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The Level of Awareness on Scientometrics in Higher Education

Repanovici A[1]., Koukourakis M.[2], Alexandrescu M.B.[3],
Cotoros D[1]., Rogozea L.[1], Popa D.[1]

[1]Transilvania University of Brasov, Romania, arepanovici@unitbv.ro
[2]University Library of Crete, Greece, manolis@lib.uoc.gr
[3]Cultural Center for Social Welfare Brasov, Romania, alexa2bogdan@yahoo.com

Abstract: Following the plenary lecture presentation "Vision and Reality Regarding the Role of Bibliometrics in Scientific Research Evaluation" at an international conference, a new scientific research was initiated. The proposed questionnaire for gathering data was created in SurveyMonkey and was sent to all participants at the conference. The responses came from all over the world: Europe, Asia, Africa, South America and United States. The level of awareness regarding the importance of bibliometrics is high enough and absolutely necessary for libraries and research evaluation. Comments and suggestions are intriguing, interesting and represent an important source of inspiration for further approaches.

Keywords: Bibliometrics; scientometrics; scientific production; academic evaluation.

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Angela Repanovici,[1] Manolis Koukourakis,[2] Mihai Bogdan Alexandrescu,[3]
D. Cotoros,[1] Liliana Rogozea,[1] Daniela Popa[1]

[1] Transilvania University of Brasov, Romania
[2] University Library of Crete, Greece
[3] Cultural Center for Social Welfare Brasov, Romania

Introduction

Measuring information quality is an old and significant issue. The term *statistical bibliography*seems to have been first used by E. Wyndham Hulme in 1922 when he delivered two lectures at the Sandars Reader in Bibliography at the University of Cambridge. Therefore, it is suggested that a better name forthis subject (as previously defined) is BIBLIOMETRICS, i.e. the application of mathematics and statistical methods to books and other media of communication.

Nalimo and Mulkenko defined Scientometrics as "the application of those quantitative methods which are dealing with the analysis of science viewed as an information process."[1]

Scientometrics is defined as "the application of those quantitative methods which are dealing with the analysis of science viewed as an information process."

Nalimov's profound scientific works showed the world that our society needs to see far beyond our time dimension to change the situation of collapse and the disordered state of moral values. Nalimov's concepts of meaning and consciousness expand on a great variety of issues such as mathematics, philosophy, language, and psychology.

Important contributions in bibliometrics development were Lodka,[2] Bradford,[3] Gros & Gros,[4] Zipf,[5] Derek de Solla (1963-64)[6], Eugene Grafield.[7]

Bibliometrics developed as a science being one of the analysis branch used in libraries for research and prediction. By the statistical analysis of the accepted number of papers, the development of a certain scientific domain could be proven.

Maine sources of bibliometric data are WOS, SCOPUS and GOOGLE SCHOLAR.

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[1] *Vasily Vasilevich Nalimov, Z. M. Mul'chenko, Наукометрия, Изучение развития науки как информационного процесса* [Naukometriya, the study of the development of science as an information process] (in Russian) (Moscow: Nauka, 1969), 191.

[2] A. J. Lotka, "The frequency distribution of scientific productivity" *Journal of the Washington Academy of Sciences* 16(12) (1926): 317–324.

[3] Samuel C. Bradford, "Sources of Information on Specific Subjects," *Engineering: An Illustrated Weekly Journal* (London) 137 (26 January) (1934): 85–86

[4] P.L.K. Gross, F.M. Gross, "College libraries and chemical education" *Science* 66 (1927): 386-389.

[5] G.K. Zipf, *Human behaviour and the principles of least effort* (Cambridge, MA: Addison-Wesley, 1949).

[6] Derek J. de Solla, *Little science, big science* (New York: Columbia University Press, 1963).

[7] E. Garfield, "Citation indexes for science: A new dimension in documentation through association of ideas" *Science* 122 (1955): 108–111.

