

eISSN 2353-8414
pISSN 2353-8503

MARKETING OF SCIENTIFIC AND RESEARCH ORGANIZATIONS

NO. 35 no. 1(35)/2020



EVALUATION OF ON-LINE MARKETING COMMUNICATION OF SCIENTIFIC UNITS IN THE CONTEXT OF ITS COOPERATION WITH COMPANIES FROM THE LODZ REGION

OCENA MARKETINGOWEJ KOMUNIKACJI INTERNETOWEJ JEDNOSTEK NAUKOWYCH W KONTEKŚCIE WSPÓŁPRACY Z PRZEDSIĘBIORSTWAMI W WOJEWÓDZTWIE ŁÓDZKIM

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DOI: 10.2478/minib-2020-0010

ABSTRACT

Marketing communication of scientific units has gained a lot of importance at the time of the emergence and development of the hypermedia environment, in particular the Web 2.0 era. The objective of this article is to assess the degree of use of the website by scientific units in the context of potential cooperation with companies. The article presents the results of research conducted in the period 09.2017–03.2018 using the method of critical analysis of secondary sources in the form of websites of all parameterized scientific units located in the Lodz region. Research of the content of websites of scientific units confirmed that scientific units do not use the available spectrum of marketing communication tools in cooperation with companies and that they do not use the language of market benefits in the description of knowledge being the subject of commercialization.

Key words: online marketing communication, cooperation, scientific unit, R&D

ABSTRAKT

Komunikacja marketingowa jednostek naukowych zyskała znaczenie na znaczeniu w momencie zaistnienia i rozwoju hipermedialnego środowiska komputerowego, a w szczególności ery Web 2.0. Celem artykułu jest ocena stopnia wykorzystania przez jednostki naukowe strony internetowej w kontekście potencjalnej współpracy z przedsiębiorstwami. W artykule przedstawiono wyniki badań zrealizowanych w okresie 09.2017–03.2018 r. z wykorzystaniem metody krytycznej analizy źródeł wtórnych w postaci stron internetowych wszystkich parametryzowanych jednostek naukowych zlokalizowanych w województwie łódzkim. Realizacja badań zawartości stron internetowych jednostek naukowych potwierdziła, że jednostki naukowe nie wykorzystują dostępnego spectrum narzędzi komunikacji marketingowej we współpracy z przedsiębiorstwami oraz że jednostki naukowe nie stosują języka korzyści rynkowych w opisie wiedzy będącej przedmiotem komercjalizacji.

Słowa kluczowe: internetowa komunikacja marketingowa, współpraca, jednostka naukowa, B+R

Introduction

Relations between the world of science and business are a key determinant of innovative economies of the 21st century. Unfortunately, in Poland which ranks 25th in the group of 28 EU countries in terms of innovation (EU, 2017), there are still many barriers limiting or even blocking joint ventures. These barriers are well known and defined in Polish and foreign literature on the subject. Scientists consider communication between both of the environments to be of the crucial importance (Feldy, 2014; Hakansson, 2014; Kleiber, 2004; Kuna-Marszałek i in., 2013; Marszałek, 2010; Mikosik, 2017; Różański, 2013; Sojkin i Michalak, 2017; WEI 2016).

A key role in the constant overcoming of barriers as well as in the future cooperation is played by marketing communication carried out by scientific units, which remain the initiators of commercialization processes. Enterprises which are the recipients of the communication expect to receive assurance concerning the innovativeness of solutions offered and their technological readiness to be implemented.

A pragmatic approach to choosing the optimal model of marketing communication for a specific research unit requires the use of at least

two models in different phases of the commercialization process. Assuming that the mass communication model (in a classic form) is the least effective in science-business contacts, the application of the interpersonal communication model and the communication model in a hypermedia online environment remains to be considered. One of the key factors of effective communication between science and business is the use of opportunities offered by the Internet.

Traditional communication tools are taking on a new shape in the hypermedia computer-mediated environment, which is responsible for a new and hitherto unknown quality of marketing communication concerning: collection, storage, processing, presentation and transmission of marketing information between the sender and the potential recipient of the message (Wiktor, 2013).

The aim of the article is to assess the degree to which research units use the website in the context of building relations with the business environment. The research was carried out in the period 09.2017–03.2018, using the method of critical analysis of secondary sources in the form of websites of all parameterized research units located in the Lodz Voivodeship

Importance of websites of scientific units

The interactive website of a research unit is a fundamental communication tool in the modern world and a key module of integrated marketing communication of research units (Iłowiecka-Tańska, 2013; Radomski et al., 2009).

