of the year 2030, personal elaboration on basis of results (N=1213)

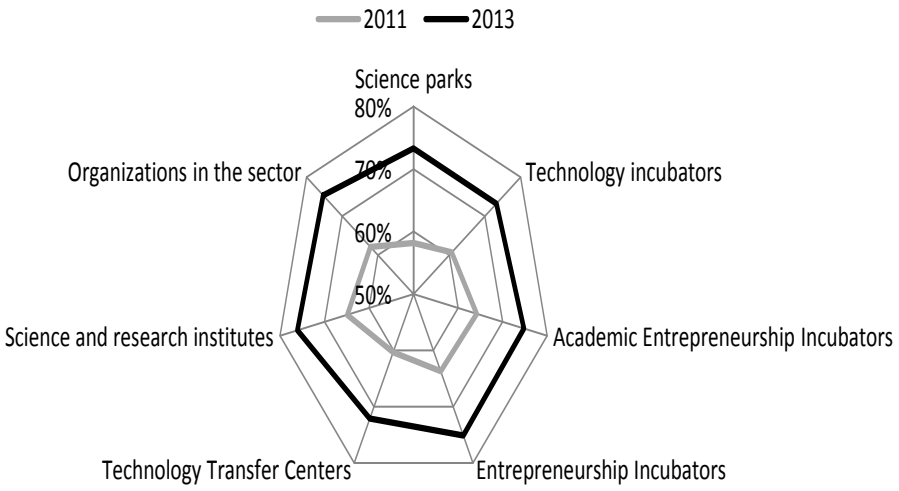

Fig. 9 Weighted average for the need of activity of innovation centres in 2011 and 2013, personal elaboration on basis of results (N=1213)

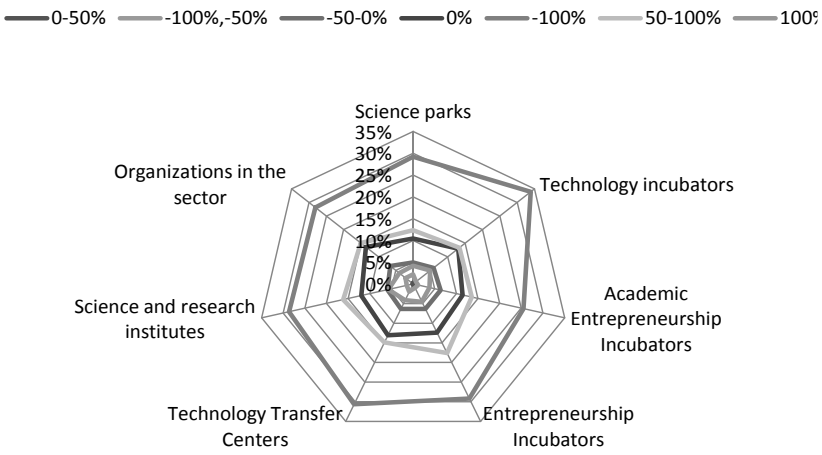

Fig. 10 Change in meaning of innovation centres in prospect 2030, personal elaboration on basis of results (N=1213)

The Table 4 presents the weighted average of indicated role of innovation centers in the transfer of knowledge in years 2011 and 2013. It is worth noticing that according to respondents opinions, the role of scientific parks, technology incubators, entrepreneurship incubators and organizations in the sector (Fig. 11). The same role for other organizations will probably be smaller.

Table 4 Weighted average for the change in meaning of innovation centres, personal elaboration on basis of results (N=1213)

Types of innovation centers	2011	2013
Science parks	29,3%	33,5%
Technology incubators	33,1%	40,5%
Academic entrepreneurship incubators	33,7%	2,5%
Entrepreneurship incubators	34,8%	43,8%
Technology Transfer Centers	32,2%	31,3%
Science and Research Institutes	35,0%	31,8%
Organizations in the sector	30,8%	31,8%

