

Shaping the Brand Awareness of Science and Technology Parks in Eastern Poland

Anna Maria Lis

Gdańsk University of Technology, Poland

Ewa Romanowska

University of Białystok, Poland

Abstract

The main aim of the paper is the analysis of the effects of actions undertaken so far that have aimed at shaping brand awareness of the parks in Eastern Poland supported under the Operational Programme Development of Eastern Poland. The authors focused on the demand-side perspective and scrutinized two vectors of conscious branding: the surrounding environment and communication with customers. The group of potential customers underwent qualitative research (ITI interviews). The research in the group of the actual customers was conducted by means of quantitative methods (CAPI and CATI interviews). The results of the study indicate the lack of knowledge of the parks' functioning, the lack of awareness of the benefits that could be achieved while cooperating with parks, low effectiveness of the existing forms of promotion of the parks, but also the high needs for innovation support among entrepreneurs. On the basis of the study results, the authors formulated recommendations for improving the promotion of parks.

Keywords: science and technology parks, brand

Introduction

Science and technology parks are now a global phenomenon. The history of their creation dates back to the 1950s when Stanford Industrial Park was spontaneously created and then transformed into Stanford Science Park (Matusiak 2011, 18). The successes of the Californian project as well as another American innovation center—Research Triangle Park—challenged the national and regional authorities of other countries to adopt the process of creation and development of institutions that combined science, technology, research and business (Abetti 2004; Brčić and Brodar 2008, 1) and to regard them as an important instrument of innovation policy (Matusiak 2011, 18). In Europe, science and technology parks began to appear in the 1980s although the majority of the world's existing entities were established in the 1990s (Järvelin and Koskela 2005, 1; Minguillo and Thelwall 2012, 332) as a result of the so-called third wave of their creation (Kelessidis, Vasalos, and Komminos 1999). According to the data from the European Commission, at the beginning of this century Europe was home to over 900 different types of science parks¹ largely supported by public funds aimed at constructing and operating the park infrastructure and developing services for the newly established enterprises (Sofouli and Vonortas 2007, 527).

In Poland, the intensive development of business environment infrastructure occurred after 1989, yet the largest increase in number of this type of institution resulted from the accession of Poland to the European Union in 2004 and the launch of numerous support programs financed from the EU budget. In 1990 Poland had 27 business and innovation institutions, while in 2012 there were already 821, including 54 technology parks and park initiatives (Bąkowski and Mażewska

1. See: European Commission Enterprise Directorate General. Benchmarking of Business Incubators, Final Report. February 2002. Centre for Strategy and Evaluation Services.

2012, 13–14). Unfortunately, the quantitative development of the park structures does not correlate with their qualitative development. It is mainly due to development barriers of a structural, systemic and competence nature, yet there are also other serious barriers concerning consciousness and culture, which result from a low level of social trust, a lack of understanding of the park concepts and low social acceptance for innovative attitudes (Lis 2013). The science and technology parks in Poland have yet to develop effective ways of promoting their activities and thus overcoming these mental barriers although the subject literature, among the key success factors of science and technology parks, presents marketing activities influencing the attractiveness of parks and emphasizes that a positive image of a park and a presentation of good examples of commercial success of its tenants are considered to be an important determinant of a successful park investment (Matusiak 2011; Zhang 2004).

The subject matter of the research paper is building brand awareness by various institutions from the business environment, including science and technology parks. Branding of institutions that support incubation of new innovation-based companies as well as stimulate the science-business cooperation is analyzed from the methodological perspective of Wally Olins and concerns two out of four main vectors of a brand with regard to parks, namely the surrounding environment of the brand and communication with customers.

The specification and the focus on the research subject results from the gap that exists in the literature on brand building and the brand impact of business support institutions. The limitations in the scholarly studies particularly refer to science and technology parks, their surrounding environment, their image among various customers and the ways the organizations address their recipients.

The main aim of the article is to present and scrutinize the research findings on the results of activities directed at branding of selected science and technology park structures in Eastern Poland with regard to two vectors of Olins's methodology (i.e., the environment and brand communication).

