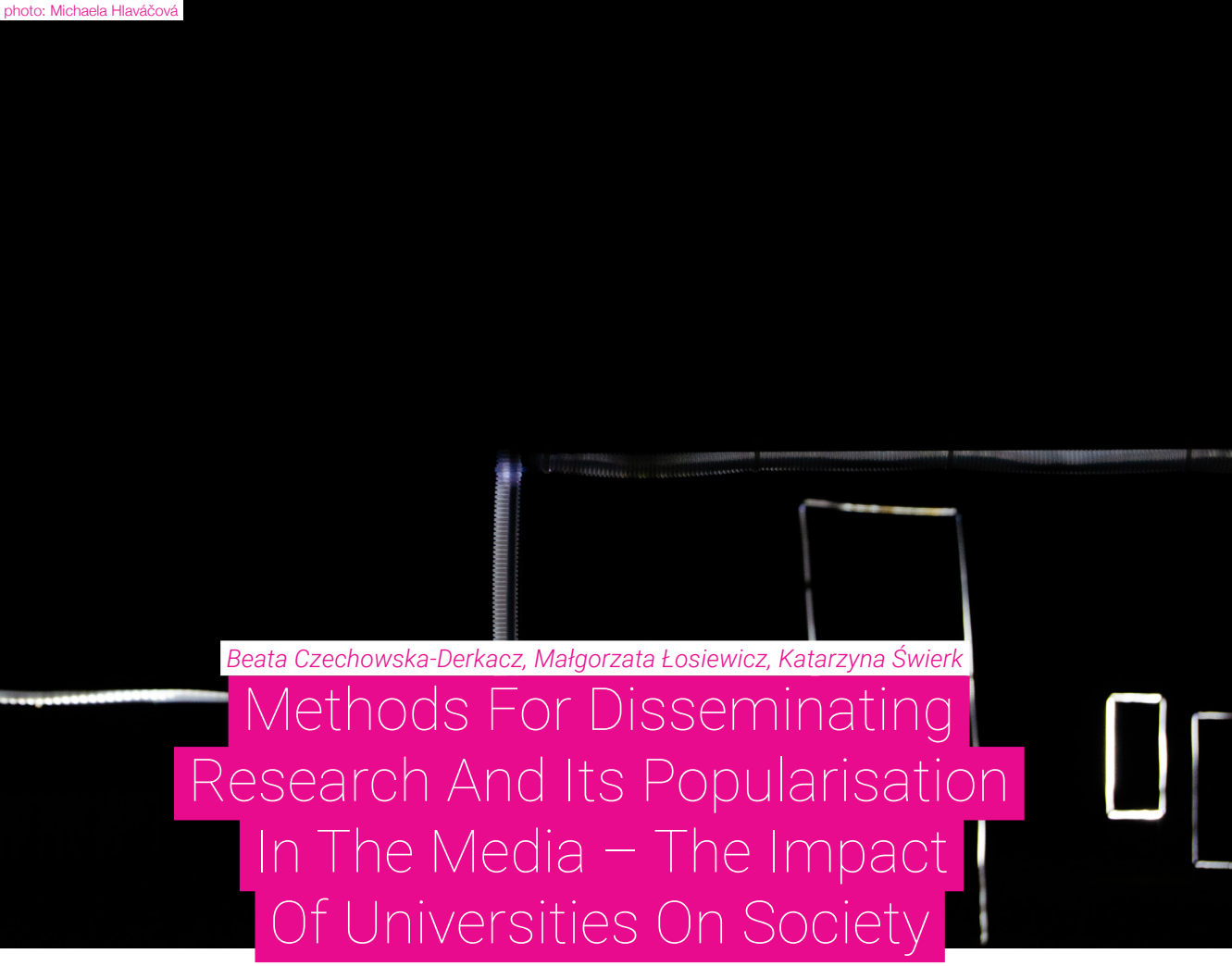
photo: Michaela Hlaváčová

Beata Czechowska-Derkacz, Małgorzata Łosiewicz, Katarzyna Świerk

Methods For Disseminating Research And Its Popularisation In The Media – The Impact Of Universities On Society

ABSTRACT

The new *Law on Higher Education and Science* introduced a new measure for the evaluation of universities in Poland – the impact of scientific activity on the functioning of society and the economy. The aim of this article is to outline the possibilities of universities and scientists in regard to the dissemination of research within two main areas of action. One of them concerns professional efforts towards facilitating access to academic publications (open access publishing, posting articles on platforms and databases for scholars and research institutions, or establishing scientific profiles and university knowledge bases). The second area concerns the popularisation of research in the media by means of public relations (especially media relations). This article presents the view that coordinated activities in those two areas are of key importance for increasing scientific visibility. The ways in which research issues are presented in the media have been shown in the example of media coverage at the University of Gdańsk. The investigation has shown that dissemination of research and science in the media requires increasing the role of professional communicators, for it is possible to shape the agenda setting of academic research using instruments of public relations, taking advantage of the newsworthy character of media coverage.

KEY WORDS

Media relations. Academic research in the media. Public relations. Social impact. Scientific visibility.