Citation and publication counts are derived from bibliometric databases (Web of Science – WOS, Scopus and to some extent from Google Scholar). More recently, bibliographic databases have also started to display citation counts of publications.[8]

The large part of the objectives and contexts where evaluation of research performance is conducted, productivity is either the most important or the only indicator that should inform policy, strategy and operational decisions.[9] In research community authors form a social network, which is called Research Professionals' Collaboration Network.[10]

There are certain reactions in the academic community regarding the abusive use of scientometric indicators in academic evaluation and especially in the distribution of research funds. Thus, *The Leiden manifesto for research metrics*, and DORA- *San Francisco Declaration on Research Assessment,* occurred and promote academic attitudes leading to a single conclusion: these evaluations must be performed by experts, mainly by experts in information sciences.

All these information within the introduction were presented at the international prestigious conference QQML- Qualitative and Quantitative Methods in Libraries, during the 9th edition that took place in Limerick, Ireland.

Materials and methods

Following the plenary lecture presentation "Vision and Reality Regarding the Role of Bibliometrics in Scientific Research Evaluation" at the QQML conference, a new scientific research was initiated in order to identify the importance of bibliometrics in research evaluation and also the representative bibliometric indicators in quantifying scientific production. The proposed questionnaire for gathering data was created in SurveyMonkey and was sent to all participants at QQML conference. The link to the questionnaire is: https://www.surveymonkey.com/r/92X28TG

Analysis of survey results

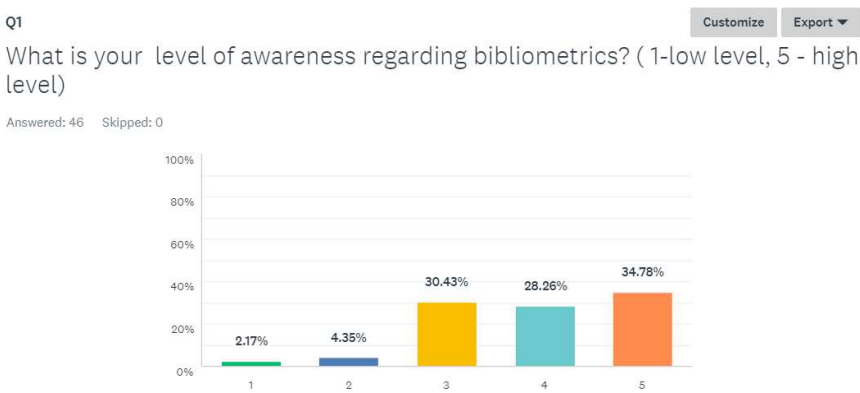

Fig. 1. Results regarding level of awareness in bibliometrics

[8] James Wilsdon, Judit Bar-Ilan, Robert Frodeman, Elisabeth Lex, Isabella Peters, Paul Wouters, "Next-Generation Metrics" 26 (2017). doi: 10.12777/337729.

[9] Giovanni Abramo and Ciriaco Andrea D'Angelo, "How Do You Define and Measure Research Productivity?" *Scientometrics* 101 (2) (2014): 1129–44. doi:10.1007/s11192-014-1269-8.

[10] Anand Bihari, Manoj Kumar Pandia, "'Key Author Analysis in Research Professionals' Relationship Network Using Citation Indices and Centrality." *Procedia Computer Science* 57 (2015). Elsevier Masson SAS: 606–13. doi:10.1016/j.procs.2015.07.414.

The level of awareness regarding bibliometrics and the fact that this level is the highest represents the opinion of 34,78% of the respondents, while 28% are aware of bibliometrics but not at the highest level and 30,43% have an average level of awareness.2,75% of the respondents consider that bibliometrics has no level of awareness while 4,35% consider an average level of awareness regarding bibliometrics. (Fig. 1)

56,72% of the respondents record a strong agreement regarding the fact that bibliometrics is very important for libraries and 32,61% agree to that. A strong disagreement was expressed by 4,35% of the respondents while 6,53% neither agree nor disagree to the question. (Fig. 2)