1 The literature review

The concept of science parks is multidimensional and highly diverse (Lis 2012). Due to the differences in approaches to implement this idea, the subject literature does not provide a single, generally accepted definition of “a science park” (Wessner 2009) which would be applicable to all the aspects of this phenomenon (Hansson 2007, 354). The definitions of parks present in the literature vary as much as the very park initiatives (Link and Link 2003, 81) and to describe them there are such numerous terms as: science park (research park), technology park, industrial park, and technopole (Machnik-Słomka and Kordel 2012, 241). Although many authors highlight the distinctiveness of particular centers (Chorda 1996; Sternberg 2004), the disproportions at the level of their development (Matusiak 2011, 124–125) as well as their dynamic nature (Phan, Siegel, and Wright 2005), it is possible to distinguish a particular set of their common characteristics (Colombo and Delmastro 2002; Hommen, Doloreux, and Larsson 2006), which include: a sophisticated cutting-edge infrastructure of the parks, formal and operational relations with R&D institutions (or higher education institutions), support for creation and development of knowledge-based enterprises, and a management model that actively strengthens the transfer of technology and business skills of the park tenants.

Science parks are perceived as a crucial component of the “science-technology-economy chain” (Brčić and Brodar 2008, 2). In political decision-makers' opinions, they are a tool for raising the level of technological sophistication and competitiveness of local economies, which in turn leads to the development of a knowledge-based economy (Cumbers and MacKinnon 2004; Minguillo and Thelwall 2012; Porter 2000). It is directly connected with two main objectives that underlie their functioning — parks should serve both as a catalyst for regional economic development as well as a generator of entrepreneurship development since their role is to facilitate the creation of new technology companies and to support the transfer of knowledge and technology among universities, R&D institutions, companies and markets (Vilà and Pagès 2008, 144). Having conducted their research



among science park managers, Luger and Goldstein (Luger and Goldstein 1991) proposed a set of key objectives divided into three groups: relatively important—economic development, average important—the development of technology, the development of academic entrepreneurship and commercialization of academic research, relatively unimportant—creation and redistribution of income.

What appears particularly essential in terms of the effectiveness of the pursued objectives is the positive image of parks, formed consciously by the individuals and institutions involved in the development of park structures—members of the boards of parks, the park supervisory institutions (e.g., local governments) as well as institutions supporting and promoting these centers (e.g., government agencies, NGOs). As pointed out by Dąbrowska (2011), science parks must maintain comprehensive skills of self-presentation so that they are able to prove (directly or indirectly) their effectiveness to their environment. The image of a successful park initiative plays a key role in attracting business tenants and research institutions interested in cooperation as well as highly skilled and educated people aspiring to work in the park tenants. A positive image of such centers, including special ambiance around the parks, builds their local sanctioning and a deeper understanding of their activities (Dąbrowska 2011, 5; Matusiak 2011, 30). Knowledge of a park offering and a positive public perception (e.g., by external innovative enterprises) results from the marketing strategies properly implemented by each center's managerial staff. The present and future success and profitability of science and technology parks largely depend on the brand they manage to create together with the tenants and external cooperators. Branding and creating brand awareness are essential for all the market operators, including business environment institutions (Matusiak 2011; Olins 2008, 25, 18). In the context of the development of science parks, managers' attention should be concentrated on the analysis of all the four vectors of conscious branding, which include:

- services offered by the centers,
- behavior and work methods of the staff,
- the surrounding environment, and
- communication with customers (Matusiak 2011).

The first of the vectors—service offering—comprises two basic types of services, namely “hard services” provided on the basis of the developed technical infrastructure of a park, and “soft services” provided by highly qualified internal staff and external experts. The parks' service offerings should perfectly match the profile of the local economy since it is the environment that is to highly determine the technological specialization of the parks. However, not to be disappointed by less successful outcomes, it requires a careful analysis of the structure of the local economy and constant monitoring of the needs and expectations of the local businesses. The other vital factors are communication with customers carried out by means of a variety of information channels as well as a series of actions aimed at disseminating information on the parks and the services they provide.

2 Methodology

In the article the authors focus on the results of the research study entitled “Support for innovation centers in Eastern Poland—evaluation of the first effects.”² The subject of the study concerned projects implemented under the Operational Programme Development of Eastern Poland (OP DEP) within Measure I.3 “Supporting innovativeness” of Priority Axis I. “Modern Economy,” in accordance with scheme 4 “Support for the development of innovation centers” (*Program Operacyjny Rozwój...* 2007). Under this scheme a total of thirteen projects have been implemented, whose objectives involved construction, expansion, modernization and inauguration of the science and technology parks and industrial parks (including the infrastructure aimed at businesses incubation) in five voivodships of Eastern Poland. The study focused on assessing the performance of the supported innovation centers³ with regard to the objectives set in the OP DEP, taking into account three different perspectives: the systemic-side, the supply-side as well as the demand-side perspective.

