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International scientific publications of Thu Dau Mot University through statistics from 2015 to 2020

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ABSTRACT

International scientific publication is one of the activities that help improve the quality of scientific research and develop the brand name of the university. This paper presents some key features of Thu Dau Mot University's international scientific publications through statistics from 2015 to 2020 based on the following criteria: the number of publications in international journals (included ISI, Scopus and non-ISI, Scopus), field of science, gender and research collaboration. In addition, this paper will discuss some initial identifications: (1) the number of international scientific publications has grown rapidly and steadily over the years; (2) the number of international scientific publications is concentrated in the natural science, engineering and technology; (3) social science and education's contribution in international scientific publications has been limited; (4) there is a significant difference in the number of international scientific publications between male and female scholars; (5) Research collaboration has an important role in the international scientific publications of Thu Dau Mot University.

Keywords: *gender productivity, international scientific publications, research collaboration, Thu Dau Mot University*

1. Introduction

International scientific publication is one of the activities that help improve the quality of scientific research and develop the brand name of the university. In the past ten years, international scientific publications of Vietnam's universities have grown rapidly in

number (an average increase of 20% per year) (Ministry of Science & Technology, 2018). According to statistics from 2010 to 2018, there were a total of 31,966 international scientific publications of Vietnamese authors. Moreover, if using the Index of Scientific Papers per billion USD, GDP in purchasing power parity (STA/bn PPP\$ GDP) belongs to the pillar group Knowledge and technology output in the set of Global Innovation Index (GII) of countries published annually by the World Intellectual Property Organization (WIPO) for review, Vietnam surpassed Thailand in 2018 and ranked third after Singapore and Malaysia in Southeast Asia (Nguyễn Minh Quân et al., 2020). These statistics demonstrate that the number of Vietnam's international scientific publication is gradually integrating deeply with the world's science.

From 2015 to 2020, Thu Dau Mot University has focused on promoting international scientific publication as a core strategy in the university's technological activities (Thu Dau Mot University, 2019). The paper presents the status of Thu Dau Mot University's international scientific publications through statistics from 2015 to 2020 in the following criteria: the number of scientific publications in international journals (included ISI and Scopus), field of science, gender and collaboration. Moreover, this paper will discuss some initial identifications of Thu Dau Mot University's international scientific publication.

2. Literature review

The paper "*Công bố khoa học quốc tế của Việt Nam: Thực trạng và một số khuyến nghị*" assessed the status of Vietnam's international scientific publications from 2000 to 2018 based on data from Web of Science (Nguyễn Minh Quân et al., 2020). The paper's result shows that international publications came mainly from the fields of Natural Science (49%), Medical Science (20.8%), Science and Technology (19.5%). It also points out the importance of international collaboration in the field of science where over 50% of international scientific publications are co-authors. In addition, more than 60% of the total number of international scientific publications in Vietnam are funded by the state budget (Nafosted). From the results, the paper proposes some of solutions and recommendations to promote and improve the quality of Vietnam's international scientific publications, including: (1) apply international scientific assessment standards in ranking science and technology organizations; recruit and appoint scientists' work positions; closely associate the training, arrangement of working positions, working conditions, salaries and bonuses of basic scientific researchers with the responsibility and obligation for international publication; (2) promote international collaboration and integration in research and scientific management, strengthen co-research missions funded by Vietnam and developed countries; (3) organize scientific funding and support programs according to international practices, especially in evaluating the effectiveness of the programs' implementation, in the evaluation, selection and acceptance of scientific tasks; increase funding for basic research, with priority given to funding strong research groups.