1. Introduction

The Law on Higher Education and Science[1], also called the *Constitution for Science or Act 2.0*, is the primary document outlining the scope of autonomous development for each of the Polish research entities. The reform of higher education was aimed at broadening this scope by offering a new, comprehensive approach to the development of academic research as well as the methods for its dissemination, and evaluation of its impact on the economy and society. One of the elements of the reform was a modified system of evaluation of academic institutions, prescribed by the Regulation of the Minister of Science and Higher Education of 22 February 2019 on the evaluation of the quality of scientific activities.[2] The system of research evaluation in Poland is becoming increasingly developed, and its current assumptions are to take into account the specific character of individual academic fields and disciplines. These have been reclassified and limited to 44 disciplines of science and 3 artistic disciplines.[3]

For many years European countries have been developing and improving parametric systems for the evaluation of scientific achievements. Multiple qualitative indicators were taken into account, often supplemented with figures. Nowadays, regardless of the measurable achievements, the third mission of universities is increasingly emphasised - that is, their activity for the benefit of the society, entrepreneurship, and innovation, conducted alongside research and didactic activities.[4] The excellence achieved in the primary mission of university (which is research and education) does not always translate to an extensive pro-social activity or a noticeable impact on the economy and society.[5] Hence the need to define the social impact of science and the methods for measuring it. It is not an easy task, due to difficulties in obtaining quantified data (especially data concerning social sciences and humanities), and due to the diversity of academic disciplines and the scope of their impact.[6]

2. Methods

The purpose of this article is to present the most current methods for disseminating scientific research, employed by universities and researchers themselves, whereas the context of the study encompasses the influence of academic research on the economy and society. This impact is of great importance for the evaluation of academic institutions. Two areas of action have been studied – the activity of universities and academics aimed at enabling the access to their research as well as promotion of research in the media, performed by professional communicators.

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1 Act of 20th July 2018. The Law on Higher Education and Science, Journal of Laws 2018, item 1688.

2 Regulation of the Minister of Science and Higher Education of 22nd February 2019 on evaluation of the quality of scientific activities, Journal of Laws 2019, item 392 as amended.

3 Regulation of the Minister of Science and Higher Education of 20th September 2018 on the fields of study and scientific disciplines and art disciplines, Journal of Laws 2018, item 1818 as amended.

4 See: ZOMER, A. et al.: *The Rise of the University's Third Mission, Reform of Higher Education in Europe*. Rotterdam : The Netherlands Sense Publishers, 2011, p. 81-101.

5 See: MONTESIONS, P. et al.: Third Mission Ranking for World Class Universities: Beyond Teaching and Research. In *Higher Education in Europe*, 2008, Vol. 33, No. 2/3, p. 259-271. [online]. [2020-08-10]. Available at: <https://www.researchgate.net/publication/248961164_Third_Mission_Ranking_for_World_Class_Universities_Beyond_Teaching_and_Research>.

6 See: GALLERON, I. et al.: Valorizing SSH Research: Towards a New Approach to Evaluate SSH Research' Value for Society. In *Journal for Research and Technology Policy Evaluation*, 2017, Vol. 44, No. 44, p. 35-41. ISSN 1726-6629. [online]. [2020-07-30]. Available at: <https://repository.fteval.at/314/>.

In our study we have implemented content analysis (i.e. quantitative research) combined with media discourse analysis (qualitative research).[7] The research was conducted in the form of computer-assisted media monitoring (of various press titles, radio and television, and internet websites, including scientific and scholarly portals).[8] The key word under study was "Uniwersytet Gdański" in the context of scientific activity. The obtained data (publications of the university's scientific research) was then subject to quantitative analysis (that is a study on the frequency of the occurrence of specific terms and their collocations, categorisation of data according to the medium type, reach and scope of a given publication, as well as sources published most frequently). Qualitative research (sentiment and topic analyses) as well as corpus analysis were also conducted. Press releases simultaneously published by the university Press Office were also subject to quantitative and qualitative research. This allowed the study of the impact of professional communicators on the media visibility of the University of Gdańsk. The research covers a three-year time span (from 2015 to 2018) and encompasses research material from 3,527 articles, 766 radio or television news reports, as well as 464 press releases. The case study is the University of Gdańsk.

Such unique combination of corpus analysis and emotive text analysis with topic modelling tools allowed the addressing of research hypotheses regarding methods for disseminating scientific research implemented by institutions and the researchers themselves.

A comprehensive take on the presented problem, both the methods for disseminating science in the media and measures for enabling open access to publications, has also been grounded on phenomenological and hermeneutical approaches, whenever they were found to be applicable in media research. Source analysis of the currently employed means of promoting science as well as eidetic analysis (seeking differences, similarities and common points in the area of universities and researchers' activity) were also included.

Furthermore, the implementation of hermeneutical methodology allowed a critical perspective on the subject matter as well as research assumptions.

2. New Model of Quality Evaluation of Research – Opportunities and Threats

In truth, bibliometric data may be included in the evaluation model, but only as one of the elements of assessment, not its exclusive parameter. The assessment should be supplemented with, or indeed based on an extensive system of expert evaluation.[9]

However, the Polish model as well as the Norwegian, Czech, Finnish or Danish models, have thus far relied mainly on bibliometric data (publications and citations).[10] Here, the expert evaluation (conducted in a form of panels of individual disciplines' experts) was only an element supplementing the system.[11] Countries with greater experience in parametric assessments

[7] See: GACKOWSKI, T., ŁĄCZYŃSKI, M. (eds.): *Metody Badania Wizerunku w Mediach*. Warszawa : Wydawnictwo CeDeWu, 2009.; LISOWSKA-MAGDZIARZ, M.: *Analiza Tekstu w Dyskursie Medialnym*. Kraków : Uniwersytet Jagielloński, 2006.; LISOWSKA-MAGDZIARZ, M.: *Analiza Zawartości Mediów. Przewodnik dla studentów.* Kraków : Uniwersytet Jagielloński, 2004.; PISAREK W.: *Analiza Zawartości Prasy*. Kraków : Ośrodek Badań Prasoznawczych, 1983.