2. This study was conducted by WYG PSDB Ltd. on behalf of the Polish Agency for Enterprise Development. Anna M. Lis was the leading expert and the author of the final report. Ewa Romanowska took part in the implementation of the survey.

3. The terms „park” and „innovation center” are used interchangeably in the article.

In the subsequent part of the article, the authors analyze the demand-side perspective, namely the perspective of the actual and potential customers of the centers and scrutinize two of the four vectors of conscious branding: the surrounding environment and communication with customers. The research presented in this article covered three main groups of entities:

- potential clients—innovative companies that are not the clients of the parks supported under Measure I.3 of the OP DEP, but which, due to their location and innovative capacity, could become the future clientele of these centers
- internal customers—business tenants located in the parks
- external customers that use the services of the parks but who are not their tenants

The group of potential customers underwent qualitative research based on standardized and structured direct individual telephone interviews (ITI). The study involved a total of 27 randomly selected companies that met two criteria: high innovativeness and location within the area of five voivodships of Eastern Poland (warminsko-mazurskie, podlaskie, lubelskie, świętokrzyskie, and podkarpackie).

The research in the group of the actual customers was conducted by means of quantitative methods and comprised 220 internal customers and 123 external customers of the analyzed parks. The basic techniques for obtaining the data were Computer Assisted Personal Interviews CAPI (applied to the internal customers) and Computer Assisted Telephone Interviews (applied to the external customers). In the study conducted in all the three groups of enterprises (potential, internal and external customers) the respondents were mainly representatives of the top management cadre of these companies (tab. 1).

Tab. 1. Basic information about the study

Category of entities	Study sample	Choice of entities for study	Data collection technique
1st Group potential customers	27 companies	Companies selected at random that meet certain criteria (innovation and location)	ITI
2nd Group internal customers	220 tenant companies	Companies selected at random from the databases provided by surveyed institutions	CAPI
3rd Group external customers	123 companies	Companies selected at random from the databases provided by surveyed institutions	CATI

As far as the first vector of conscious branding, namely the surrounding environment, is concerned, the authors focused on the innovation companies that operate in the environment of the parks supported under Measure I.3 of the OP DEP (the 1st Group of entities—potential clients), and scrutinized the awareness of operation as well as recognition of the parks, knowledge of their offerings and the companies' interest in cooperation. The authors also took account of the reviews of the parks made by enterprises inexperienced in cooperation with parks as well as the ones that have already taken advantage of such services (apart from the parks supported within the OP DEP). The further considerations include the companies' expectations towards the support for their innovation activities in view of the parks' current offerings (tailoring the park services to companies' needs). As it might be observed, all the aspects connected with the surrounding environment may be perceived as evidence of efficiency of the park branding methods applied so far.

With regard to the second vector—i.e. communication with customers, the authors scrutinized the companies that acted as customers of the parks supported under Measure I.3 of the OP DEP (the 2nd Group and the 3rd Group of entities—internal and external customers). The research analysis concerned not only the enterprises' operations focused on market prospection before using particular park services but also the sources of information on the parks and their offerings (tab. 2). The interpretation and the summary of the findings collected during the research study was performed by means of a narrative review technique (Czakon 2013).