Analyzed the current status of Vietnam's international scientific publications, Nguyễn Văn Tuấn in the paper "*Năng suất khoa học Việt Nam qua công bố quốc tế 2011-2015*" provided data to answer three important questions: (1) how is Vietnam's international publication trend in recent times compared to other countries in the region?; (2) how does the transformation of "internal force" of Vietnamese science take place? and (3) does the quality of Vietnamese scientific research decrease in quantity? The data analyzed in the paper shows that in the 15 years from 2001 to 2015, the number of international papers published by Vietnamese in ISI journals was 18076 papers, ranking fourth in Southeast Asia after Singapore, Malaysia and Thailand. In terms of research areas, the top is related to medicine, biology (36.3%), engineering and technology (26%), physics (15%), mathematics (13%) and the lowest is the social and economic sciences (4%) that share of the total number of international publications. For international collaboration, data analysis shows that three-quarters of Vietnam's international scientific publications have collaboration with international universities/institutes. The rate tends to decrease over time but very slowly. For example, from 2001 to 2005, the rate of international collaboration was nearly 80% but from 2011 to 2015, it was 76%. Evaluation of the quality of Vietnam's international scientific publications through the impact index (IF) shows that the IF index of Vietnam's international scientific publications is at a low level, around 1.900 and most has not changed significantly in 15 years. Finally, this paper revealed the effectiveness of international collaboration in international scientific publications of higher quality than those published by Vietnamese scientists. The reason comes from the experience and prestige of foreign experts who can help the authors implement the right research topics and find the right journals for publication.

A comparative study of Vietnam's international scientific publications with other countries in the same region "*So sánh năng lực nghiên cứu khoa học của 11 nước Đông Á dựa trên các công bố quốc tế và bài học rút ra cho Việt Nam provides*" has provided an overall picture of the research capacity of 11 East Asian countries based on criteria such as the number and growth rate of international publications, the number of citations and contributions of Vietnamese authors compared to foreign authors, and the number of international publications in each field of science (Phạm Duy Hiền, 2010). Research's results show that Vietnam, Thailand and Malaysia have a fast growth rate of 15-16% per year?, but the number of international publications of Vietnam is still 6.5 times lower than that of Thailand and Malaysia by 9.5 times. According to the author, national scientific research productivity is correlated with the national economic development rate (GDP). Another remarkable research result is that the quality of scientific research is significantly different between developed countries such as China, Japan, and Taiwan and developing countries such as Vietnam, Indonesia, and the Philippines. It is also reflected in the number of citations due to internal resources and international collaboration. The number of citations from international publications is higher in developing countries than in developed countries. The reason is that the rate of international publication in developing

countries has more international collaboration with Western scholars. However, this reflects a greater dependence on international collaboration from the internal resources of these countries. From the above situation, the author proposes that the Vietnamese government should pay more attention to investing in science and technology to enhance the added value of goods and integrate into the global supply chain. For universities, they need to switch to research university instead of teaching university.

Besides the Vietnam's status in international scientific publications, a number of studies delve into analysis of some other aspects of Vietnam's international scientific publications, such as the trend of international scientific publications and international collaboration through the following papers: *Scientific publications in Vietnam, as seen from Scopus during 1996–2013* (Hồ Mạnh Dũng, 2015), *International collaboration in scientific research in Vietnam: an analysis of patterns and impact* (Nguyễn Văn Tuấn et al., 2017), “*Xu hướng nghiên cứu và hợp tác trong công bố quốc tế của Đại học Quốc gia Hà Nội giai đoạn 2014-2019: Nhìn từ số liệu Scopus và WoS*” (Lê Bá Lâm, 2019); *The Internal Capability of Vietnam Social Sciences and Humanities: A Perspective from the 2008-2019 Dataset* (Hồ Mạnh Toàn et al., 2020); international scientific publication in the context of 4.0 through the paper “*Về vai trò của nghiên cứu trong giáo dục Việt Nam thời đại 4.0*” (Vương Quân Hoàng, 2019); the prospect of international scientific publication in the field of social sciences and humanities through papers: *Gender, age, research experience, leading role, and academic productivity of Vietnamese researchers in the social sciences and humanities: exploring a 2008-2017 Scopus database* (Vương Quân Hoàng et al., 2017), “*Triển vọng hội nhập quốc tế về khoa học xã hội tại Việt Nam: Phân tích từ dữ liệu Network of Vietnamese Social Sciences 2008 – 2018*” (Phạm Hùng Hiệp, 2019); “*Về vai trò của nghiên cứu Dấu ấn KHXH&NV Việt Nam trên các tạp chí quốc tế có hệ số tác động cao năm 2018*” (Trần Trung, Vũ Thị Hạnh & Hoàng Phương Hạnh, 2019), “*KHXH&NV: Hơn một thập kỷ tăng số lượng và chất lượng công bố quốc tế*” (Nguyễn Thanh Thanh Huyền et al.), *Comparative views on research productivity differences between major social science fields in Vietnam: Structured data and Bayesian analysis, 2008-2018* (Vương Quân Hoàng et al, 2020); discussion on solutions and recommendations to promote the quantity and quality of international scientific publications through papers: “*Tạp chí Khoa học Việt Nam: Gợi ý giải pháp hội nhập quốc tế*” (Trần Đức Viên, 2018); “*Giải pháp thúc đẩy công bố quốc tế trong KHXH&NV*” (Phạm Quang Minh & Nguyễn Văn Chính, 2019)...