[8] The media monitoring was conducted in accordance with the authors' guidelines by one of the biggest institutions in Poland specialising in the field – *the Institute of Media Monitoring*.

[9] Science Needs to Redefine Excellence. In *Nature*, 2018, Vol. 554, No. 7693, p. 403-404. [online]. [2020-01-25]. Available at: <https://www.nature.com/articles/d41586-018-02183-y>.

[10] See: GUENA, A., MARTIN, B. R.: University Research Evaluation and Funding: An International Comparison. In *Minerva*, 2013, Vol. 41, p. 277-304. [online]. [2020-01-25]. Available at: <https://www.researchgate.net/publication/226632670_University_Research_Evaluation_and_Funding_An_International_Comparison>.

[11] See: KULCZYCKI, E.: Assessing Publications Through a Bibliometric Indicator. The Case of Comprehensive Evaluation of Scientific Units in Poland. In *Research Evaluation*, 2017, Vol. 26, No. 1, p. 41-52. [online]. [2020-08-10]. Available at: <https://doi.org/10.1093/reseval/rvw023>.

(i.e. Great Britain, Italy, France, or Germany) have already implemented extensive expert evaluation models. The most advanced model in Europe is the British system, already in use in the 1980s, currently transformed into the Research Excellence Framework (REF).[12]

The new Polish model for the quality evaluation of research, which comprises elements of parametric assessment used in other European countries, introduces a criterion directly related to measuring the impact of scientific activity on the society and economy. Such a trend in evaluation systems has been developing for several decades. The scientific research and its results are no longer exclusive and available only to a few selected or interested parties. The outcomes of academic research ought to translate into economic progress, innovation and socio-cultural development. Research institutions must therefore open to the needs of the outside world, not only by means of commercialisation of research results, or knowledge and technology transfer, but they need to open also to broadly understood needs of society.[13]

Higher education institutions play a significant role in creating and fostering social innovations that contribute to an improved quality of life. Academic centres and research teams initiate and participate in projects implemented for the sake of the common good. They also adapt their curricula and programmes to meet the needs of the market and the local community.[14]

The evaluation parameter which encompasses the third mission of universities first appeared in the British REF system and was labelled as a *social impact*. It is defined as a certain positive influence that an institution may have on the economy, society, culture, legislation, budget, health, environment or quality of life, outside the scientific world. It also includes the impact on the behaviours and practices, knowledge, awareness and definition of social groups or individuals on a regional, national or international scale. However, it is important to perceive as a form of social impact also reducing an unfavourable phenomenon or damage, or minimising the risk of its occurrence.[15]

The Regulation of the Minister of Science and Higher Education of 22nd February 2019 in paragraph 23 outlines the scope for the assessment of the societal and economic impact of science, which is conducted on the basis of the *impact description*. Similarly, in the British REF system, the assessment is carried out drawing upon the *case studies*. The main objective of such a description of impact is to prove the connection between the research results and development. The same applies to the relationship between scientific or artistic activity, and economy, functioning of public administration, health care system, culture and art, environmental protection, security and defence of the state, or other factors of social development. The number of impact descriptions which can be submitted for evaluation is limited and depends on the academic discipline, and the number of its representatives in the assessed institution. The value of the impact (its scoring) is calculated by external experts. Here, particularly important is the possibility of application of research findings and the value of their reach. The application should be original, reproducible, and creative, whereas the reach should be as large as possible, preferably international.

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12 See: ANTONOWICZ, D.: Doświadczenia Ewaluacji Badań Naukowych w Wielkiej Brytanii w Kontekście Funkcjonowania Research Assessment Exercise 2008. In *Kultura i Edukacja*, 2011, Vol. 2, No. 81, p. 158-173.

13 See: ANTONOWICZ, D. et al.: The Roads of 'Excellence' in Central and Eastern Europe. In *European Educational Research Journal*, 2017, Vol. 16, No. 5, p. 547-567. [online]. [2020-01-25]. Available at: <https://journals.sagepub.com/doi/pdf/10.1177/1474904116683186>.

14 See: KLEIN, J. L.: Social Innovation, Universities and the Quest for Social Transformation, Higher Education in the World 6. Towards a Socially Responsible University: Balancing the Global with the Local. In XAVIER GRAU, F., GODDARD, J., HALL, B. et al. (eds.): *Global University – Network for Innovations*. Barcelona : GUNi, 2017, p. 165-174. [online]. [2020-08-10]. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000248150>; JONGBLOED, B., ENDERS J., SALERNO C.: Higher Education and its Communities: Interconnections, Interdependencies and a Research Agenda. In *Higher Education*, 2008, Vol. 56, p. 303-324. [online]. [2020-01-25]. Available at: <https://link.springer.com/article/10.1007/s10734-008-9128-2>.

15 See more: ANTONOWICZ, D. et al.: The Roads of 'Excellence' in Central and Eastern Europe. In *European Educational Research Journal*, 2017, Vol. 16, No. 5, p. 547-567. [online]. [2020-01-25]. Available at: <https://journals.sagepub.com/doi/pdf/10.1177/1474904116683186>.