At the beginning of the century in the United States, Kang and Norton (2006), who analyzed 129 websites of the best universities, Will and Callison (2006), who analyzed websites of 3,738 universities and colleges, as well as Gordon and Berhow (2009), who analyzed 232 university websites, conducted research on the content of university websites and the effectiveness of communication through them. The analysis of 350 websites of the best Polish research institutions (based on the 2011 parametrization results) was carried out by Osica (2012). In turn, Feldy (2015) analyzed 605 websites of scientific institutions

figuring in the Polon system in 2015. The results of both Polish and American studies show a lack of sufficient use of two-way communication provided by the second-generation Internet. In addition, research conducted on the websites of Polish scientific units has shown that the greatest deficiencies in this respect can be attributed to typical research institutions that are not related to the education of students (Iłowiecka-Tańska, 2013).

Websites of scientific units in the conditions of the modern market are trademarks of their potential abilities and the main source of information for enterprises looking for a scientific partner. Thanks to the hypermedia environment, a person interested can find a scientific unit and its website, and then search through its content for the issues of their interest. The appearance of the website (layout), as well as the time and manner of navigation are crucial for the first impression. The publication of information about current research, supported by an invitation to cooperation for entrepreneurs, has a positive impact on the image of a scientific unit as a future business partner. Furthermore, the list of projects implemented into the business sphere creates an image of a commercially active unit to which entrepreneurs apply and where they receive a solution to their problems. The lack of foreign language versions or a description of international cooperation may lead to the creation of an image of a local unit that does not have the support of foreign partners. The image of an unit is also negatively affected by the lack of possibility to navigate using mobile devices. It is also unacceptable that the website is not updated on an ongoing basis (Milczarek and Grębosz-Krawczyk, 2019).

The message communicated by Polish and foreign scientific units leaves no doubt for potential investors as to in which unit they should look for innovative solutions giving market advantage. Western, outstanding scientific units have mastered to perfection the communication conducted through websites, which is one of the cheapest forms of marketing message, additionally being under full control of its owner. The message addressed to the business sphere is analogous to that of enterprises, thus emphasizing the uniqueness of the offer and potential profits. It is difficult to find such an image among Polish research and development units.

The website of the research unit reflects its priorities, which in turn result from its statutory tasks and the algorithm of allocating financial resources. Since the funding (at a non-satisfactory level any way) is not based on the outcomes of the commercialization of knowledge, and the additional revenue comes from EU grants, it is difficult to put the blame on these elements being displayed on the websites. Therefore, in this case one shouldn't look out only for the ignorance and lack of competence on the part of scientific units themselves, but the system of their functioning should be based on the market. Then, as in the case of Western scientific institutions, it would soon be reflected in the layouts of their websites.

Research methodology

In the study, the method of critical analysis of secondary sources, in the form of scientific units' websites was used. The main websites of all the parameterized research units located in the Lodz Voivodeship¹ were analyzed. Among the surveyed units there were different kinds of scientific institutions (public universities, non-public academies, scientific institutes, PAS units). The largest group (23% of the surveyed population) are scientific units operating within art academies in Lodz. Next are scientific units of the University of Lodz (21% of the surveyed population) and of the Lodz University of Technology (18% of the surveyed population), scientific institutes (15% of the surveyed population) and scientific units of the Lodz Medical University (9%). In total, scientific units educating students at different levels of full-time and part-time studies constitute 77% of the examined population.

Due to the fact of having common pages in case of all of the units of the Academy of Music, Academy of Fine Arts, State Higher School of Film, Television and Theatre and Social Academy of Sciences, the analysis of the website was carried out in the above mentioned cases only once, which results in reducing the number of pages evaluated to 45.

The analysis was based on a set of criteria (tab. 1) constructed on the 7C concept by Rayport and Jaworski (2001), developed by Kotler and

Keller (2015). The measurement was of a quantitative and qualitative nature, and its results reflect the use of the possibilities of communication through the scientific unit's own website, in the context of cooperation with enterprises.

The selection of the criteria presented in Table 1 takes into account all of the most important parameters that the homepage of the research unit should be characterized by in order to constitute an efficient communication tool in the process of communicating with enterprises.

