International Journal of Evaluation and Research in Education (IJERE)
Vol. 12, No. 3, September 2023, pp. 1336~1345
ISSN: 2252-8822, DOI: 10.11591/ijere.v12i3.25101

Optimizing and strengthening the productivity of lecturer's scientific work

Lina Novita, Ely Sukmanasa, Eka Suhardi, Suhendra
Faculty of Teacher Training and Education, Pakuan University, Bogor, Indonesia

Article Info

Article history:

Received Jul 29, 2022
Revised May 27, 2023
Accepted Jun 13, 2023

Keywords:

Lecturers
Modeling
Productivity
Scientific works
SITOREM

ABSTRACT

The productivity of lecturers' scientific work is an important factor in career advancement, quality of study programs, and university rankings. The research aimed to strengthen and optimize the productivity of lecturers' scientific work. The research method used is modeling and steering optimization (POP-SDM), data analysis using path analysis by looking for mathematical model equations. Scientific Identification Theory of Operation Research in Education Management (SITOREM) analysis is carried out to improve weak indicators and maintain strong indicators. The research was conducted on lecturers at private universities as many as 197 respondents. The qualitative research findings indicate that creativity, academic culture, knowledge management, and professional commitment were mentioned in the interviews. The results of quantitative research prove that creativity, academic culture, knowledge management, and professional commitment affect the productivity of lecturers' scientific work. Research finds novelty through the SITOREM approach, by conducting an analysis to identify indicators of the variables studied in order to determine indicators that are good enough to be maintained and indicators that are still weak and need to be improved. The SITOREM approach can be in the form of a model for developing scientific papers for lecturers as a model of behavior, constellation patterns, and guidelines for the productivity of scientific works produced by lecturers.

Corresponding Author:

Lina Novita
Faculty of Teacher Training and Education, Pakuan University
Bogor, West Java 16129, Indonesia
Email: linovtaz@gmail.com

1. INTRODUCTION

Science and technology have an impact or influence on the structure of higher education [1], [2] The era of technology 4.0 is a challenge for lecturers in carrying out the task of tri dharma which is the impact of these technological developments [3]. The lecturer's mindset needs to be changed so that the competencies they have are getting better or increasing. The task of lecturers is not only teaching, but also needs to develop sustainable research fields that will become part of their lives [4]. Research and dedication should be used as an effort to inform his expertise in science. The findings of the research that have been carried out can be used as a form of productivity of scientific works that are published, read and useful for the community [5], [6].

However, the distribution of data on respondents to 30 lecturers at three universities in the Bogor area in June 2020 shows that the productivity of scientific research results is still not optimal, which means that it needs to be improved. Previous research explained that on average 45.3% of lecturers have not published their research results in national or international journals. In addition, 64.7% of lecturers

have not made teaching materials from the results of research and community service. Around 75.3% of lecturers have not developed their research skills for their careers. This condition is in line with the studies that have been [7], [8].

Byars and Rue [9] stated that scientific work carried out collaboratively is better than scientific work carried out individually. A survey conducted by the organization for economic cooperation and development (OECD) explained that the level of productivity of scientific work carried out by lecturers was still low [10], [11]. The problems are caused by the assumption that research and dedication is needed only when academic promotion, the teaching load is large, the roadmap is unclear regarding research and service, the cost factor also causes lecturers to be reluctant to do research and dedication. Making the final research report that is considered burdensome, the large number of bills in reporting, especially on funded research and service, makes lecturers reluctant to submit research proposals [12]–[15].

In anticipating these conditions, universities as an organization need to optimize lecturers to become human resources who have productivity in making scientific works. Lecturers with high productivity of scientific work will be able to improve their careers and increase university rankings [16], [17]. Therefore, lecturers must continue to improve their quality, both in terms of research and community service. Universities need to continue to explore factors that can affect the productivity of scientific works, so that lecturers can improve their quality [18]. By knowing the factors that can affect the productivity of lecturers' scientific work, it is hoped that it can increase the ranking or ranking of universities and also the lecturers' careers [19]. In addition, factors such as creativity, academic culture, knowledge management, and professional commitment also affect the productivity of lecturers' scientific work [20]–[23].