Tab. 2. Examples of variables and the research questions

Examples of variables	Examples of the research questions
The surrounding environment: the 1st group of entities	
The awareness of the parks in the market	<ul style="list-style-type: none"> • Have you ever heard about this form of support for innovation as parks?
Recognition of the parks	<ul style="list-style-type: none"> • Do you know specific parks located in the region or outside the region? • Please list the names of the parks located in the region or outside the region
Knowledge of the parks and their offers	<ul style="list-style-type: none"> • Do you know the offers of the parks? (If not) What is the reason that you are not familiar with the offers of the parks?
Interest in cooperation with the parks	<ul style="list-style-type: none"> • Were the attempts to establish the contacts between the park and your company made? (If yes) Who was the initiator of the contacts between the park and your company?
Opinions about the parks	<p>Questions to the companies that do not have experience in cooperation with parks:</p> <ul style="list-style-type: none"> • What is the reason that you have not cooperated with parks? <p>Questions to the companies that have experience in cooperation with parks:</p> <ul style="list-style-type: none"> • What was the reason that you decided to cooperate with a given park? • How do you rate the quality of services provided by the parks with whom you collaborated (including the range and quality of the services, substantive preparation of the people providing the services, adapting the offer to the needs of enterprises)?
Adaptation of the park services to the needs of companies	<ul style="list-style-type: none"> • What forms of innovation support would be the most needed to your company? Why these forms?
Communication with customers: the 2nd group and the 3rd group of entities	
The sources of information about the park and its offer	<ul style="list-style-type: none"> • How did you find out about the possibility of conducting your business in the park? (a multiple choice question) • How did you find out about the possibility of using the services provided by the park? (a multiple choice question)
The market prospectation before using the services of the park	<ul style="list-style-type: none"> • Were you familiar with the offer of such institutions before deciding on conducting your business in the park? (a single choice question) • Did you check whether other entities offer the service before using this type of service provided by the park? (a single choice question) • Why did you decide to use the service of the park and not one of any other entity? (a multiple choice question)

3 Results

3.1 The surrounding environment

3.1.1 The characteristics of the 1st group of entities—potential clients

The study covered companies representing different sectors of the economy, both small and medium enterprises, for which the regional and domestic market is the main activity market, as well as large companies operating in international markets. The innovative potential of the surveyed companies measured by the number and scale of novelty of the implemented innovations should be assessed as above average—the vast majority of the companies of the research sample during three years preceding the study had introduced innovations (mainly product and process innovations) of various degrees of novelty (in most cases these were innovations on the national scale).

3.1.2 The awareness of operation and recognition of the parks

The results of the study conducted in the group of potential customers (enterprises operating in the range of influence of the analyzed park structures) indicate that most of the companies are aware

of the specific innovation centers and are able to name them. They most often pointed out the technology parks, business incubators and technology transfer centers located in Eastern Poland, mainly mentioning the innovation centers supported in Measure I.3 of the OP DEP, which proves a fairly high level of awareness and recognition of the institutions operating in the market.

3.1.3 Knowledge of the service offerings of the parks

However, the entrepreneurs were much less familiar with the range of offerings of the centers — only a few respondents were able to mention the basic package of services provided by the parks co-financed under Measure I.3 of the OP DEP. The vast majority had no knowledge of this subject, proving lack of their needs to establish cooperation with the institutions. Some respondents excused their lack of knowledge of the parks' offerings, referring to the institutions' relatively short period of market operation and a weak system of their promotion (the study revealed such opinions as: “we do not know exactly what such centers deal with,” “we do not know what they are for”).

3.1.4 Interest in cooperation with parks

Moreover, the interviews with the representatives of the innovative companies show that the parks very rarely contacted them in order to present the service offerings (only three companies in the research sample admitted that the innovation centers had turned to them, presenting their services). The companies did not seek the contact with the institutions either, and if such attempts were made, they mostly concerned enquiries on the possibility of benefiting from their consulting services.

3.1.5 Opinion on the parks

Most of the analyzed companies have not undertaken any cooperation with any innovation center supported under Measure I.3 of the OP DEP, explaining that the lack of such cooperation is — as in the case of unawareness of the service offering — due to no particular needs in this respect. The entrepreneurs remain inexperienced in cooperating with such institutions and unconvinced of their benefits (stating repeatedly that “we are not sure whether the cooperation with the center will translate into development of our company”) as well as unable to indicate the areas of a potential cooperation. A few entrepreneurs are convinced that both the quality of the services provided by the innovation centers and the substantive preparation of the centers' staff are comparatively poor (according to some respondents, “the parks do not ensure a sufficient number of specialists,” and the “activity of the company is too specialized when compared with the range of services offered by the parks”). During the study there were also frequent comments on the centers' poor knowledge of the real needs of entrepreneurs and the consequent mismatch of such offerings to the needs (the respondents claimed that “the parks and the entrepreneurs operate in two different worlds,” “the parks work for themselves,” “the parks are closed for businesses,” “the parks are not familiar with the problems the companies face in the market”).

The few companies that decided to cooperate with the innovation centers have chosen, in most cases, the institutions located in the same region (including the centers supported under Measure I.3 of the OP DEP) owing to the close location and an interesting service offering of a given center. The companies experienced in cooperation with innovation centers rate the range and the quality of their services as well as the substantive preparation of the people providing the services relatively highly, (the respondents while assessing the centers' services used terms such as “satisfactory rating,” “positive rating,” “very high rating”), and are willing to continue this cooperation in the future.