To sum up, there are a lot of research works on international scientific publication in Vietnam from different approaches. The paper adds an approach to this issue from data analysis of international scientific publication results of Thu Dau Mot University.

3. Finding and discussion

International scientific publications productivity

As a young university, Thu Dau Mot University participates in the "race" of international

scientific publication relatively slowly compared to other universities. After the establishment of the university in 2009, the number of international scientific publications of Thu Dau Mot University was few; however, since 2015 the international scientific publications of the University have begun to increase. If in 2015-2016 the number of international scientific publications in ISI journals was 11 papers, by 2016-2017, this number doubled to 25 papers (of which 12 were published) papers in the ISI journal list, 6 papers in the Scopus journal list and 7 papers in international non-ISI and Scopus journals. In 2017-2018, the number of international scientific publications continued to have a strong acceleration with 43 papers, an increase of one and a half times compared to 2016-2017 (of which the number of articles published in international journals on the list of ISI was more than double compared to the previous year with 27 papers, the number of papers published in Scopus is 9 papers and international journals non-ISI and Scopus were 7 papers). In 2018 - 2019, the number of international scientific publications of the university continued to have a significant growth with 65 papers published in international journals (the number of papers published in journals in the list of ISI continued to increase rapidly with 44 papers, papers published in Scopus doubled over the previous year with 15 papers and papers published in international journals non-ISI and Scopus were 6 papers). However, the year 2019-2020 is a year that marks the outstanding growth of the number of papers published in international journals of Thu Dau Mot University with 160 recognized papers (the number of papers published in international journals). The number of journal papers in the ISI list is 64 papers, the number of papers published in the journals in the Scopus list has significantly increased with 51 papers, 3 times higher than the previous year and the number of papers published in non-ISI, Scopus journals has increased significantly. ISI and Scopus papers also increased 9 times over the previous year with 45 papers) (see figure 1 and figure 2).

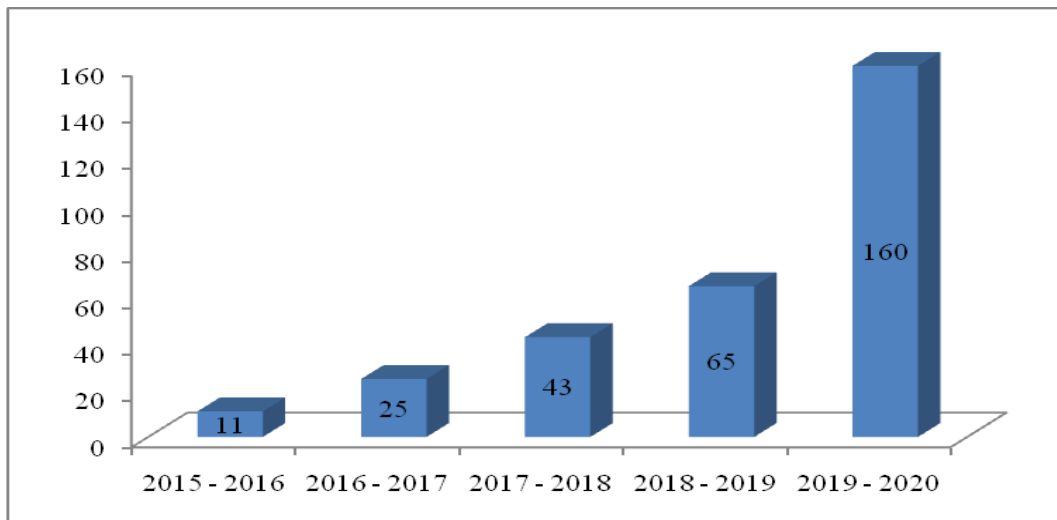


Figure 1. Total number of international scientific publications of Thu Dau Mot University for the from 2015 to 2020