Productivity is a measure for individuals in carrying out an activity. Productivity is the transforming input to output at the lowest cost [24]–[26]. This concept defines productivity in terms of two main factors, namely input and output. The input aspect or dimension is measured based on the efficiency principle of human resources and organizational factors. While the output aspect or dimension is measured based on the principle of effectiveness which includes the level of goal achievement, the number of outputs, and teamwork. The two main requirements for occupying academic positions in universities are productivity in research and publications [27]–[29]. Productivity is now a keyword in science studies [30].

Writing scientific papers is related to writing research [31]–[33]. Writing scientific papers in the concept of [34] shows the reporting of original research in journals, through scientific papers in a standard format. In a broader sense, scientific writing also includes communication about science through the type of journal articles, such as review papers, summaries of previously published research. Park [35] defined scientific papers reporting from research results contained in journals or in a broader sense covering other ways scientists share research information. Other factors that influence productivity in the form of findings include empowerment, academic culture, knowledge management, and professional commitment. In several studies that have been conducted, there have also been many studies related to these variables or factors [36]–[39]. From the previous theories, it is emphasized that the results achieved by a lecturer in carrying out the duties of the Tri Dharma of higher education in accordance with his expertise and responsibilities in the organization where he works are the meaning of the productivity of scientific work. The aspects or dimensions of scientific work productivity include scientific publications, scientific books, copyrights, patents, and scientific awards.

This research has novelty values in the form of: i) The discovery of new variables that have a positive and dominant effect on increasing the productivity of lecturers' scientific work; ii) Produce a model for strengthening the productivity of lecturers' scientific work as a behavioral model; iii) It was found that the constellation of influences between the variables studied on the productivity of lecturers' scientific work was found; iv) Increased productivity of lecturers' scientific work is produced from optimal solutions; v) The manual is prepared as an effort to increase the productivity of lecturer's scientific work based on the research results. Based on the data, it is necessary to conduct an in-depth study of the productivity of scientific works. The study was conducted to find and analyze the factors that affect the productivity of lecturers' scientific work, so that improvements and refinements can be made.

2. RESEARCH METHOD

Modeling and Optimization of Strengthening Resource Management (POP-SDM) is used as a research method which is an alternative method of sequential exploration. This method was developed by Hardhienata [40]. The initial survey or preliminary research is the first stage carried out at the research site. The purpose of preliminary research is to find out the conditions or topics to be studied in a good condition or still need to be improved. This means whether there is a gap between reality and expectations or das Sein is not in accordance with das Sollen. Interviews were conducted on competent informants to explore important information related to research variables that have a positive and dominant influence on

the main research variables. Then explore the variables that have a positive and dominant effect on the variables that have a positive effect on the main variable. The research stages can be seen in Figure 1.

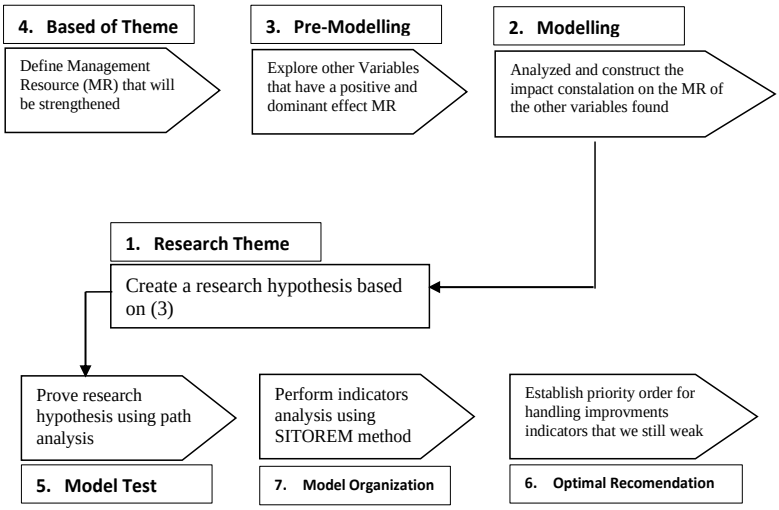

Figure 1. Modelling and optimization stages in research [16]