Criteria 1, 11 are responsible for the first impression the website of the science unit makes on the visiting entrepreneur. Due to the role played by information in the current world, as well as its very short life cycle, displaying on the homepage of a news item more than a month ago (criterion 11) does not have a positive impact on the reputation of the individual created during the first 30 seconds of navigation.

Criteria 2, 3, 12 and 13 are information and contact criteria, accountable for the easiness of getting in contact with persons responsible for cooperation between the scientific unit and business. Language versions (criterion 13) enable foreign units that want to make use of the Polish solutions to navigate the website. In addition, full language versions (all page tabs translated) also serve as PR, suggesting frequent contacts with units from the international environment. Their lack, on the other hand, clearly suggests the local character of activities carried out by the scientific unit.

Criteria 4, 5 and 9 are product criteria whose task is to present the subject of commercialization in a form that is understandable and encouraging for the entrepreneur. In this criterion, the most important is the language of communication, which should emphasize the market and competitive advantages of solutions offered by the unit. In the case of conducted R&D works (criterion 9), the message should include, apart from the scientific dimension (filling the cognitive gap), also the market aspect of the conducted research.

Table 1. Criteria for evaluation of scientific units' websites

No.	Criterion
1.	Does the layout of the homepage expose the possibility of cooperation between the scientific unit and the business sphere?
2.	Does the homepage contain a subpage tab for entrepreneurs (for business) or any other form of invitation to cooperation for the business sphere?
3.	Are the contact details of persons responsible for cooperation with the business sphere given?
4.	Are there descriptions of knowledge intended for commercialization?
5.	Is the language used to describe the subject of commercialization and research areas the language of benefits?
6.	Is there any information on the website which partners (enterprises, other scientific or local government units) the unit cooperates/cooperated with?
7.	Does the website contain the characteristics of the research staff along with the description of specializations of individual scientists?
8.	Are there descriptions of resources (laboratories, equipment, apparatus, etc.)?
9.	Does the website contain descriptions of current research and R&D work?
10.	Does the website contain a description of international projects implemented by the unit?
11.	Has the website been updated in the last month?
12.	Does the website have at least 1 foreign language version?
13.	Is it possible to communicate directly through the website?
14.	Does the website contain links to the institutional profile (fan page) in social media?
15.	Is the website RWD?

Source: own elaboration.

Criteria 6, 7, 8 and 10 are the reference criteria, whose task is to show the scientific unit's research potential and its ability to cooperate with enterprises credible. International projects carried out by a scientific institution with foreign units recognized in the industry (institutes, international corporations), definitely increase its prestige and provide excellent references in the business environment.

Criteria 14, 15 are the criteria-objectives of the Web 2.0 era and marketing 2.0+ rules. The possibility of correct reading of the website and free navigation using mobile devices (smartphone, tablet) is nowadays a necessity (criterion 15). Whereas combining the official website with the institutional profile in social media, creates a perspective for a website visitor to directly read the opinions and comments of others regarding the unit and its R&D works.

The study assumed the existence of three possible states, for each of the criteria to which points were assigned:

- Criterion fully met: 10 points.
- Criterion partially met: 5 points.
- Criterion not met: 0 point.

Criteria partially met, to which an indirect number of points have been accorded, means that the described feature of the website exists, but the impact it makes on the potential recipient is small. A model example of this phenomenon is information important from the business environment's point of view, placed on subsequent subpages, rarely visited on the first contact. A similar point status was given to the description of R&D work, which was often general, standard and non-personalized. Additionally, 5 points was accorded in cases of incomplete language versions (translation of only one or several selected tabs), as well as for the list of persons responsible for commercialization, described in an ambiguous and illegible way (e.g. providing a contact to the manager of the laboratory working on a new solution or to the promotion/marketing unit). According particular features a score of points allowed to extend the scope of interpretation of the research results with a ranking list of scientific units, in the context of conducting communication with the business sphere, using the company website. Additionally, the scoring directly illustrated the quality of e-communication conducted by scientific units with business in the region. Each of the units could obtain maximum 150 points (15 criteria, weighting 10), which would mean full use of the website as a communication tool in a hypermedia environment. The individual scores obtained by scientific units as a percentage of the maximum value can therefore be considered as the degree to which they use their own website as a tool in their contacts with businesses.