In the current Polish system, the legislature grants a good deal of freedom to the assessed institutions in regard to the choice of research results, and their impact. The types of achievements assessed could be various. These can include technologies, models, plans, methods, procedures, recommendations, or expert opinions for external entities. The same is true of their application. The results can be presented during trainings, conferences organised by non-university units or conjointly with their representatives, published free of charge or in a commercialised form, and take place both once and over the course of permanent cooperation. The only obligatory requirement of the impact description is to document that impact. The official confirmation may be submitted in a form of written approval provided by an external entity, a reference letter, an e-mail, a report, non-scientific publications, interviews, press articles, or surveys.[16]

It is a challenge, in a sense, for scientific and research institutions in Poland. In practice, it means a change in the approach to the way research results are disseminated. It also requires that the universities open up to the outside world in order to meet the expectations and needs of the society. Finally, it necessitates an increase in the visibility of a given institution, its researchers and their work in all possible channels of communication. Thus, university's activities aimed at broadening social impact should be conducted on multiple levels: from publishing (where of key importance are: a form of sharing, academic internet platforms, descriptions of publication content prepared in popular science language) to popularisation of researchers' profiles, and use of social media in promoting research results. Owing to the global tendency to acknowledge the impact of the conducted research on society and the economy (not only in research evaluation), new solutions are being created to facilitate the process of dissemination of knowledge. Amongst these there are internet platforms for documenting research findings, and new positions in academic units – namely that of *impact officer/impact manager.*

Within the scope of the *Scopus* database and *SciVal* tool, the so-called *Societal Impact* is already measured, and it takes into account three basic indicators:

- Mass media – indicates the total number of mentions of a given institution in the media (only in the English language) and includes news published on the internet, press cuttings or texts that were originally made available in print, blogs containing entries or posts displayed in reverse chronological order, as well as readers' comments on posts and comments published on blogs.
- Media exposure – indicates the number of mentions in the media measured according to the publication type, demographic data and audience reach. The significance of mentions depends on their reach.
- Field – weighted citation impact – a factor that helps to eliminate the influence of a discipline type on the institution's exposure in media. It is an index of mentions in comparison with the expected world average for a given field, type, and year of publication.

Drawing upon the provided data and measured indicators it is possible to investigate the measurable (according to the presented methodology) societal impact of publications penned by the researchers of a given institution. Such data is collected in the Scopus database; other databases and platforms run by scholarly journals' publishers are currently being prepared to implement similar solutions.

Whether the introduced changes had positive impact on the quality of Polish research and the position of Polish universities in the world rankings, will be judged in a few years' time. But even now, while there is quite a common agreement on the necessity of changes, those currently being introduced spark controversies, and new areas which may generate threats are pointed out. For instance, Grzegorz Węgrzyn, the current Chairman of the Council of Scientific

[16] See: DAŃDA, A. et al.: *Ewaluacja Jakości Działalności Naukowej – Przewodnik*. Warszawa : Ministerstwo Nauki i Szkolnictwa Wyższego, 2019, p. 78-81.

Excellence[17], explaining the reasons behind Poland's low position in international rankings and problems with the scientific development, listed, amongst others, the past difficulties, low level of funding, bureaucracy and formal constraints, the system of evaluation of research units, and the crisis of reviewing and review acceptance. Professor Węgrzyn also pointed out that the new system does not solve a significant part of the aforementioned problems. However, he emphasised the potential of Polish research (a significant potential, also intellectual, of the human capital, its diligence, and good infrastructure and increasing funding).[18]

3. Results – Methods for the Dissemination of Scientific Research

Conducting research entails the need for promoting and reporting scientific achievements, therefore, the dissemination of research results has become an inseparable part of researchers' work around the world. At times, it is an obligation prescribed by external or internal regulations, but increasingly often it is motivated by the desire to shape one's own image and recognition as well as the promotion of an institution in which one works.[19] The very process of creating reports, their visualisation and digital dissemination is not an easy task. Databases and platforms for creating research profiles are aimed at facilitating that process. The scientific or academic achievements and projects, collected in such networks can thus be evaluated with reference to the researcher or team responsible. The data made available as well as the possibility of visualisation and tracking of scientific achievements, given by such databases or internet platforms, significantly facilitate the analysis, evaluation, and management in the field of academic research. Especially now, after the entry into force of new regulations focused on scores and parameters, attention should be paid to the scientific and research visibility of universities and research units, and their employees.[20]

Most Polish higher education institutions offer internal systems or databases in which information about the scientific output of academic teachers is collected. The rules of depositing and the scope of entered data are prescribed by the autonomous internal regulations of the given university. Some of the systems serve as a repository, not only as a database. A good example of such a platform is a system implemented at the Gdańsk University of Technology named the Bridge of Knowledge. It is a comprehensive internet platform where one can find information about the achievements of individual researchers, research teams, journals, research equipment, projects, and conferences. One can find also an open access repository providing direct access to publications.[21] Some universities implement other innovative solutions, such as the repository of the Adam Mickiewicz University in Poznań: AMUR,[22] which can be followed on Twitter.