Source: Appendix Decision to publish the papers in international journals from 2015 to 2020

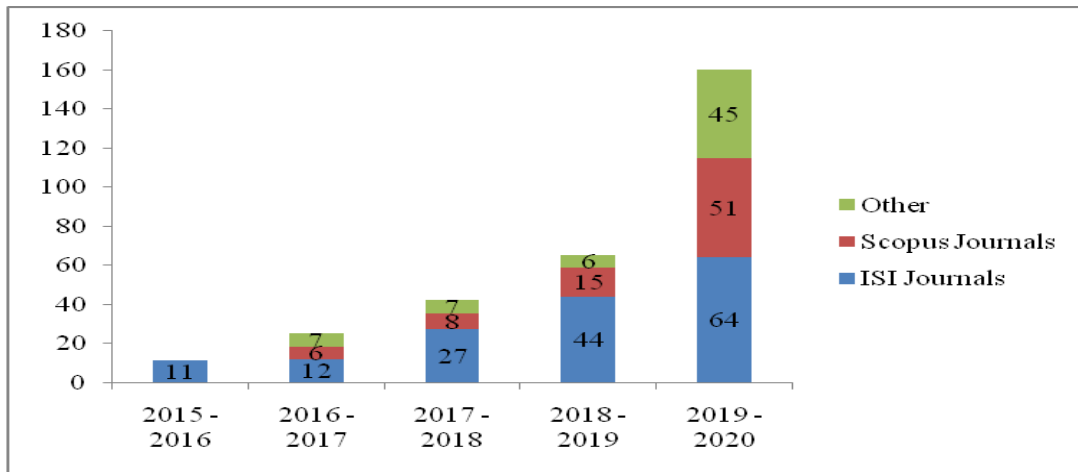


Figure 2. The number of international scientific publications in ISI, Scopus and other (non-ISI, Scopus journals) of Thu Dau Mot University from 2015 to 2020

Source: Appendix Decision to publish the scientific papers in international journals from 2015 to 2020

In 2018, according to statistics on international publication rankings, Thu Dau Mot University entered the list of 50 educational institutions with the highest number of international scientific publications for the first time (rank 42). By 2020, the position on the rankings of Thu Dau Mot University has moved up to 27th position out of 256 Vietnamese universities, institutes, colleges and research institutes with international scientific publications.

Field of science productivity

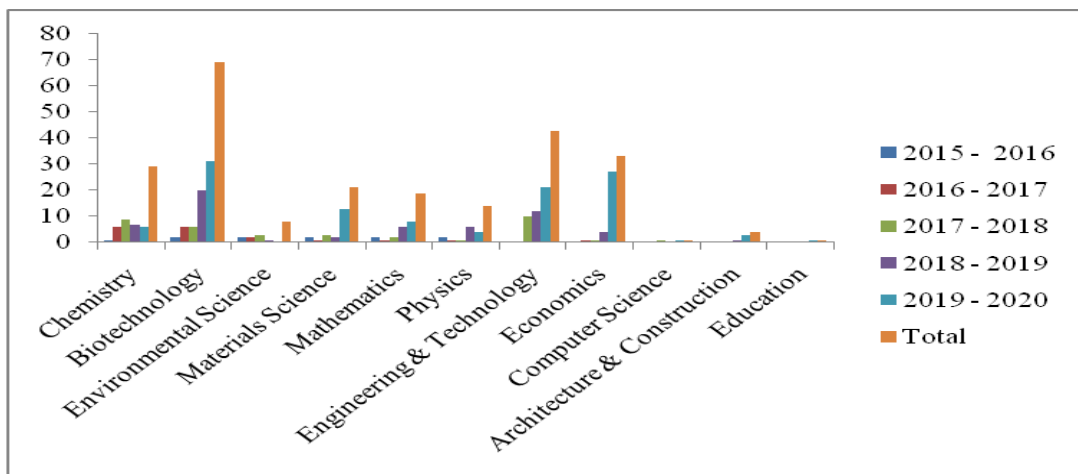


Figure 3. The number of international scientific publications productivity by field of science from 2015 to 2020

Source: Appendix Decision to publish the scientific papers in international journals from 2015 to 2020