Evaluation of the use of the website as a communication tool in the context of relations with the business environment — research results

The analysis of the research results made it possible to assess the use of the website as a tool for bidirectional information exchange with the business sphere by parameterized scientific units from the Lodz

Voivodeship. At the same time, the research results confirmed the theses put forward by Polish and foreign scientists.

Summing up the points obtained by individual scientific units and determining what percentage of the maximum value (150 points) made it possible to divide the surveyed population into groups of units using the website as a tool for communication with enterprises to a similar extent (Table 2).

Table 2. Division into groups of units using a website to a similar degree for communication with the business environment

Groups	% of points scored	Number of units	% of the surveyed population
Group I	Over 80	2	4
Group II	79-70	9	20
Group III	69-60	8	18
Group IV	59-50	10	22
Group V	Below 49	16	36
Total		45	100

Source: own elaboration.

More than 1/3 of the population is made up of scientific institutions which obtained less than half of the points possible to achieve. This creates a not very optimistic picture, in the context of cooperation with enterprises and at the same time confirms the results of previous research. The website for 58% of the surveyed population (groups IV and V) is not a communication tool through which they can build relations with business. The reasons for this situation may vary from the mentioned system rules, in which the units function, to a lack of conviction that it is an effective tool in contacts with entrepreneurs. It may be that its effectiveness in contacts with students, paradoxically, is a mental impediment to the use of one's own website by research units to contact with entrepreneurs. Only 2 units from the Lodz Voivodeship (group I) received more than 80% of all of the points. One of them (CBI Pro-Academy) is a private, parameterized scientific unit which does not provide teaching classes for students. The second one is the Faculty of Economics and Sociology of the University of Lodz, i.e. a public unit with scientific category A, which educates students. In these two

cases, we are dealing with a deliberate and planned action of using one's own website in order to acquire a business environment for joint ventures. A fact that may inspire optimism is the size of group II (9 units), where minor adjustments of the website (10 additional points, i.e. meeting one criterion) will result in entering the group of units best using the website to communicate with enterprises. On the other hand, group III, consisting of 8 units, is dominated by the departments of the Polish Central Statistical Office and the University of Lodz. In this case, the adjustment should cover several criteria so that the website can be used effectively for communication with enterprises. However, using by these institutions the good practices of twin departments, which are at the top of the ranking, would certainly improve the efficiency of communication through their home websites.

The structural analysis of groups of units (Table 3) shows that in groups I and II, i.e. groups that run their own websites in the most business-friendly climate, there were half of the surveyed research institutes (including the Polish Academy of Sciences units) and only 10% of the faculties of the Lodz University of Technology, i.e. the organization that has the largest interdisciplinary resources for cooperation with business in the region.

Table 3. Website evaluation of particular groups of scientific units in the Lodz region

Scientific institution	Groups				
	I	II	III	IV	V
Artistic research units			1	1	2
The Lodz University	1	3	3	3	2
Lodz University of Technology		1	4	2	3
Scientific Institutes (including PAS units)		4		1	3
Medical University				2	3
Others	1	1		1	3
Total	2	9	8	10	16

Source: own elaboration.

It is also worth noting that the above mentioned groups do not have a representative of any of the artistic and medical units, which may be a result of the traditional perception of the business environment by these institutions, only as a sponsor or patron in certain types of activities.

Below a detailed analysis of the research results is presented.

Using the website to present the possibilities of cooperation between the unit and the business sphere

Only 4 scientific units (9% of the surveyed population) expose on the homepage the possibility of cooperation with enterprises by placing a banner or an eye-catching invitation subpage tab in its central part. These are 3 Institutes and a private scientific unit (CBI Pro-Academy), i.e. institutions that do not organize student education. The remaining 91% of the surveyed scientific institutions do not send a clear message to the business community through their home pages. In the vast majority of cases, however, it is a message addressed to potential and current students, as well as to academic staff. Banners in the top spots of the websites inform about the beginning of the academic year, received study grants or conference dates. This fact unequivocally confirms the current priorities of scientific units, resulting from their statutory tasks and the algorithm of granting funds.

A subpage tab for entrepreneurs

Only 1/3 of the surveyed units (36% of the surveyed population) have a separate subpage tab addressed to enterprises. In 5 institutions (11% of the surveyed population) information for the business sphere is placed on the following subpages or there is a redirection to a unit dealing with the commercialization of knowledge. The remaining 53% of the surveyed units do not take into account the business environment on their main website as a group of recipients to whom the messages are addressed.