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[17] The Council of Scientific Excellence (Polish RDN) is a body appointed by the Minister of Science and Higher Education under the new Law on Higher Education and Science of 20 July 2018. The Presidium of the Council comprises members together with its Chairman. The Council consists of eight teams representing various fields of science. It promotes the development of academic staff, in accordance with the highest quality standards of research activity required to obtain academic degrees, art degrees and professor's title. The Council has replaced the Central Degrees and Titles Commission for the supervision of individual promotions of researchers. [online]. [2020-07-30]. Available at: <https://www.rdn.gov.pl/>.

[18] Sourced from a lecture of prof. dr hab. Grzegorz Węgrzyn, *Szanse rozwoju polskiej nauki*, given during the inauguration of the new academic year at the University of Gdańsk on 1st October 2019.

[19] See: OSICA, N., NIEDZICKI, W.: *Sztuka Promocji Nauki. Praktyczny Poradnik Dla Naukowców*. Warszawa : OPI, 2017, p. 7-10.

[20] See: GACA, K.: Śledzenie, Wizualizacja Oraz Ocena Dorobku Naukowego z Wykorzystaniem Bazy Scopus. In *Społeczeństwo Informacyjne*, 2017, Vol. 1, No. 1, p. 14-27.

[21] *The Bridge of Knowledge – Your Knowledge Portal.* [online]. [2020-08-10]. Available at: <https://mostwiedzy.pl/pl/>.

[22] *Adam Mickiewicz University Repository.* [online]. [2020-08-10]. Available at: <https://repozytorium.amu.edu.pl/>.

Taking into account the above and the importance of the presented issue, a quantitative analysis of research profiles of the University of Gdańsk employees has been conducted. Most profiles of authors affiliated with the UG are to be found in the Web of Science database – 2359. A comparable number are to be found in the Scopus database, i.e. 2293.[23]

However, these are mainly profiles automatically established by the system itself, which include only academic publications without the option of supplementing additional data. It is comforting, nonetheless, that researchers increasingly reach to various databases and wish to promote their work through platforms such as ResearchGate, Academia or Google Scholar. It then should be considered, how to further encourage employees to set up academic social networks, and how to facilitate and popularise such activities.

The provisions of the new law impose the necessity of creating profiles in the ORCID system with a view to facilitating future parameterization. However, the implementation of such academic openness cannot be imposed only by a statutory order. Therefore, appropriate incentives and constant awareness of the advantages of such solutions are all the more important.

The University of Gdańsk plans to expand the system of registering the research results of its employees, doctoral students, and students. The Knowledge Base of the University of Gdańsk is to be supplemented with academic profiles whose functions will not be limited to reporting, but they will also promote the achievements of individual researchers and thus the entity to which they are affiliated. In addition, an integral part of the Knowledge Base of the UG is a repository which facilitates archiving and sharing full texts of articles, monographs, chapters, and other documents.

Such a holistic systemic solution allows the collection of the works and their dissemination, thus increasing the visibility of the University of Gdańsk. All of the above were important also in the competition for the title of a research university.

The competition of the Ministry of Science and Higher Education "Excellence Initiative – Research University", held for the first time on 26th March 2019, employed an in-depth analysis of the research achievements of institutions aspiring to the title of research universities. In the application, a given unit was to include a SWOT analysis, which served as the basis for the identification of priority research areas. Every such analysis took into account each unit's achievements divided by fields which correspond to the classification used in the Web of Science or Scopus. These measures allowed for a broad overview of the assessed units' research potential, but also drew attention to new development opportunities. The institutions have developed detailed action plans which will help them to improve the quality of their work and effectively compete with the best academic centres in Europe and in the world. Such measures were implemented, for instance, by the Nicolaus Copernicus University in Toruń, which was ranked in the final ten of Polish research universities in the competition (also in this case the funds of about PLN 1 million from the "Excellence Strategy – Research University" grant were used). The university established, amongst others, special research teams which were to analyse the situation and launched a competition for priority research teams. As a result, five Priority Research Areas and eight Emerging Fields were selected. An in-depth analysis of scientific achievements based on the Scopus database was also conducted. The researchers toured similar universities in Europe, including those located in Hungary and Estonia, which have already implemented improvements in the areas of research and organisation. An audit of the organisations was also conducted, and the unit responsible was the Institute for Higher Education Development.

[23] Data according to the report on the Project 0003/SDU/2018/18 financed within the programme of Ministry of Higher Education and Science "Excellence Initiative – Research University" 2018-2019.

3.1 Media Effects of Research Popularisation

Communication of research has become one of the greatest challenges for the academic units, and its most important purpose is to increase the scientific visibility through the popularisation of research results amongst audiences as wide as possible, including non-specialists.[24] This can be achieved by means of broadly understood promotional and public relations activities (that is popularisation of knowledge in the media and media relations, dedicated marketing strategies, conferences, open meetings/lectures, events, science festivals, open days, or advertising campaigns). It should be remembered, however, that media relations are part of public relations. Aspects of media relations comprise building good and mutually beneficial relations with the media with a view to communicating the messages to the public along with building and maintaining the desired image of an organisation.[25] And public relations, on the other hand, also offer possibilities to popularise the undertakings of organisations and universities. Other outlets for the dissemination of knowledge are social media, blogs, vlogs, cooperation with influencers, and other digital measures (e.g. publishing short films about scientific research or so-called knowledge pills). These are new ways to communicate in the Digital Era.[26] Given the current circumstances, when an excess of information and a lack of media education (allowing the verification of the value/truth of information) is observed, communication of research is a difficult task, but very important at the same time, due to the social responsibility of universities.[27]

This article presents a closer analysis of one of the aforementioned issues - activities aimed at popularisation of research in the media such as daily and weekly magazines, influential magazines, various peer-reviewed popular science journals, radio, television, and the internet. It is an area that provides an opportunity to disseminate research results and document social impact using articles, interviews, expert opinions, and reports.