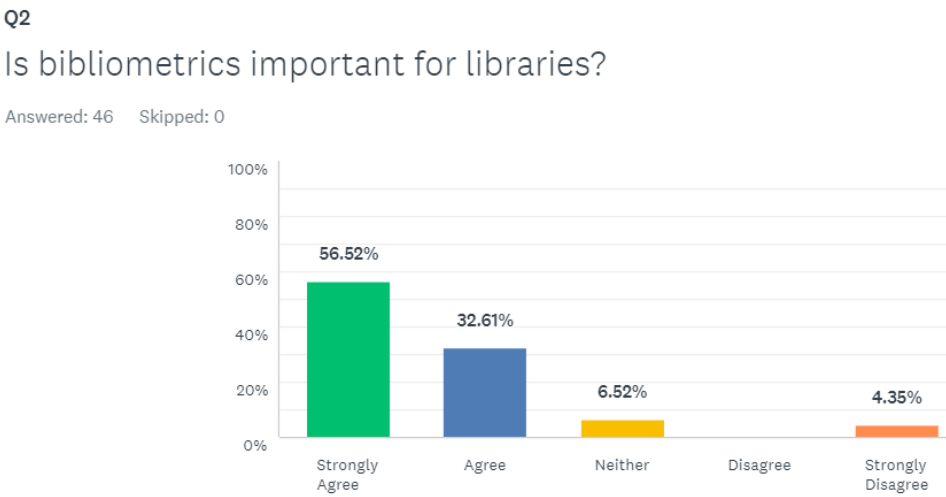

Fig. 2. Responses regarding the importance of bibliometrics for libraries

52,17% of the respondents expressed a strong agreement regarding to the fact that bibliometrics is crucial and important in scientific research evaluation and 34,78% simply agree to that. 8,7% do not agree, while 4,35% neither agree, nor disagree. (Fig. 3)

Concerning the question whom is more important bibliometrics, 32,61% of the respondents consider that bibliometrics is important for research evaluation, 2,71% consider important for library and 65,22% for both. (Fig. 4)

88,37% of the respondents consider that bibliometrics indicators are the most appropriate for appreciating scientific production. Only 6,98% do not agree and 4,65% do not know which indicators are more appropriate. (Fig. 5)

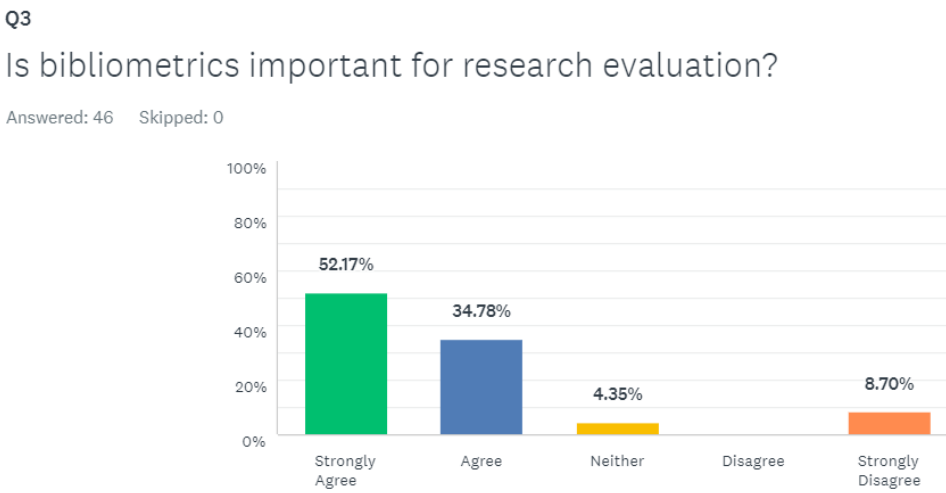

Fig. 3. Results concerning the importance of bibliometrics in research evaluation