3.1.6 Tailoring the park offerings to companies' needs

Most of the surveyed companies admit that they need support in the area of innovation. When asked about preferred forms of support, the entrepreneurs usually responded that “any form of support for innovation is beneficial,” yet the most desirable forms mentioned by them were: financial support, specialized consulting and training services (“tailored-made,” meeting specific needs of the companies), support in the implementation of innovation, initiation of business contacts (networking) and assistance in the research and development phase. For this reason, the entrepreneurs

would be most interested in using the soft services offered by the parks, which include training, consulting and information services. Much less popular are the hard services comprising lease of offices, production and specialist (e.g., laboratory) space and infrastructure. Paradoxically, however, at the present early stage of the development of the analyzed innovation centers (some projects are being implemented) it is the hard services that are much better developed. Although most centers also provide soft services, adapting them to the enterprises' needs requires more preparations connected with, *inter alia*, the analysis of the local market, employment of qualified personnel and training.

3.2 Communication with customers

3.2.1 The characteristics of the 2nd group and the 3rd group of entities— internal and external customers

In the group of the internal clients there were mainly start-ups—very young companies operating in the market mostly for no longer than three years, belonging to the SME sector (with a predominance of micro-enterprises), focusing mainly on the domestic market, with a medium level of innovation. The group of the external customers was more varied: the vast majority were companies and individuals engaged in business activities (representing different sectors of the economy) as well as other entities (including the local government units, NGOs, business environment institutions and scientific institutions). The surveyed entities operate both in the domestic and international markets, they are also considerably active in the area of innovation.

3.2.2 The market prospection before using parks' services

The research study reveals that the enterprises acting as internal customers of the parks hardly ever explored the service offerings of other similar centers before taking any action to operate in a particular park as well as using any service provided by the park. Only about 23% of the respondents were familiar with an opportunity for an activity in other parks, whereas a vast majority (slightly over 73%) had not carried out a similar market prospection. The best market knowledge presented by the companies concerned consulting services—almost 1/3 of such enterprises had made the market prospection before they took advantage of such park offerings. Being aware of offerings of other centers, the companies made particular choices about a service due to the location of the center (62% of the enterprises provided such answer), their trust in the quality (39% of indications) and the price of the services (30% of indications).

The external customers, before benefiting from the service of a given park, were more aware of the market offerings than the park tenants (internal customers). It particularly relates to various work requiring a center's test equipment (including research work)—over 80% of the enterprises got familiar with the offerings of other entities before using such a type of service. As far as the other offerings (such as rental of a conference and training hall, training and consulting services) are concerned, only slightly over 1/3 of the companies had earlier carried out the market prospection about the discussed issue. In the opinion of the questioned enterprises, such parks' advantage (when compared to other entities that provide similar services) lies in their cutting-edge infrastructure, affordable prices and a quick performance of services.

3.2.3 The sources of information on the parks and their offerings

The research carried out in the group of internal and external customers indicate different effectiveness of the existing forms of promotion of the parks and their service offerings. The study indicates that personal contacts are the most important source of information about the innovation centers' service offerings. This particularly applies to the park tenants (internal clients), more than half of whom found the information about the parks' offerings directly from their friends or the representatives of a given institution. In the case of the external clients, the answer "directly (personal contacts)" was chosen by approx. 33% of the respondents.

The Internet turned out to be another important source of information concerning the parks' service offerings—approx. 1/4 of the internal customers and almost 1/3 of the external customers gained the information from various websites. The vast majority of these companies relied on



the website of a given park and only a few entrepreneurs used the information from the websites of public administration institutions, the Polish Agency for Enterprise Development (PAED) and institutions providing information services to entrepreneurs. The other sources of information such as articles in the press, advertising spots on the radio and television as well as information sent via emails were very rarely indicated by the respondents—this applies to both the internal and external clients.

It is worth noticing that the study has revealed a very large group of entrepreneurs who use the “other” sources of information about the parks’ service offerings than the indicated in the answer choices. The respondents pointed predominantly friends, business partners and the representatives of the parks (although, according to the survey questionnaire, the answers should be placed in the first group—“directly (personal contacts)”), labor offices, other business support institutions, the PAED and universities. Some respondents argued that the knowledge of the parks’ offerings was already common knowledge stemming from the location in the region in which a given innovation center operates.