It is worth noting that the described form of popularising and disseminating academic research is concurrently a tool for building the researchers and universities' image. Thus, a university can be portrayed as an institution which employs the greatest scholars who conduct scientific research at the highest level and serve society with their expert knowledge.[28] Here, the image is defined in the context of public relations as *"the subjective image of a company, organisation, service, product, or person that is created in people's minds, in the external and internal environment (…)".*[29] What is worth stressing here is both the category of identity (i.e. what a university or a scholar says about themselves) and reputation (defined as an opinion about a person or organisation in its external environment).[30]

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[24] See: ŻYREK-HORODYSKA, E., HODALSKA, M. (eds.): *Komunikowanie o Nauce.* Kraków : Wydawnictwo Uniwersytetu Jagiellońskiego, 2016.

[25] OLĘDZKI, J., TWORZYDŁO, D. (eds.): *Leksykon Public Relations.* Rzeszów : Wydawnictwo Newsline i Bonus Liber, 2009, p. 106.

[26] See: BIELIK, P., VIŠŇOVSKÝ, J.: Explanatory Journalism – A New Way How to Communicate in Digital Era. In *Media Literacy and Academic Research*, 2021, Vol. 4, No. 1, p. 24-37.

[27] See: BULGANOVÁ, D., KAČINOVÁ, V.: Axiocentric Teaching and Learning about Media in the Context of School Practice. In *Media Literacy and Academic Research*, 2019, Vol. 2, No. 2, p. 85-93.; KAČINOVÁ, V.: The Topic of Media-Disseminated Mis-Information and Dis-Information as an Integral Part of General Education in Slovakia. In *Media Literacy and Academic Research*, 2020, Vol. 3, No. 1, p. 18-31.; MORAVČÍKOVÁ, E.: Media Manipulation and Propaganda in the Post-Truth Era. In *Media Literacy and Academic Research,* Vol. 3, No. 2, 2020, p. 23-37.

[28] PRUCHNICKA, J.: Media Relations – Promocja Nauki i Instytucji Badawczych w Mediach w Polsce i Europie. In *Marketing Instytucji Naukowych i Badawczych*, 2012, Vol. 2, No. 1, p. 165-183. [online]. [2021-09-12]. Available at: <http://ilot.edu.pl/prace_ilot/public/PDF/spis_zeszytow/222_2012/9_Pruchnicka.pdf>; BINIEWICZ, J.: Mediatyzacja dyskursu naukowego. In GRASZEWICZ, W., JASTRZĘBSKI, J. (eds.): *Teorie komunikacji mediów*. Wrocław : Oficyna Wydawnicza Atut, 2010, p. 189-198.; DIETL, J., SAPIJASZEK, Z. (eds.): *Rola Mediów Masowego Przekazu w Kształtowaniu Wizerunku Uczelni i Jakości Kształcenia*. Łódź : FEP, 2004.

[29] OLĘDZKI, J., TWORZYDŁO, D. (eds.): *Leksykon Public Relations.* Rzeszów : Wydawnictwo Newsline i Bonus Liber, 2009, p. 174.

[30] See: DAVIES, A.: *Public Relations.* Warszawa : Polskie Wydawnictwo Ekonomiczne, 2007.

Investigation on the media visibility of the University of Gdańsk in the years 2015-2018 allows the indication of both the opportunities and difficulties in using the media as a channel for popularisation of research. The study was carried out as a part of a project aimed at increasing the international recognition of the University of Gdańsk activity, and within the framework of the Ministry of Science and Higher Education's "Excellence Strategy – Research University".[31]

Quantitative research has shown that in the years 2015-2018, a total of 464 press releases were sent from *The Office of the Spokesperson for the University of Gdańsk*, including 227 press reports on research, which constitutes 48.9%. At the same time, 3,527 publications concerning the same subject were published on the internet (3,223 or 91%) and in the press (304 or 9%). That constitutes almost 17% of the overall number of publications on the University. Here, the most prominent web portals are: nauka.trojmiasto.pl, naukawpolsce.pap.pl, gdansk.pl, forumakademickie.pl, radiogdansk.pl, and wyborcza.pl. The press titles, on the other hand, include: "Forum Akademickie", "Gazeta Wyborcza Trójmiasto", "Dziennik Bałtycki", "Perspektywy", "Świat Nauki", "Polityka", "Dziennik Gazeta Prawna", and "Rzeczpospolita" (Fig. 1). These magazines are influential websites and daily magazines, mostly with a regional reach (that corresponds to the national reach), and trade journals related to science and research. The overrepresentation of the internet sources stems from the specific character of their functioning – the information presented on the web portals is easily replicated and thus the so-called "media snowball effect" occurs.

FIGURE 1: *Websites and journals publishing papers on the University of Gdańsk*

Source: own processing, 2021

Between the years 2015-2018 a total of 766 materials on the research at the UG were presented on the radio and television, which accounts for almost 30% of the total publications on the University in these media. 1583 broadcasts were noted on the radio (of which 397 or 25% were mentions related to science), while on television they were 1191 mentions (of which 369 or 30% took on the subject of research at the University of Gdańsk) (Fig. 2).