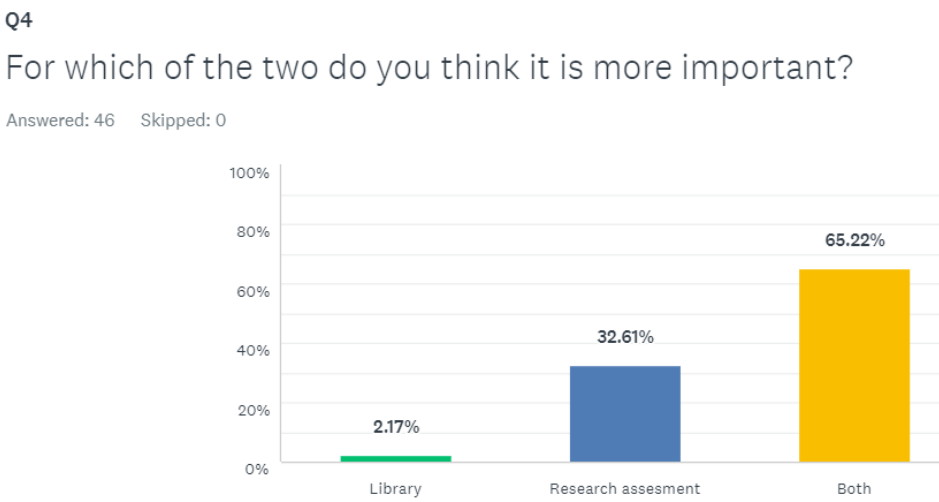

Fig. 4. Evaluation of importance given to bibliometric indicators

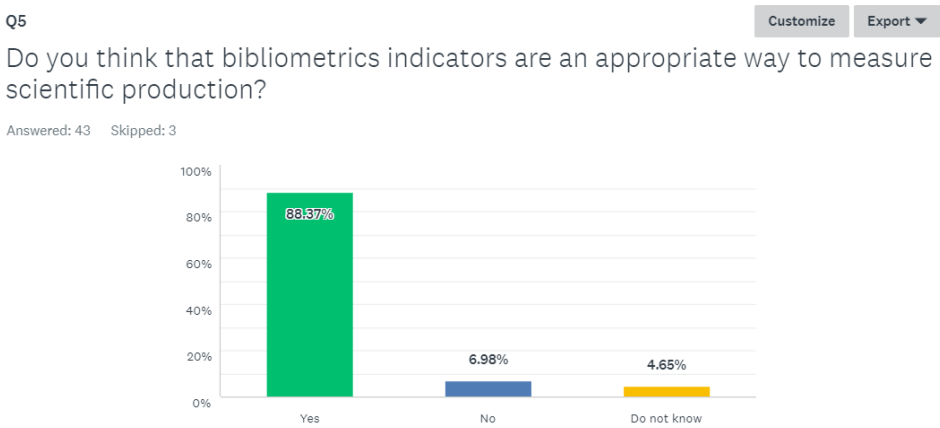

Fig. 5. Responses regarding the appropriateness of bibliometric indicators

There are various opinions in academic communities regarding the abusive use of bibliometric indicators in scientific production evaluation. This issue is highlighted also by the 55/33%, result expressing the pro/against opinion that these indicators are adequate or not. (Fig. 6)

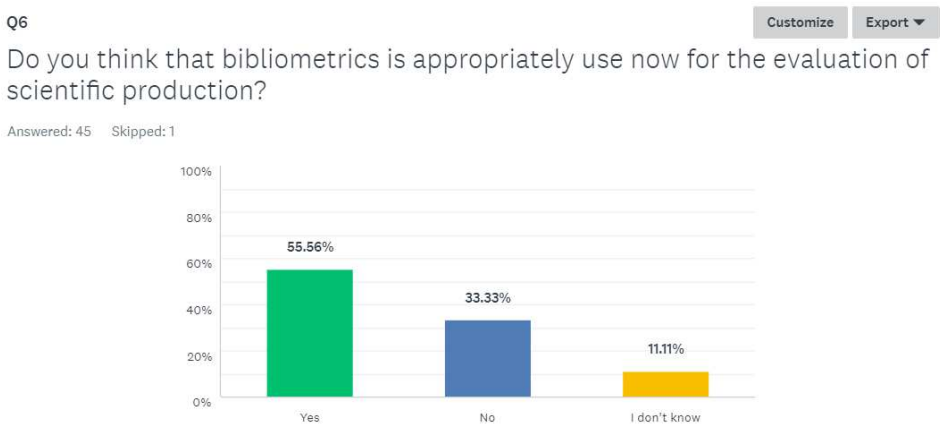

Fig. 6. Responses concerning the use of bibliometrics in scientific production evaluation

95,65% of the respondents consider that Bibliometrics should be included as a subject in the LIS-Library and Information Science curricula. Only 2,17% consider there is no need for that while 2,17% do not know. (Fig. 7)