Optimization of Strengthening Management Resources or POP-SDM can be explained in several stages. First, research theme, determining the management resources to be strengthened or the dependent variable. The research theme stage in this study was carried out by determining the productivity variable of lecturers' scientific work as the dependent variable which is a management resource that will be strengthened. Second, pre-modeling, conducting simple qualitative research in the field to explore other factors or variables that have a positive and dominant effect on the scientific work products of lecturers. Third, modeling, namely analyzing and building a constellation of other variables that have been found against the dependent variable. Fourth, pre-model test, compiling research hypotheses based on the constellation of variables that have been found against the dependent variable. Fifth, model test, conducting quantitative research to prove the research hypothesis using path analysis. Next, optimization model, optimization of quantitative research results through analysis of indicators using the scientific identification theory for operational research in education method (SITOREM). Finally, optimal recommendation, establishes a priority order for the handling of indicators that are still weak for improvement recommendation materials, so that it is beneficial for the organization that is the subject of research [41], [42]. Models that have been validated or have been tested can be used for further analysis or research in order to obtain optimal values from the analyzed or researched model/system. The steps can be seen in Figure 2.

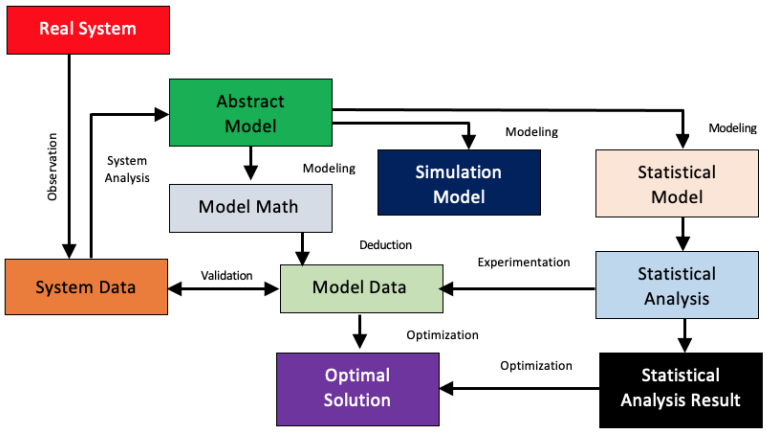

Figure 2. Steps of scientific introduction theory [42]

Then optimization in general can be interpreted as selecting the best solution from the existing solutions in a system. While operations research (operation research) is an interdisciplinary branch of applied mathematics and science that uses mathematical models, computer models, and/or statistical models to obtain the best solution for a system to be operated. In selecting the best solution, the existence of the resource and the accompanying restrictions or limitations should be considered. In the context of correlational and pathway analysis studies, the SITOREM method is used to perform: i) Identification of the strength of the relationship between the independent variable and the dependent variable; ii) Analysis of the value of research results for each indicator of research variables; and iii) The analysis of the weight of each indicator of each research variable is based on the criteria of "cost, benefit, urgency and importance."

Based on the identification the research variables, and based on the weight of each indicator of the independent variable that has the largest contribution, a priority order of indicators that need to be improved and those that need to be maintained can be arranged. Identification of the strength of the relationship (or influence) in research. Correlational between independent variables and dependent variables is expressed based on the magnitude of the correlation coefficient between research variables. The higher the correlation coefficient, the higher the strength of the relationship between research variables. Analysis of the value of research results for each research variable indicator is calculated from the average score of each indicator of each research variable. The average score of each indicator is an illustration of the actual condition of the indicators from the point of view of the research subjects.

The research begins by conducting a simple qualitative study to explore the factors that are considered to have a dominant influence on the resources to be strengthened. The theory in organizational behavior is based on the concept of input-process-output. Input contains independent variables (exogenous) that affect the process and output. Meanwhile, the process level contains intervening variables and the output level contains the dependent variable which is the research theme that will be strengthened. Based on the factors or variables found in the field as well as expert considerations and considerations, a constellation of the effects of these variables on resources will be drawn up so as to produce research hypotheses. After the research hypothesis is generated, the next step is quantitative research to test the hypothesis using path analysis. Based on the results of the path analysis, SITOREM analysis is then carried out to determine priorities for handling indicators that are still weak. The end result of the application of the POP-SDM method is the production of modeling, optimization, recommendations and strategies to improve and strengthen factors or aspects of resource management that are still weak as a priority for handling that has a direct and positive impact on the organization [42].