[31] Project report: 0003/SDU/2018/18 financed within the programme of Ministry of Higher Education and Science "Excellence Initiative – Research University" 2018-2019.

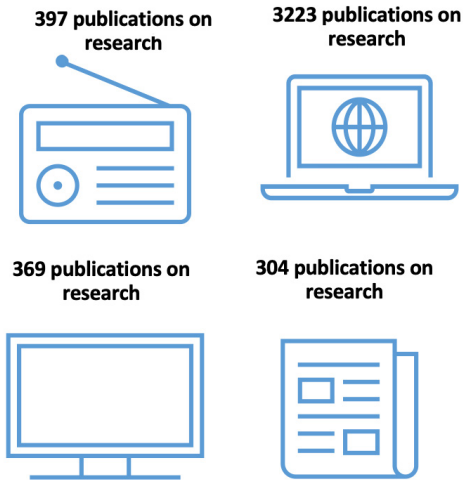

FIGURE 1: *Number of publications on research of the University of Gdańsk in the years 2015-2018*

Source: own processing, 2021

Therefore, the percentage share of materials concerning the University's research activity in relation to all the featured materials on the UG (especially those presented on the internet and in the press) proves that there is still room for improvement.

The reach of the internet and press publications related to research at the University of Gdańsk (i.e. the potential number of recipients who have read or noticed the publications) in the years 2015-2018 was estimated at over 200 million in total. Within that number, 186,183,747 of people could have had contact with materials on the internet (which constitutes 93%), and 14,954,781 might have read the press reports (that is 7%). It is a quantitative survey which does not indicate the actual number of people who read or noticed the publications. However, the numbers illustrate how powerful the media can be in popularising research.

In regard to the qualitative research, an analysis of the so-called *sentiment* can be of use. It is a method which allows the investigation of the emotional characteristics of a given text and thus classify its positive, neutral, or negative reception/overtone. Often employed in research on attitudes of consumers/recipients of services or goods, currently it is particularly useful in the analysis of social media.[32] What is more, the described method dynamically evolves due to the rapid development of IT tools which can be used for such research. The main criterion for classifying the text is the evaluation of emotionally charged expressions. In the investigation of media reports concerning the research at the UG, positive and negative remarks were studied, along with the promotional aspects of a given publication.

As the results of the research have shown, the share of media reports with neutral overtones is significant, whereas materials with positive overtones constitute a small percentage of publications. At the same time, publications classified as negative were nearly negligible.

In regard to materials published on the web portals and in press, almost 90% were neutral, 10% were positive, and 0.003% were negative. Regarding the radio and television, the positive mentions were observed in almost 78% of the reports, while neutral in 22%, and negative in 0.2%.

[32] See: BING, L.: *Sentiment Analysis and Opinion Mining.* Virginia : Morgan & Claypool Publishers, 2012.; KRIPPENDORF, K.: *Content Analysis An Introduction to Its Methodology.* Pennsylvania : The Annenberg School for Communication, University of Pennsylvania, 2018.; NEUENDORF, K.: *The Content Analysis. Guidebook.* Cleveland : Cleveland State University, 2017.; TOMANEK, K.: Analiza Sentymentu – Metoda Analizy Danych Jakościowych: Przykład Zastosowania Oraz Ewaluacja Słownika RID i Metody Klasyfikacji Bayesa w Analizie Danych Jakościowych. In *Przegląd Socjologii Jakościowej*, 2014, Vol. 10, No. 2, p. 118-136. [online]. [2020-07-30]. Available at: <http://www.qualitativesociologyreview.org/PL/Volume26/PSJ_10_2_Tomanek.pdf>.

The qualitative analysis of the publications shows that the topics related to maritime research aroused the greatest interest, for instance the works and expert comments on the Hel Marine Station and scientific research concerning the Baltic Sea. Topics related to research financed by the National Science Centre, National Centre for Research and Development, and Foundation for Polish Science also draw attention. In the latter, however, journalists exhibit greater interest in the outcomes of the grant projects, not the projects themselves, or the fact of winning the competition. The projects carried out under the programmes of research agendas are also very popular, i.e. The International Centre for Cancer Vaccine Science, The International Centre for Theory of Quantum Technologies, and the Biological Station of the University of Gdańsk. Moreover, reports on the successes and prizes awarded to UG scholars are also greatly represented, primarily the Johannes Hevelius Scientific Award of the City of Gdańsk and The City of Gdańsk Jan Uphagen Award for Young Scientists. Projects implemented under the grants of the Foundation for Polish Science as well as its awards (including the "Polish Nobel Prize" for outstanding scientific achievement) also attract interest. Amongst the popular topics are those concerning synergy between science and business, and the possibilities of implementing academic research - especially inventions and cooperation agreements with enterprises.

The scholars mentioned in the media most frequently are associated with the topics of research on cancer, new medications, virology, new technologies, quantum physics, and archaeological discoveries. (Table 1).

The scholar's name and surname	Subject of research project
Grzegorz Węgrzyn	medication for Sanfilippo syndrome
Marek Żukowski Ryszard Horodecki, Paweł Horodecki	quantum physics
Maciej Dębski	research on addiction to new technologies
Arkadiusz Koperkiewicz	archaeological discoveries
Dariusz Szlachetko Marta Kolanowska	new species of orchid
Agnieszka Gajewicz	women in science, L'Oréal-UNESCO award
Ewelina Król	research on the zika virus
Jerzy Zajadło	expertise in the field of law
Adam Lessner and Natalia Gruba	research on the bladder cancer test

TABLE 1: *The most popular research projects and their authors, the scholars of the University of Gdańsk*

Source: own processing, 2021

The subject matter of publications in the media concurs with the press releases issued by The Office of the Spokesperson for the University of Gdańsk. This raises the possibility of creating the University's agenda setting in the media.