According to the statistics in Figure 3, Thu Dau Mot’s international scientific publications focus mainly on the natural sciences, engineering, technology and economics. It is worth noting that the Engineering and Technology, as well as Economics have had a rapid increase in the number of papers published in ISI and

Scopus journals in the past two years, while other fields of science such as Chemistry, Mathematics or Physics have relatively stable growth. Another notable result in the statistics is the absence of international scientific publications in the fields of Social Sciences, Foreign Languages, Education and Law. This shows a large "disparity" in international scientific publications in the field of science. In other words, the capacity to publish international scientific publications of the Social Sciences, Foreign Languages, Education and Law is still limited compared to the Natural Sciences or Engineering and Technology.

Gender productivity

Gender disparity or gender gap in science productivity is another problem. The research indicates that female scholars publish less papers than males (Cole & Zuckerman, 1984; Long, 1992; Xie & Shauman, 1998; Prpić, 2002; Ley & Hamilton, 2008; Larivière et al., 2013; Lone & Hussain, 2017; Astegiano et al., 2019; Huang et al., 2019). In Vietnam, gender gap in science productivity is found in economics and other fields (Vương Quân Hoàng et al., 2020).

According to statistics, there is a significant disparity of gender in Thu Dau Mot's international scientific publications between male and female. Specifically, as shown in Figure 4, the rate of international scientific publications by male scientists is much higher than by females. This percentage is increasingly different year over year. If this rate was only about 2.6 times in 2015-2016, it increased to 8.14 times in 2019-2020.

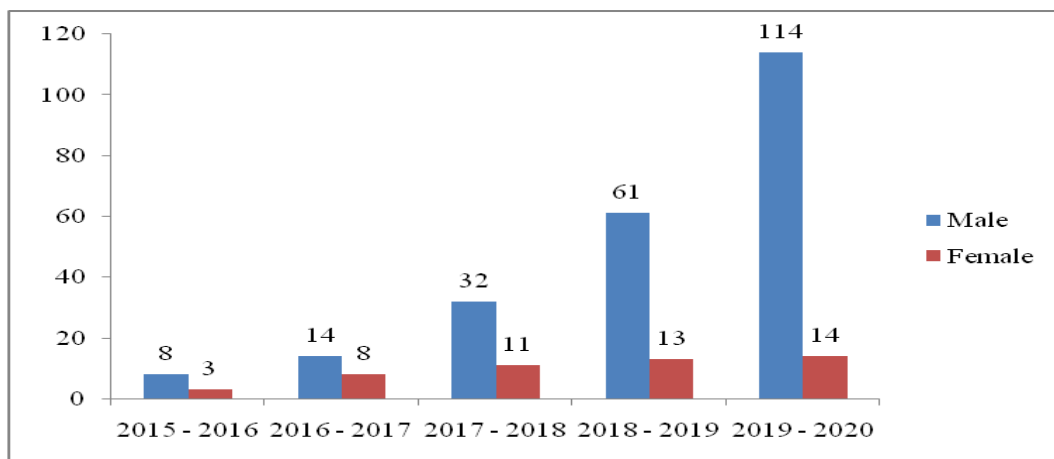


Figure 4. The number of international scientific publications by gender from 2015 to 2020

Source: Appendix Decision to publish the scientific papers in international journals from 2015 to 2020

Research collaboration productivity

Research collaboration plays an important role to enhance scientific capacity and international scientific publications of universities. Figure 5 shows the rate of collaboration between internal and external authors in international scientific publications. It can be seen that the rate of international scientific publications with

external authors' collaboration is much higher than the rate of international scientific publications of internal authors. This difference, on the one hand, shows the importance of external collaboration in scientific research in international scientific publications for Thu Dau Mot University. On the other hand, it also shows that the internal strength of the university's international scientific publications has certain imprints from the research studies written by the Thu Dau Mot's University authors.