2.1. Qualitative research

Based on the results of interviews and qualitative surveys of lecturers as informants and expert considerations, the independent variables were obtained in the form of empowerment and academic culture and intervening variables in the form of knowledge management and professional commitment that affect the scientific productivity of lecturers. work. In addition, a constellation model between variables is generated. In qualitative research, the steps taken are as shown Figure 3.

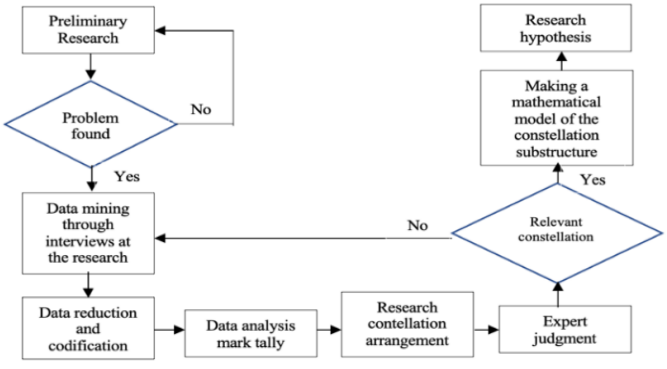

Figure 3. Stages of qualitative research/formulation of research hypotheses

2.2. Quantitative research

Quantitative research was conducted to explain the description of research data for each variable and to test hypotheses using path analysis and correlational analysis to determine the strength of influence and relationships between variables and determine the substructure equation model. Previously tested for

normality, homogeneity and linearity of regression. The research was conducted at three universities in Bogor with a minimum accreditation score of B, namely Pakuan University, Djuanda University, and Ibn Khaldun University, with a population of 920 and a sample using the Cochran formula to 179 respondents. The path analysis phase begins with making path diagrams and structural equations. Path diagrams are used to present problems in the form of images and determine structural equations that state the relationships between variables in the path diagram. The path analysis model tested in this study is shown in Figure 4.

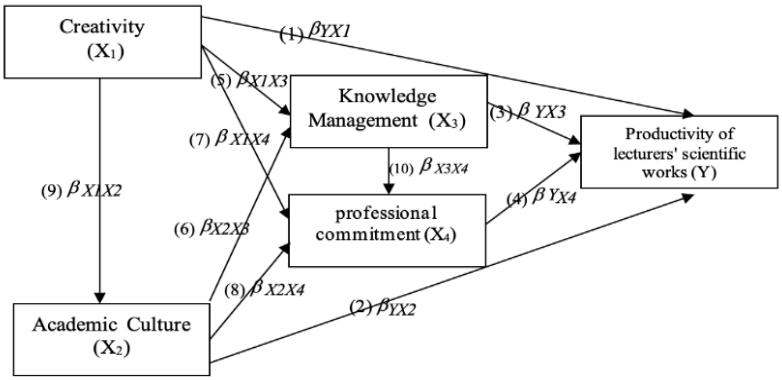

Figure 4. The direct and indirect effects between the research variables

2.3. SITOREM analysis

SITOREM analysis was carried out to identify indicators of the variables studied in order to determine which indicators were good enough to be maintained or developed, and which indicators were still weak so that they needed to be improved with the order of priority for handling improvements set. The basic considerations used in this SITOREM analysis are three criteria, namely i) The strength of the influence between variables; ii) The order of priority for handling indicators assessed by experts; and iii) The average value of indicators obtained from the calculation of respondents' answers to research instruments spread over field. Expert in assessing indicator weights based on aspects of cost, benefit, urgency, and importance. The arrangement of the priority order for handling these indicators is important because in general the management resources are limited, so that the handling of problems must be carried out based on the consideration of the four aspects of management.