The research which contributes to the improvement of quality of life for various groups of people sparks the greatest interest. Such research concerns broadly understood medical issues, biology, environmental protection, new technologies, synergy of science and business, inventions and solutions facilitating or changing everyday life, and forecasts and recommendations concerning various social or natural phenomena.

One of the most desirable forms of cooperation with the media is to invite the University's scholars to comment on presented issues and perform the role of experts. However, most of such materials draw upon sensational news, and present them likewise using slogans such as "they will search for a cure for cancer", "a test for cancer is under study", or "they have discovered a cure". More in-depth materials, interviews, and broader research presentations are rare. These findings are consistent with the 2016 research results on the presentation of

science in Polish weekly magazines (namely "Newsweek", "Polityka", "Wprost", and "wSieci").[33] Successful media relations can be shaped with a number of measures, i.e. formal and informal contacts with media. In regard to the communication of research, the most effective vehicles are press releases, briefings and press conferences, but also newsletters, events or sponsored articles. However, it should be noted that the media effect is a result of multiple concurrent activities: management of expert cooperation (expert opinions of scholars in the media), planning interviews with researchers, and media tours aimed at popularising science, to name a few. Such tours include meetings with editors-in-chief and heads of promotion departments as well as individual meetings with journalists.[34]

4. Conclusion

Activities aimed at popularising research and increasing its visibility can be considered as belonging to social responsibilities, i.e. the third mission of universities (aside from research and education). Broadly understood as creation, the third mission means use and application of knowledge and other academic resources for the benefit of society (or social involvement of the university).[35] This mission conditions the approach to disseminating and popularising research.

The key conclusion which might be drawn from the conducted analyses indicates that Polish universities and research institutions will need to introduce long-term solutions and implement activities in two specific areas. The first concerns building or expanding the appropriate infrastructure to collect data and identify achievements of potential significance for society and the economy (through professional knowledge bases or research platforms). It also means active promotion of research findings through international channels and in English-speaking media along with assigning persons who are proficient in international databases (such as impact officer/impact manager). Offering professional assistance to scientists is also needed. This concerns conducting training in bibliometrics, parameterization, international databases, rankings, building and popularising research profiles as well as cooperation with the media, and public speaking. The second area of actions concerns a change of priorities in regard to promotion, and focusing on popularisation of research in the media.

Moreover, it will be very important to strengthen the role of professional communicators and manage public relations activities, including media relations. Currently media relations at universities remain primarily the responsibility of press spokespersons (or press offices and departments). Some of the advertising and marketing tasks are fulfilled by the promotion and marketing offices. These departments are often diverse in terms of number of employees, hierarchy, and competences, and thus their structure does not always allow for effective operating. In addition, communication of research is often performed by units such as technology transfer centres, departments of science and European programmes, university channels (newspapers, radio, television, websites), and officers for rankings, implementation or cooperation between science and business. Universities have yet to employ a professional *science communicator* who would coordinate cooperation for the popularisation of research in the media (including social media). What is more, the majority of universities do not employ persons responsible solely for the promotion of research and cooperation with the media in that regard.

[33] See: CZECHOWSKA-DERKACZ, B.: Newsowy Charakter Artykułów o Nauce w Polskich Tygodnikach Opinii. In *Horyzonty Wychowania*, 2017, Vol. 16, No. 39, p. 115-133.

[34] See: CZECHOWSKA-DERACZ, B., ZIMNAK, M. (eds.): *Rzecznictwo Prasowe. Oczekiwania i Możliwości. Perspektywa Teoretyczna i Praktyczna.* Warszawa : Wydawnictwo DIFIN, 2015.; WOJCIK, K.: *Public Relations. Wiarygodny Dialog z Otoczeniem.* Warszawa : Agencja Wydawnicza Placet, 2009.; GAJDKA, K.: *Rzecznik Prasowy w Otoczeniu Mediów. Teoria i Praktyka*. Kraków : Towarzystwo Autorów i Wydawców Prac Naukowych UNIVERSITAS, 2012.

[35] See: JASTRZĘBSKA, E., PRZYBYSZ, M. (eds.): *Społeczna Odpowiedzialność – Znaczenie Dla Uczelni i Sposoby Wrażania.* Warszawa : Ministerstwo Nauki i Szkolnictwa Wyższego, 2019.

Finally, it is necessary to understand the expectations of media in regard to the attractiveness of coverage on research. This concerns its comprehensibility, direct impact on an individual, average recipient or specific groups, and society at large. Presenting exclusive and explanatory approaches are also amongst aspects valuable for the media. In this approach, scientists perform the role of experts and authorities who explain complicated phenomena and mechanisms. Last but not least, unique and unusual subjects, making use of controversy, and building a database of experts enables broadcasters to portray academic research in an attractive way.

The aforementioned issues are the challenges which universities, research institutions, research teams, and individual scholars are to face. Successful solutions for these problems will rely on systemic approaches, i.e. increasingly professional actions, relations with the environment, public relations, well-thought-out information policy, and finally strengthening the role of professional communicators.

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