Contact details of persons responsible for cooperation with the business sphere

In 40% of scientific units (18 institutions), there are named persons to whom entrepreneurs can address inquiries about joint projects or commercialization of knowledge. In 22% of scientific units (10 institutions), despite the lack of an unambiguous indication of a person responsible for contact with business, the method of deduction can be found on subpages contact details of employees who are likely to take up the subject. In the remaining 38% there is no indication as to whom may be accorded the responsibility of conducting commercial projects. This means that the administration of a scientific institution remains the place from which the entrepreneur should start searching.

Descriptions of knowledge intended for commercialization

Only 2 scientific units have clearly included a description of works currently intended for commercialization on the website. These are 2 industry institutes, or 4% of the studied population. In the vast majority (76% of scientific units), the subpages contain descriptions of the possibility of performing specific research or the area of scope to conduct R&D works. Often subpages also contain descriptions of patent applications or awards won in national and international competitions. However, it is still a matter of guessing how to put them into practical use, as the description does not take into account the issue of commercialization. In 20% of the surveyed population there are no descriptions of knowledge that may be subjected to commercialization.

Language used to describe the subject of commercialization and research areas

A small percentage of the examined institutions (13% of scientific units) presents market and financial advantages resulting from

a possible transfer of the solution to business practice. In the vast majority of units (56% of the studied population) the language used for description is scientific and technical language, to a small extent only taking into account aspects of market competitiveness. 31% of scientific institutions do not have descriptions of conducted R&D works or the language used for their presentation does not present benefits for implementing enterprises.

Partner information

The research units surveyed are keen to identify partners with whom they have conducted or are conducting joint ventures. More than 3 of scientific institutions in the Lodz region, on the homepage or subpages, present a list of companies and other organizations with which they have conducted joint ventures. In the case of another 16% of the surveyed population, information on partners can be found in descriptions of implemented projects and scientific grants. Only 4% of the institutions do not refer, on the website, to institutional contractors from external environment.

Characteristics of the scientific staff along with the individual scientists' description of specializations

The scientific staff is a very important resource for every surveyed unit. Hence its exposure on websites in the majority of institutions (98% of the surveyed population). 40% of the units have detailed characteristics of researchers with a description of their careers and areas of specialization. On the other hand, 58% give only the titles and positions held, without specifying in detail the research issues dealt with by a given employee. A hint in this case, for entrepreneurs looking for information, may be the research scope of the organizational units (Unit, Faculty, Department), in which they are employed. Only 1 scientific institution (Museum of Art in Lodz) has not included a description of its research staff on its website.

Descriptions of resources (laboratories, equipment, apparatus, etc.)

13 research units (29% of the surveyed population) have a full description of the equipment and facilities of the laboratories they have at their disposal, along with a description of the possibilities of performing research, measurements, and analyses. The vast majority of these are institutes and polytechnic units. 56% of scientific units on their subpages provide only general information about the resources they have and the perspective of their use in economic practice. In the case of 15% of the surveyed population, there is no data about equipment that can be helpful in the economic life of enterprises. Descriptions of resources, as well as descriptions of scientific staff, occur in over 85% of the surveyed units. Unfortunately, in most cases (more than 50% of the surveyed population) they are cursory and very general, which definitely hinders clear communication with entrepreneurs.

Descriptions of current research and R&D work

Work on new solutions, which are currently being carried out in scientific units, is at the same time a future commercialization offer, in the context of cooperation with enterprises. It is also worth noting that the description of R&D works is a very strong message of PR, which places a scientific institution in the group of industrial innovators or in the group of organizations detached from the economic reality, in the case of conducting research without market justification. In the Lodz Voivodship 51% of the surveyed population of scientific units places on their websites a quite detailed and easy to find scope of currently conducted R&D works. These are mainly descriptions of research grants and projects financed from EU funds. In the case of 33% of units, the subpages contain general information about research works in which a given institution or its organizational unit specializes, however, there is often a complicated navigation on the website, making it difficult to find information about the research being carried out. The remaining 16% of scientific units do not place on their websites any information about currently conducted R&D works.

Description of international projects implemented by the unit

Units which participate in the implementation of international projects place on their websites information about the titles of the projects, their implementation dates and foreign partners². In the surveyed population, such descriptions can be found on the websites of 80% of scientific units. However, in 44% of the institutions, the information was very easy to find while navigating on the website, and in 36% of the units it was placed on the subpages of the organizational units, which definitely made it difficult to find it. 20% of the surveyed communities does not place data on projects implemented in international cooperation on their websites.