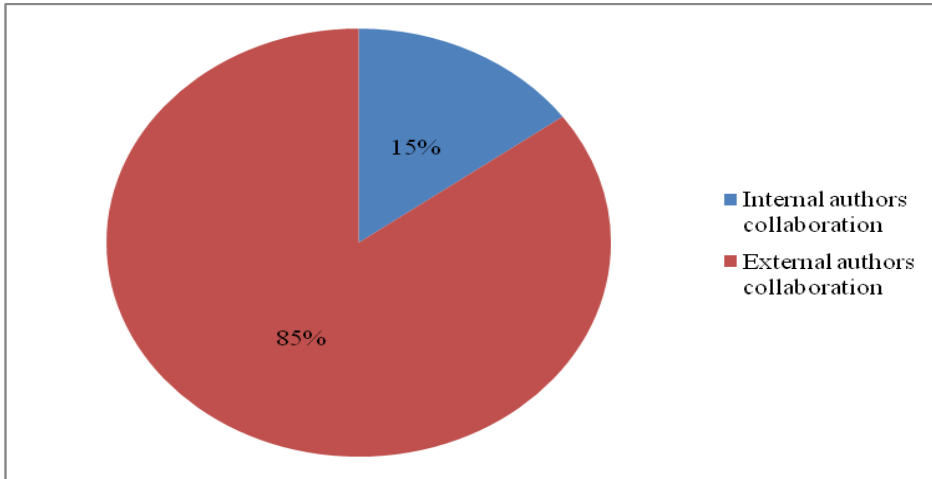


Figure 5. The rate between of internal authors collaboration and external authors collaboration in international scientific publications

Source: Appendix Decision to publish the scientific papers in international journals from 2015 to 2020

Going into more specific analysis, statistics show that the rate of international scientific publications in domestic collaboration is nearly twice as high as that of international scientific publications in international collaboration (Figure 6). It shows that the domestic research network is stronger than the international research network connection at Thu Dau Mot University.

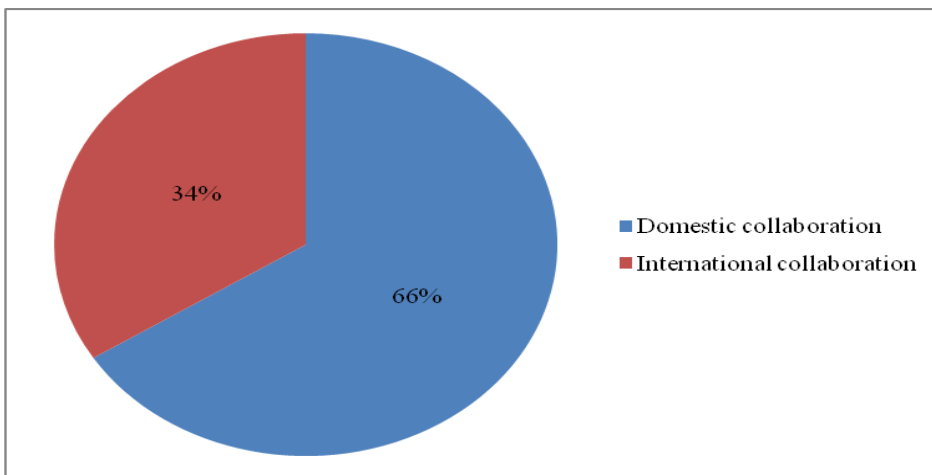


Figure 6. The rate between domestic collaboration and international collaboration in international scientific publications

Source: Appendix Decision to publish the scientific papers in international journals from 2015 to 2020

Through the analysis of statistics on the international scientific publications of Thu Dau Mot University from 2015 to 2020, there are some initial identifications need to be dicussed:

Firstly, the international scientific papers' productivity of Thu Dau Mot University has grown rapidly and steadily over the years, especially in the last three years. The number of international scientific publications shows signs of speeding up in three fields of science: Biotechnology, Engineering & Technology and Economics. Some other fields of science such as Chemistry, Mathematics, Physics have remained stable. In addition, the quality of international scientific publications is confirmed at a high level through the number of papers accepted for publication in ISI and Scopus journals. However, it is a warning sign that the emergence of new fields of science involved in international scientific publications is not much. This may affect the increase of Thu Dau Mot's international scientific publications' productivity in the future.

Second, the number of international scientific publications is concentrated mainly in the field of Natural Sciences, Engineering & Technology and Economics. In the opposite direction, the number of international scientific publications in the field of Social Sciences and Education is very few. Although, this is an overall trend in Vietnam's international scientific publication, the result is still a warning sign for Thu Dau Mot university if they want to become a multidisciplinary university.