3. RESULTS AND DISCUSSION

The data described is data that comes from the score of the results of the research instruments for each research variable which includes the variables of the productivity of lecturers' scientific work (Y), creativity (X1), organizational culture (X2), knowledge management (X3), and professional commitment (X4). Description of the data including the amount of data (sum), the number of data (count), the highest score (maximum), the lowest score (minimum), the average score (mean), the lowest score range (range), the most frequently occurring score. (mode), and standard deviation (standard deviation). The data description also presents statistical descriptions, data frequency distribution, histogram data, and the average score of the research variable indicators. The statistical description results are shown in Table 1.

Table 1. Variable descriptive statistic

No	Description	X1	X2	X3	X4	Y
1.	Lots of data	197	197	197	197	197
2.	Mean	123	148	156	153	130
3.	Median	125	150	157	152	130
4.	Modus	126	153	157	161	127
5.	Standard deviation	7	9	10	8	7
6.	Variants	47	86	101	72	52
7.	Range	38	47	50	44	39
8.	Maximum score	100	121	128	130	107
9.	Minimum score	138	168	178	174	146
10.	Class length	9	10	9	9	8
11.	Many classes	4	5	6	5	5

Processing and analyzing data are carried out through various tests. Furthermore, testing the causality model by conducting path analysis. Through a causal model that is formed theoretically, a path analysis diagram will be obtained and then calculate the coefficient value for each path. The results showed that the 10 coefficients studied had significant path coefficients identified, this is in accordance with the calculation of substructure-1 to substructure-5, as seen from the value of in α=0.05. The empirical path diagram of the study is can be seen in Figure 5.

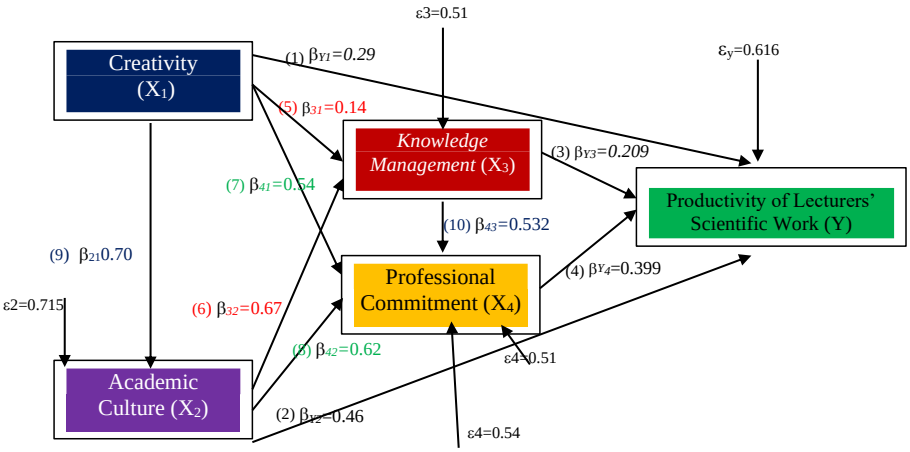

Figure 5. Research path coefficient

Hypothesis testing is used to determine the existence of direct and indirect effects on research variables. Furthermore, the path coefficient is used to determine the hypothesis and significance for each path studied. The test results of all proposed hypotheses can be explained in Table 2.