Conclusions

A careful analysis of the study results indicates a large contradiction in the respondents’ opinions. On the one hand, the entrepreneurs openly admit that they are not familiar with the innovation centers’ offerings, on the other hand, they complain that the offerings of the centers poorly satisfy their business needs. They themselves are inexperienced in cooperation with such parks, yet they presuppose that the quality of the provided services is below their expectations. Excusing their lack of knowledge of the innovation centers’ offerings and the lack of connections with the centers, they prove no particular need to establish such cooperation. Nevertheless, the results of the study show that the needs for innovation support among these entrepreneurs are large and, taking into account the range of services offered by the innovation centers, they could be met by the very centers.

It can be assumed that the contradictions identified and described above are mainly due to the lack of knowledge of the parks’ functioning. The entrepreneurs are not aware of the benefits that could be achieved while cooperating with the parks, thus they do not feel the need to establish relations with this type of institutions. Consequently, one of the major challenges the innovation centers must face is to create an effective promotion system since the existing forms of their business promotion have been rather ineffective and attracted an unsatisfying number of customers. On the basis of the study, it is possible to formulate some recommendations for improving the promotion of the parks applicable to different groups of customers.

At the level of the parks, it is recommended to launch new channels of information flow and to focus on “active” promotion consisting in initiating relationships with companies and familiarizing them with the offering of a given parks. As according to the study results, the most effective form of promotion of the innovation centers is whisper marketing, the centers should constantly improve the quality of the provided services, taking into account the needs of the local economy, which would translate into their popularization among entrepreneurs.

At the level of the institutions promoting and popularizing the parks in Poland (e.g., the PAED, local authorities), it is recommended to prepare a training program dedicated to the centers’ managers to research the entrepreneurs’ business needs and monitor the level of their satisfaction with the provided services. At this level, it is also worth considering a nationwide campaign, which addressed particularly to the SME sector, would promote the innovation centers, improve the recognition of the parks in the market and, above all, disseminate information about their service offerings and raise awareness of the potential benefits from the cooperation with such institutions.

It must be also emphasized that research results presented above are based on a limited number of cases. For this reason, they should be regarded as the first stage of a study on shaping the brand awareness of science and technology parks in Eastern Poland. In order to obtain more accurate data and formulate hypotheses it is necessary to conduct a study on a larger sample. The article is therefore the basis for future research with the use of quantitative methods.