Updating the website

The website is updated by 90% of scientific institutions in the Lodz region. At the time of research, only 3 scientific institutions had information older than 1 month on their websites. Such a large percentage of organizations taking care to update their own website reflects an understanding of the short life-span of information in the Web 2.0 era. This state of affairs is also a proof of the functioning of units or persons directly responsible for communication with the external environment in scientific units, through the website.

Foreign language version of the website

49% of the surveyed population of scientific units have at least 1 full foreign language version of their own website. This means that all of the subpages and their entire content are translated. In 36% of institutions, only the main websites or part of subpages are translated, and this is in part (foreign language texts are an abbreviated version of Polish descriptions). The language in which translations are most frequent is English. 7 scientific units (15% of the surveyed population) have only the Polish version of the website.

The possibility of direct communication through the website

The possibility to send information (e.g. an enquiry) using the contact form on the website of the scientific unit greatly facilitates communication and shortens the transmission time. The entrepreneur is not forced to search the website's resources in order to find topics of interest or persons responsible for R&D works, but by filling in the fields of the form they start the communication process. A properly formulated contact form is the basis for understanding the entrepreneur and formulating the expected answer. Unfortunately, only 27% of the surveyed research units offer this communication channel on the website. In the vast majority (73% of scientific institutions) of units, only telephone or e-mail contact is possible.

Combining the website with the institutional profile (fan page) in social media

The institutional profile in social media gives the possibility of full and free communication with the outside world. It is also a place where independent opinions about the scientific entity and its research are formed. 31 out of 45 examined institutions, i.e. 69% of the population have widgets on the website, clicking on which redirects to the profile in social media. Most often it is Facebook and Twitter. In the case of the remaining 31% of research units, the company's website has no connection to the institutional profile, in any social media. This may also mean that these units do not have their own fan page.

Website responsiveness

Website responsiveness is undoubtedly an advantage while navigating through mobile devices such as tablets and smartphones. Due to the fact that they are an inseparable equipment of today's entrepreneurs, the possibility of reading correctly on them the websites of scientific institutions undoubtedly influences the quality of

communication. Unfortunately, only 42% of the surveyed population of units have websites made in RWD technology. In the case of the remaining 58%, a computer is necessary to display them correctly.

Summary

The research of the content of scientific units' websites confirmed that scientific units do not use the available spectrum of marketing communication tools in cooperation with companies. The website, as the main element of online communication, is undoubtedly a tool with which scientific institutions could conduct two-way information exchange with enterprises in the simplest and cheapest way. However, the results of the research have shown that the use of the range of communication possibilities offered by a website by scientific institutions is incomplete and often random. Thus, one of the most important tools of modern marketing communication does not actively contribute to establishing and maintaining relations between science and business.

Websites of scientific institutions, which are not responsible for the education of students, and their organizational structure is not oriented towards this type of activity, contain more information addressed to the business environment.

The analysis of the websites has also contributed to the statement that scientific units do not use the language of market benefits in the description of knowledge being the subject of commercialization, which is confirmed by the low percentage of scientific units (13% of the studied population) using market arguments in the description of the subject of commercialization. Descriptions of knowledge, which is intended for commercialization, regardless of the medium on which they are contained (leaflets, brochures, presentations) should take into account market aspects of its application. Without this element, they are readable only to a small group of potential recipients who can decode the scientific language.

The overall picture of the activities of scientific units that emerges from the research is not successful. Only to a small extent we deal with the market orientation of the surveyed units.

The completed studies and research induce further deliberations in the area of online marketing communication, directed at the business environment. It seems particularly interesting to compare the results of research obtained in the Lodz region with the results from other voivodeships, taking into account their regional specializations.

Footnotes

¹ According to the CSO database (2017), in the Lodz Voivodeship in 2017 there were 281 units active in research, including 157 in the enterprise sector. Of these, 56 research units were subjected to parametric evaluation and were granted the right to receive funding from the Ministry of Science and Higher Education for 2013–2016. As a result of the 2017 parametric evaluation, the number of parameterized research units in the Lodz Voivodeship was reduced to 54. All of the units subjected to parameterization during the last two evaluations have become the subject of research.

² In the case of projects financed from EU funds, such information is a formal requirement upon signing the contract for co-financing.

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