Third, the number of international scientific publications has a disparity between male and female researchers. The level of disparity is getting bigger over year although the ratio between male and female lecturers is not much different (the number of female lecturers accounts for 48% of the total number of lecturers). It can affect the professional quality of female scientists when they do not have many papers which are published in international journals. Within the framework of the discussion, we do not have full data to do in-depth research, thereby trying to explain why the disparity in international publications between male and female scientists of Thu Dau Mot University has such a big difference. However, Thu Dau Mot's University leaders should pay attention to this phenomenon by policies to encourage female scholars to participate more in scientific research and international publication.

Finally, the level of collaboration in international scientific publication shows the great connection and collaboration with individuals and research groups. This can be seen as a general trend in international scientific publication activities of universities in Vietnam. Approximately 16% of published papers had multiple domestic authors (i.e., domestic collaboration), and 77% had at least one international affiliation (i.e., international collaboration) during the past 15 years in Vietnam's scientific output (Nguyễn Văn Tuấn et al., 2017). In fact, international scientific publication collaboration will help increase both the quantity and quality of paper and it is also

reflected in line with the strategy towards building strong research groups in Thu Dau Mot University's science and technology development plan by 2030.

4. Conclusion

From 2015 to 2020, the international scientific publication activities of Thu Dau Mot University have had a strong growth in both quantity and quality. It is demonstrated through the increasing number of scientific papers published in ISI and Scopus journals, including those with the Q1. However, besides the bright spots in international scientific publication, there are still issues that need to be addressed, such as the disparity in the rate of international scientific publication between men and women or in international scientific publication between fields. The results also show that the university's international scientific publication activities are concentrated by some outstanding groups and individuals. It is necessary to have more in-depth studies to explain thoroughly the issues mentioned above and thereby find effective solutions to promote the rapid development of international scientific publication activities of Thu Dau Mot University sustainability in the coming years.

References

- Astegiano, J. Gonzalez, S. E. & Castanho, T. C. (2019). Unravelling the gender productivity gap in science: a meta – analytical review. *Royal society open science* 6(6), 181566.
- Cole, J. R. & Zuckerman, H. (1984). The productivity puzzle: persistence and change in patterns in publication of men and women scientists. *Advances in Motivation and Achievement*, 2, 217-258.
- Hồ Mạnh Toàn, Vương Thu Trang, Phạm Thanh Hằng, Lương Phương Anh, Nguyễn Thanh Nhân & Vương Quân Hoàng. 2020. The Internal Capability of Vietnam Social Sciences and Humanities: A Perspective from the 2008 - 2019 Dataset. *Publications*, 8(2), 32.
- Hồ Mạnh Dũng (2015). Scientific publications in Vietnam, as seen from Scopus during 1996-2013. *Scientometrics*, 105(1), 83-95.
- Huang, J. Gates, J. A. Sinatra, R. & Barabasi, L. A. (2019). *Historical comparison of gender inequality in scientific career across countries and disciplines*. Proceedings of the National Academy of Sciences 117(9), 201914221.
- Larivière, V., Ni, C., Gingras, Y. Cronin, B. & Sugimoto, C. (2013). Bibliometrics: Global gender disparities in science. *Nature*, 504, 211-213.
- Ley, J. T. & Hamilton, H. B. (2008). The gender gap in NIH grant applications. *Science*, 05(322), 5907, 1472-1474.
- Lê Bá Lâm (2019). *Xu hướng nghiên cứu và hợp tác trong công bố quốc tế của Đại học Quốc gia Hà Nội giai đoạn 2014 - 2019: Nhìn từ số liệu Scopus và WoS*. Cẩm nang Trung tâm Thông tin - Thư viện. Đại học Quốc gia Hà Nội.
- Loan, A. F. & Hussain, M. (2017). Gender variations in research productivity: Insights from scholarly research. *Library Philosophy and Practice*, 1608.