References

- ABETTI, P.A. 2004. "Government-Supported Incubators in the Helsinki Region, Finland: Infrastructure, Results, and Best Practices." *The Journal of Technology Transfer* no. 29 (1):19–40.
- BAKOWSKI, A., and M. MAŻEWSKA. EDS. 2012. *Ośrodki innowacji i przedsiębiorczości w Polsce. Raport 2012, Seria Innowacje*. Warszawa: Polska Agencja Rozwoju Przedsiębiorczości.
- BRČIĆ, R., and K. BRODAR. 2008. "Role of Science and Technology Parks in Entrepreneurship Development. The Case of Varaždin County." *International Scientific Publications: Journal Economy & Business* no. 2 (1):363–375.
- CHORDA, I.M. 1996. "Towards the Maturity Stage: an Insight into the Performance of French Technopoles." *Technovation* no. 16 (3):143–152. doi: 10.1016/0166-4972(95)00042-9.
- COLOMBO, M.G., and M. DELMASTRO. 2002. "How Effective Are Technology Incubators? Evidence from Italy." *Research Policy* no. 31 (7):1103–1122. doi: 10.1016/S0048-7333(01)00178-0.
- CUMBERS, A., and D. MACKINNON. 2004. "Introduction: Clusters in Urban and Regional Development." *Urban Studies* no. 41 (5–6):959–969. doi: 10.1080/00420980410001675896.
- CZAKON, W. ED. 2013. *Podstawy metodologii badań w naukach o zarządzaniu*. 2nd ed. Warszawa: Wolters Kluwer.
- DABROWSKA, J. 2011. Measuring the Success of Science Parks: Performance Monitoring and Evaluation. Paper read at XXVIII IASP World Conference on Science and Technology Parks, 2011.06.19–22, at Copenhagen.
- HANSSON, F. 2007. "Science Parks as Knowledge Organizations—the "ba" in Action?" *European Journal of Innovation Management* no. 10 (3):348–366. doi: 10.1108/14601060710776752.
- HOMMEN, L., D. DOLOREUX, and E. LARSSON. 2006. "Emergence and Growth of Mjardevi Science Park in Linköping, Sweden." *European Planning Studies* no. 14 (10):1331–1361. doi: 10.1080/09654310600852555.
- JÄRVELIN, A.-M., and H. KOSKELA. 2005. "The Role of Science Parks in Developing Company Networks." In *Frontiers of E-Business Research, FeBR 2004, Conference Proceedings*, edited by M. Seppä, M. Hannula, A.-M. Järvelin, J. Kujala, M. Ruohonen and T. Tiainen, 507–519. Tampere, Finland.
- KELESSIDIS, V.C., I.J. VASALOS, and N. KOMNINOS. 1999. Planning for Science and Technology Parks in Southern Europe: Experiences from Spain, Italy and Greece. Paper read at XVI IASP World Conference on Science and Technology Parks, 1999.08.31–09.04, at Istanbul.
- LINK, A.N., and K.R. LINK. 2003. "On the Growth of U.S. Science Parks." *The Journal of Technology Transfer* no. 28 (1):81.
- LIS, A. 2012. "Parki naukowe i inkubatory przedsiębiorczości w teorii i praktyce gospodarczej." In *Wymiary konkurencyjności: zarządzanie innowacjami w regionie*, edited by A. Lis, 67–84. Gdańsk: Wydawnictwo Politechniki Gdańskiej.
- . 2013. "Główne bariery w systemie transferu technologii w Polsce." *Zarządzanie i Finanse* no. 11 (1):295–311.
- LUGER, M.I., and H.A. GOLDSTEIN. 1991. *Technology in the Garden. Research Parks and Regional Economic Development*. Chapel Hill: University of North Carolina Press.
- MACHNIK-SŁOMKA, J., and P. KORDEL. 2012. "Modele biznesowe parków naukowo-technologicznych a strategię sieciowe klientów parków." *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Finanse, Rynki Finansowe, Ubezpieczenia* (55):237–258.
- MATUSIAK, K.B. ED. 2011. *Strategiczne obszary rozwoju parków technologicznych, Seria Innowacje*. Warszawa: Polska Agencja Rozwoju Przedsiębiorczości.
- MINGUILLO, D., and M. THELWALL. 2012. "Mapping the Network Structure of Science Parks. An Exploratory Study of Cross-Sectoral Interactions Reflected on the Web." *Aslib Proceedings* no. 64 (4):332–357. doi: 10.1108/00012531211244716.
- OLINS, W. 2008. *The Brand Handbook*. London: Thames and Hudson Ltd.
- PHAN, P.H., D.S. SIEGEL, and M. WRIGHT. 2005. "Science Parks and Incubators: Observations, Synthesis and Future Research." *Journal of Business Venturing* no. 20 (2):165–182. doi: 10.1016/j.jbusvent.2003.12.001.
- PORTER, M.E. 2000. "Location, Competition, and Economic Development: Local Clusters in a Global Economy." *Economic Development Quarterly* no. 14 (1):15–34. doi: 10.1177/089124240001400105.
- Program Operacyjny Rozwój Polski Wschodniej 2007–2013. Narodowe Strategiczne Ramy Odniesienia 2007–2013*. 2007. Warszawa: Ministerstwo Rozwoju Regionalnego.



- SOFOLI, E., and N.S. VONORTAS. 2007. "S&T Parks and Business Incubators in Middle-Sized Countries: the Case of Greece." *Journal of Technology Transfer* no. 32 (5):525–544. doi: 10.1007/s10961-005-6031-1.
- STERNBERG, R. 2004. "Technology Centres in Germany: Economic Justification, Effectiveness and Impact on High-Tech Regions." *International Journal of Technology Management* no. 28 (3–6):444–469. doi: 10.1504/Ijtm.2004.005298.
- VILÀ, P.C., and J.L. PAGÈS. 2008. "Science and Technology Parks. Creating New Environments Favourable to Innovation." *Paradigmes: economia productiva i coneixement* (0):141–149.
- WESSNER, C.W. 2009. *Understanding Research, Science, and Technology Parks. Global Best Practices. Report of a Symposium*. Washington, DC: National Academies Press.
- ZHANG, Y. 2004. "Critical Factors for Science Park Management: the North American and European Experience." *International Journal of Entrepreneurship and Innovation Management* no. 4 (6):575–586. doi: 10.1504/IJEIM.2004.005849.