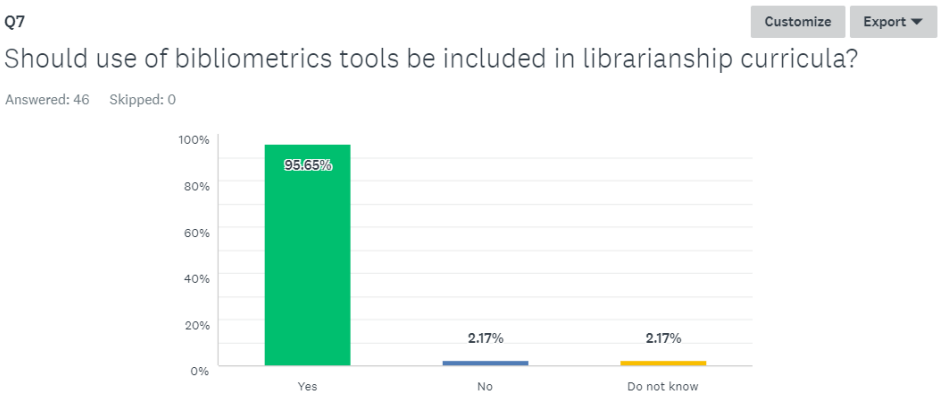

Fig. 7. Results regarding the inclusion of bibliometrics in LIS curricula

Bibliometrics services are offered by 50% of the institutions while in 50% of them, there are no such services. (Fig. 8)

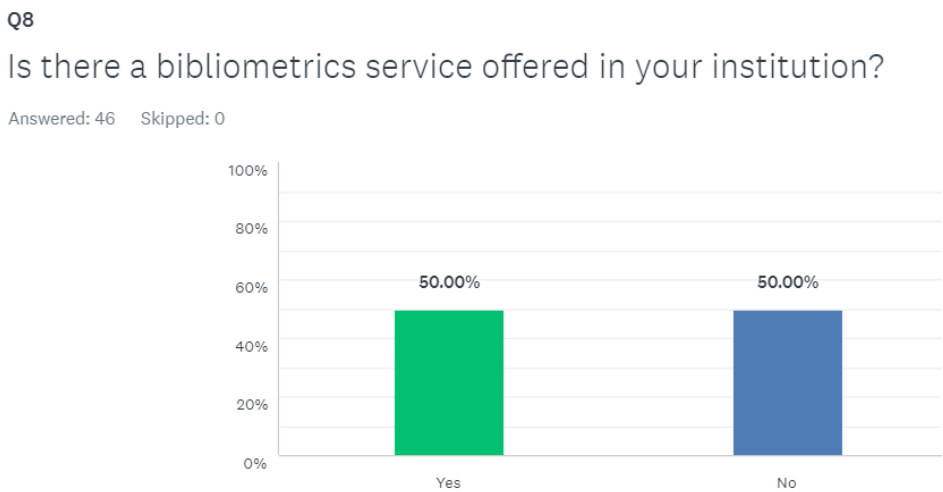

Fig.8. Responses regarding the bibliometrics services in institutions

73,08% of the bibliometrics services are located in libraries and 26,92% are outside the libraries.(Fig. 9)

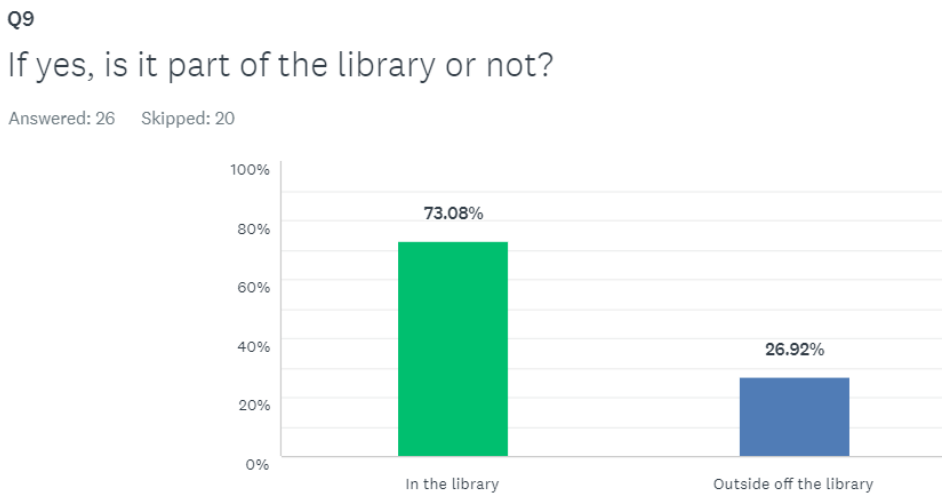

Fig. 9. Results regarding the location of the bibliometric services

Q10: If it is not part of the library which is its place in your institutional structure?