- Long, J. S. (1992). Measures of sex differences in scientific productivity. *Social Forces*, 71(1), 159-178.
- Ministry of Science & Technology (2018). *KH&CN Việt Nam*. NXB Khoa học và Công nghệ.
- Nguyễn Minh Quân, Nguyễn Thị Phương, Lê Ngọc Bích, Trương Thị Thanh Huyền, Nguyễn Thị Mỹ An, Phùng Thị Hiệp, Cao Hạnh Quyên, Nghiêm Xuân Huy, Nguyễn Thời Trung & Phạm Đình Nguyên (2019). Công bố khoa học quốc tế của Việt Nam: Thực trạng và một số khuyến nghị. *Tạp chí Khoa học Công nghệ Việt Nam điện tử*. Retrieved 31/12/2020 from <https://vjst.vn/vn/tin-tuc/3793/cong-bo-khoa-hoc-quoc-te-cua-viet-nam-thuc-trang-va-mot-so-khuyen-nghi.aspx>.
- Nguyễn Văn Tuấn (2016). Năng suất khoa học Việt Nam qua công bố quốc tế 2001-2015. *Tạp chí KH&CN Việt Nam*, 10A, 49-54.
- Nguyễn Văn Tuấn, Lê Hồ Phương Thảo & Lê Văn Út (2017). International collaboration in scientific research in Vietnam: an analysis of patterns and impact. *Scientometrics*, 110(2):1035-1051. doi:10.1007/s11192-016-2201-1.
- Phạm Hùng Hiệp (2019). Phân tích từ dữ liệu Network of Vietnamese Social Sciences 2008 - 2018. *Tạp chí Giáo dục*, 462(2), 29-35.
- Phạm Duy Hiền (2008). *Khoa học và đại học của Việt Nam qua các công bố gần đây*. Retrieved from 31/12/2020. <http://vietsciences.free.fr/khaocuu/congtrinhkhoaoc/khoahocvadaihocvn.htm>.
- Phạm Duy Hiền (2010). So sánh năng lực nghiên cứu khoa học của 11 nước Đông Á dựa trên các công bố quốc tế và bài học rút ra cho Việt Nam. *Higher Education*, 60(5), 615-625.
- Phạm Quang Minh & Nguyễn Văn Chính (2019). *Giải pháp thúc đẩy công bố quốc tế trong KHXH&NV*. Retrieved 31/12/2020 from <https://ussh.vnu.edu.vn/vi/news/nhan-vat-sukien/giai-phap-thuc-day-cong-bo-quoc-te-trong-khxh-nv-18388.html>.
- Prpic, K. (2002). Gender and productivity differentials in science. *Scientometrics*, 55(1), 27-58.
- Trần Đức Viên (2018). Gợi ý giải pháp hội nhập quốc tế. *Tạp chí Khoa học Việt Nam*, Retrieved 31/12/2020 from <https://tiasang.com.vn/-quan-ly-khoa-hoc/Tap-chi-KH-Viet-Nam-Goi-y-giai-phap-hoi-nhap-quoc-te-12914>.
- Trần Trung, Vũ Thị Hạnh & Hoàng Phương Hạnh (2019). Dấu ấn KHXH&NV Việt Nam trên các tạp chí quốc tế có hệ số tác động cao năm 2018. *Tạp chí Khoa học & Phát triển*. Retrieved 31/12/2020 from <https://doi.org/10.31219/osf.io/vmcsz>
- Thu Dau Mot University (2019). Quyết định 03/QĐ-HĐTr Về việc Ban hành Kế hoạch thực hiện chiến lược phát triển Trường Đại học Thủ Dầu Một đến năm 2030. Lĩnh vực: Khoa học và Công nghệ.
- Vương Quân Hoàng, Hồ Mạnh Toàn, Vương Thu Trang, Nancy Napier, Phạm Hùng Hiệp & Nguyễn Việt Hà (2017). Gender, age, research experience, leading role, and academic productivity of Vietnamese researchers in the social sciences and humanities: exploring a 2008-2017 Scopus dataset. *European Science Editing*, 43(3), 51-55.
- Vương Quân Hoàng, Lê Việt Phương, Vương Thu Trang, Hồ Mạnh Tùng, Nguyễn Minh Hoàng & Hồ Mạnh Toàn (2020). *Comparative views on research productivity differences between major social science fields in Vietnam: Structured data and Bayesian analysis, 2008-2018*. Available at SSRN: <https://ssrn.com/abstract=3488293> or <http://dx.doi.org/10.2139/ssrn.3488293>
- Xie, Y., & Shauman, K. A. (1998). Sex differences in research productivity: New evidence about an old puzzle. *American Sociological Review*, 63(6), 847-870.