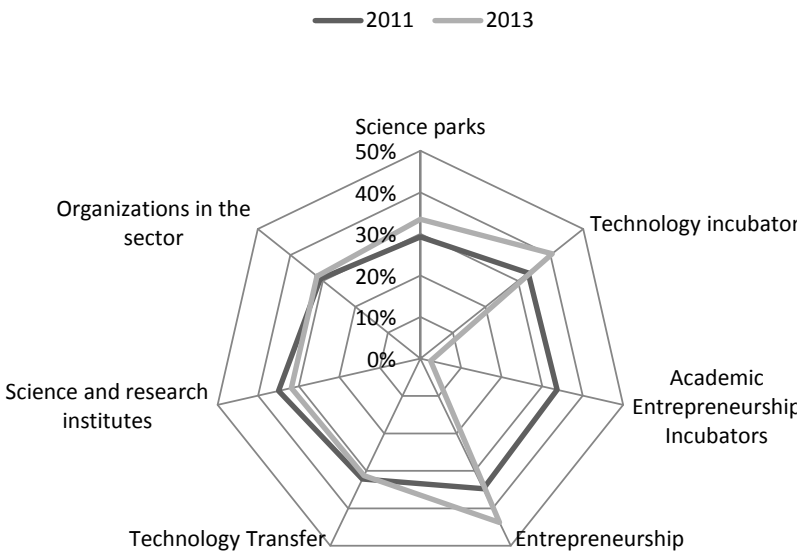

Fig. 11 Weighted average for the assessment of the need of functioning of innovation centers in years 2011 and 2013, personal elaboration on basis of results (N=1213)

5. CONCLUSION

Every presented innovation center has its own specific character and it realizes determined and specific functions within frames of the support system. Unfortunatelly, the realized research showed that the potential and know-how of innovation and entrepreneurship centers, i.e. institutions supporting the process of knowledge transfer, is largely being not used. Although it should be noticed that in reference to the year 2011, the year 2013 presented a small improvement. Realized analyses showed that:

- The average aquaintance of innovation centers presented by respondents is less than sufficient, and they recognize best organization from the sector.
- The lowest recognibility of innovation centers was defined in the group of students; this leads tyo a conclusion that lectures should enclose content of information on such institutions.
- Innovation centers are mostly associated with research and scientific work and with laboratory study.
- The majority of respondents do not use services offered by innovation centers, which mostly concern activity connected with organization of trainings and conferences and with consulting services.

- Respondents pointed at the biggest need of acting for science and research institutes, academic entrepreneurship incubators, entrepreneurship incubators and organizations functioning in particular sectors, as a major requirement in the perspective of the year 2030.
- Respondents assumed that science parks ans technology transfer centers are the least necessary in the perspective of the year 2030.
- Respondents poonted at the fact that the role of all innovation centers in the whole of economic activity will grow for about 0-50% to the year 2030.

Realized research lead to two main conclusions. First, there exist a strong need of organizing information campaines concerning innovation centers in order to give knowledge on the activity of these organizations to inhabitants of Greater Poland and to giove them an incentive to use services of these organizations. Second, research results show that the lowest knowledge of innovation centers refers to the group of students. Therefore, one should introduce content on the activity of these organization into programs of lectures and invite representatives of individual institutions in order to present their activity and possibilities of initiating cooperation with them.

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BIOGRAPHICAL NOTES

Agnieszka Grzelczak work as assistant professor at Faculty of Management Engineering at Poznan University of Technology. Already during her studies she was concerned with issue of human resource management. She participate in summer school at Wirtschaftsuniversität in Vienna, and then she studied Personalmanagement at BTU in Cottbus. Her doctoral thesis was concern on implementation of team work in companies. She is licensed lecturer of greman REFA Verband für Arbeitsgestalung, Betriebsorganisation und Unternehmansantwicklung. She maintains close relations with economy . Her scientific research are focused around the topic of employee development and team work.

Katarzyna Ragin-Skorecka works as a lecturer in the Department of Management and Information Systems of Poznan University of Technology. The research work deals with organization identity, using the methods of processes mapping to search innovation for product, process and organization, and practical aspects of knowledge transfer between science and business.