The fact that 73% of the bibliometrics services of the institutions are within the libraries shows a clear recognition of the fact that the experts in information science should be the ones offering these services.

Q11: Where do you think bibliometrics service should be appropriately affiliated?

The answer to the open question regarding the position of the bibliometrics services outside the library showed us that the departments responsible with the university projects or the department of scientific production or the science department or the research department or group of librarians are involved in bibliometrics research.

Q12: Your institution

The selected sample has a large geographic representation; all the continents are represented as shown in table 1. (Table 1, Fig. 10)

Table 1 . Geographic spread of the respondents

Institution	Geographical region
University of Crete Library, Greece	EU
Limerick Institute of Technology, Ireland	EU
University of Piraeus, Greece	EU
Scientific Library of Balti Alecu Russo State University, Moldova	Eurasia
Federal University of Minas Gerais, Brazil	South America
Transilvania University of Brasov, Romania	EU
Academy of Public Administration, Yerevan, Armenia	Eurasia
Academy of Economic Studies of Moldova	Eurasia
Govt. Post graduate college for women satellite town Rawalo, USA	USA
European University Institute – Florence, Italy	EU

Federal University of Technology Owerri Imo State Nigeria	Africa
University of Minho, Portugal	EU
Espirito Santo Federal University, Brazil	South America
Zayed University, United Arab Emirates,	Arabia
Netherlands Cancer Institute, Holland	EU
University of Santo Tomas, Philippines	Asia
Alexander Technological Educational Institute of Thessaloniki-Greece	EU
CIDEHUS - University of Évora, Portugal	EU
Large US research institution,	USA
University of Rhode Island, USA	USA
Petra Christian University, Indonezia	Asia
University of Limerick, Ireland	EU
COMSATS Institute of Information Technology, Islamabad-Pakistan.	Asia
Belarusian National Technical University, Belarus	Eurasia
Aligarh Muslim University, India	Asia
Federal University of Minas Gerais (Brazil)	South America
Penn State University, USA	USA
Fundacao Escola de Sociologia e Politica de Sao Paulo - FESPSP, Argentina	South America

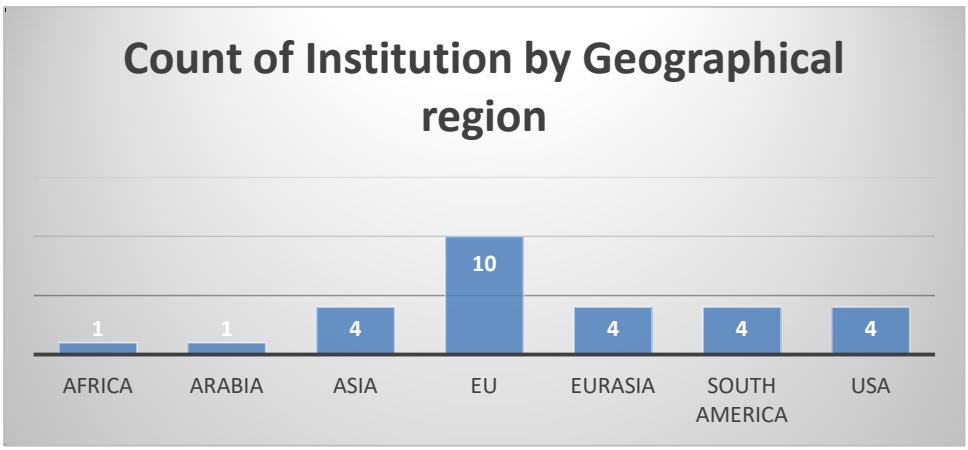

Fig. 10. Geographic spread of the respondents

Most of the respondents, 54,35% are librarians, academic staff is represented by 34,78%, 6,52% are Ph.D. students , 2,71% master students, and other situations 2,17%. (Fig.11) The sample is very well structured consisting mostly of librarians but academic staff is also very well represented.

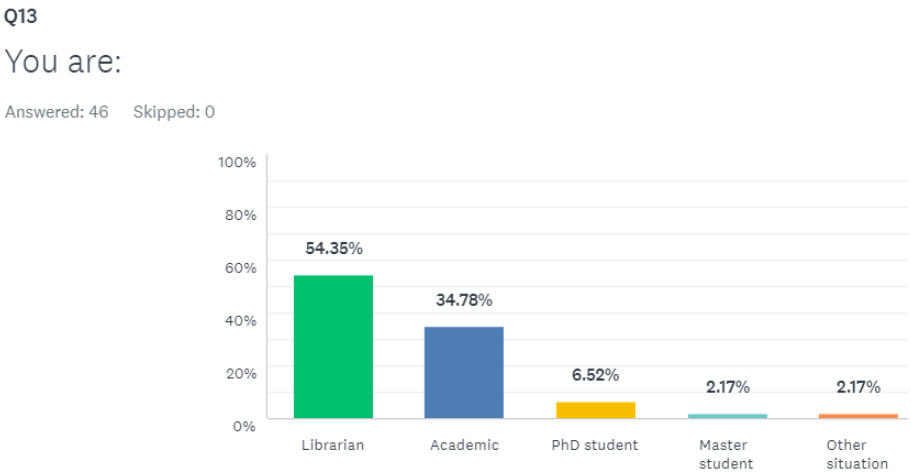

Fig. 11. Respondents profession

The sample structure is well balanced from the point of view of the activity type, 45,65% are persons involved in libraries management, 43,48% are not involved in management and 10,87% are involved in the university management.(Fig. 12)

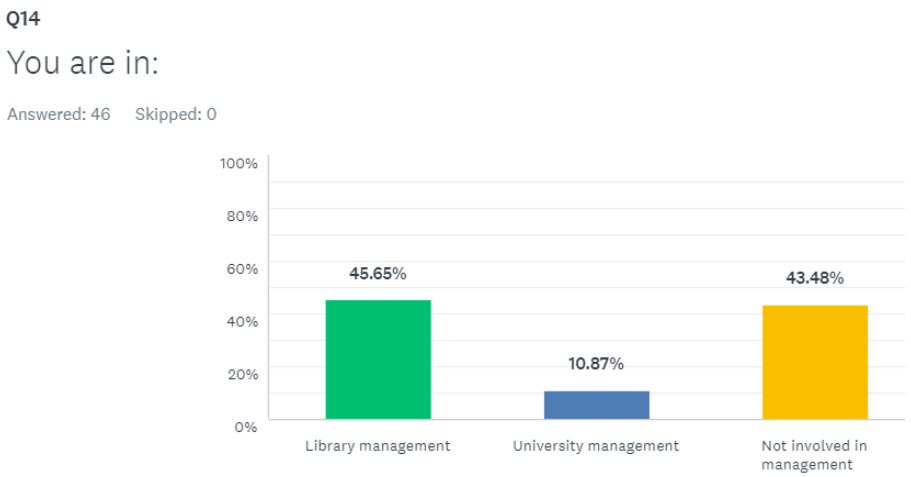

Fig. 12. Respondents involvement in management

71,74 % are female respondents and only 28,26% are male respondents. (Fig. 13)

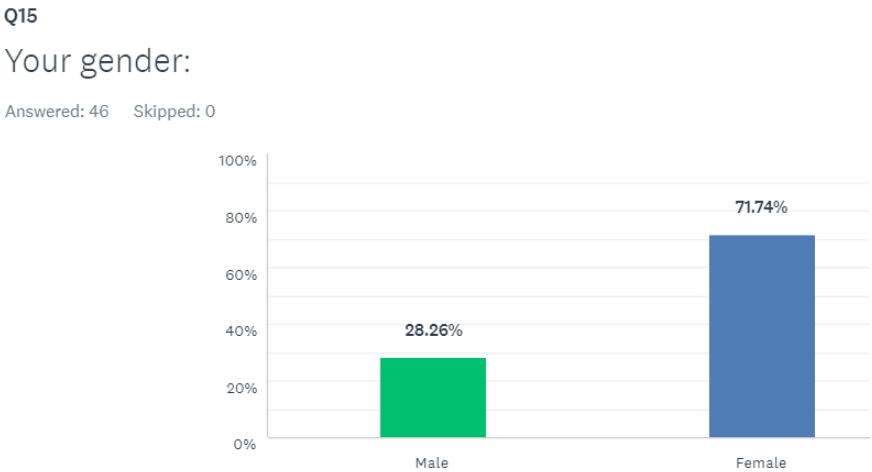

Fig. 13. Respondents gender distribution

Q16: If you have any other comments, suggestions or requests please provide details below:

The comments provided were highly objective and a selection is presented below:

- I believe that bibliometrics can be ONE of the appropriate ways to measure scientific production, if practiced by experts and with respect to the peculiarities of each scientific field;
- Researchers and librarians need knowledge of bibliometry and scientometry;
- The elements of bibliometrics are already being implemented in our institution. However, I think it will have to become a strategic objective of the university;
- Bibliometrics not understood by many in the academic community and there is little awareness within Librarianship;
- Apart from quantitative analysis qualitative aspect also need to focus;
- This is a coming hot topic for library research services. We live in an increasingly assessment -driven that academics understand and until a viable alternative presents itself, it is the best system we have. I think the library profession needs to develop greater expertise in bibliometrics, data management and research skills;
- Bibliometrics is undervalued and because there is lack of international standardized guidance, the level of analysis may vary a lot in different libraries. Including bibliometric work should be included in the statistics of scientific libraries because it may take a lion part of an information specialists;
- Relative to question number 5, I do not think that bibliometrics are appropriate for measuring production but instead impact, so my issue with the question is more semantic than substantive.
- Culture. This need to use evidence for impact of faculty and of universities will not likely go away;
- Combining bibliometrics with newer metrics (Altmetrics, etc.) will be very interesting;
- While I am aware that there are many flaws to the journal ranking system and corresponding bibliometrics, I am also aware that it is the language.

Discussions and conclusions

The awareness regarding bibliometrics and the importance of this branch of information science is at an acceptable level in the education and research institutions and also in libraries. Most of the respondents, that is 92% have a certain awareness level regarding bibliometrics.

90% of the respondents agree that bibliometrics is important for libraries. This result indicates the fact that libraries should be involved in the decision-making process regarding the collections development, in scientific research by research activity or as support institutions.

A slightly smaller number of respondents consider bibliometrics is important in scientific research evaluation with respect to those considering bibliometrics important for libraries.

Scientific production is one of the most used indicators in scientific research evaluation. In case of countries evaluation and classification, most classification systems take into consideration the scientific production of countries, universities, researchers.

Most of them agree that Bibliometrics is an important subject and should be included in every curriculum of LIS schools.

The fact that there is a 50% share of institutions where the bibliometrics service is offered and in 50% of the institutions there is no such service shows that bibliometric researches are still not a priority of the institutions and these indicators are used even without a specialized service.

References

Lotka, A. J. "The frequency distribution of scientific productivity." *Journal of the Washington Academy of Sciences* 16(12) (1926): 317–324.

Hulme, E. W. *Statistical bibliography in relation to the growth of modern civilization*. London, 1923.

Pritchard, A. "North-Western Polytechnic, London, Now at National Computing Centre." *Manchester, Journal of Documentation* 25(4) (1969): 348–349.

Abramo, Giovanni, and Ciriaco Andrea D'Angelo. 2014. "How Do You Define and Measure Research Productivity?" *Scientometrics* 101 (2): 1129–44. doi:10.1007/s11192-014-1269-8.

Bihari, Anand, and Manoj Kumar Pandia. 2015. "Key Author Analysis in Research Professionals' Relationship Network Using Citation Indices and Centrality." *Procedia Computer Science* 57. Elsevier Masson SAS: 606–13. doi:10.1016/j.procs.2015.07.414.

Nalimov, V. V., and G. Colodny. n.d. *Life and the Probabilistic,* Edited by Robert, Reality, New, Svetlana Maltseva, and Svetlana Maltseva. 2013. "Professor V . V . Nalimov: A Man Who Surpassed His Time," 3–6.

Wilsdon, James, Judit Bar-Ilan, Robert Frodeman, Elisabeth Lex, Isabella Peters, and Paul Wouters. "Next-Generation Metrics," 26 (2017). doi:10.2777/337729.