Table 2 Summary of research hypothesis results

Variables	Path coefficient	t-test	t-table	Test decision/Hypothesis
X1–Y	β_{Y1}=0.88	12.108	1.66	H0 was rejected and H1 accepted. There is a positive direct effect of creativity on the productivity of lecturers' scientific work.
X2–Y	β_{Y2}=-074	5.202	1.66	H0 was rejected and H1 accepted. There is a direct positive effect of academic culture on productivity
X3–Y	β_{Y3}=0.79	6.123	1.66	H0 was rejected and H1 accepted. There is a positive direct effect of knowledge management on the productivity of lecturers' scientific work.
X4–Y	β_{Y4}=0.75	2.443	1.66	H0 was rejected and H1 accepted. There is a positive direct effect of professional commitment on the productivity of lecturers' scientific work.
X1–X3	β_{31}=0.14	2.785	1.66	H0 was rejected and H1 accepted. There is a positive direct effect of creativity on knowledge management.
X2–X3	β_{32}=0.67	5.624	1.66	H0 was rejected and H1 accepted. There is a positive direct effect of creativity on knowledge management.
X1–X4	β_{41}=0.54	9.641	1.66	H0 was rejected and H1 accepted. There is a positive direct effect of creativity on professional commitment.
X2–X4	β_{42}=0.62	10.587	1.66	H0 was rejected and H1 accepted. There is a positive direct influence of academic culture on professional commitment.
X1–X2	β_{21}=-0.70	13.641	1.66	H0 was rejected and H1 accepted. There is a positive direct effect of creative on academic culture.
X3–X4	β_{43}=0.86	23.272	1.66	H0 was rejected and H1 accepted. There is a positive direct effect of knowledge management on professional commitment

After testing the hypothesis, an analysis SITOREM is carried out to correct the weak indicators and maintain the strong indicators. Analysis of the value of the research results for each indicator of the research variable is calculated from the average score of each indicator of the research variable. The average score of each indicator is a description of the actual conditions of these indicators from the perspective of the research subject. This is done through the stages of contribution analysis, research variable indicator analysis, research variable indicator weight analysis, and indicator classification determination analysis. The results of the SITOREM analysis are presented in Table 3.

The figure shows the results of the analysis of the indicators that need to be improved and maintained. Improved indicators with values below 4 while indicators above 4 are defensible indicators [28]. The figure shows the indicators that are still weak and need improvement, as many as 13 indicators shown with numbers below 4.0. These 13 indicators are knowledge acquisition (acquisition of knowledge from sources of knowledge), knowledge storing (storage and documentation of knowledge files), sincerity in carrying out responsibilities, dedication and dedication to the institution, the desire for scientific improvement, skills or expertise development, open communication between employees and leaders, discretion in completing tasks, creativity and innovation in response to change, support and cooperation of the entire academic community, publication, patent, and scientific book. Meanwhile, strong indicators are maintained and developed, among others giving responsibility according to expertise, authority in decision making, consistency in carrying out duties on the basis of expertise, individual and social responsibility, believed academic spirit, the values applied to academic activities, the assessment tradition, knowledge application (practical instructions on how to apply knowledge), knowledge dissemination (dissemination of information about the successful application of a knowledge), knowledge evaluating (evaluation of the usefulness and relevance of knowledge), intellectual property rights, awards [43].

Table 3. Results of the analysis of SITOREM

The order priority indicators improvement	The order of indicators is maintained
Knowledge application (practical instructions on how to apply knowledge) (23.08%) (3.78)	Have a high drive (23.19%) (4.49)
Knowledge evaluating (evaluation of the usefulness and relevance of knowledge) (20%) (3.86)	Have a great curiosity (18.84%) (4.04)
Sincerity in carrying out responsibilities (24.66%) (3.86)	Full of confidence (21.9%) (4.06)
Dedication to the institution (19.18%) (3.86)	Happy to seek new experiences (26.86%) (4.05)
The desire for scientific improvement (16.44%) (3.8)	Believed academic spirit (20.49%) (4.46)
Skills or expertise development (20.29%) (3.99)	The values applied to academic activities (19.40%) (4.05)
Have broad insight (20.39%) (3.84)	Support and cooperation of the entire community (17.91%) (4.09)
Discretion in completing tasks (14.92%) (3.34)	Knowledge acquisition (20%) (4.42)
Creativity and innovation in response to change (17.79%) (3.7)	knowledge from sources of knowledge) (20%) (4.42)
Assessment tradition (14.92%) (3.34)	Knowledge dissemination (dissemination of information about the successful application of a knowledge) (21.54%) (4.46)
Publication scientific book (16.42%) (3.7)	Knowledge storing (storage and documentation of knowledge files) (15.38%) (4.04)
Scientific book (16.42%) (3.7)	Intellectual property rights (IPR) (7.91%) (4.04)
Patent (23.88%) (3.4)	Awards (17.91%) (4.42)

Based on the results of hypothesis testing, it can be concluded that creativity has a positive and significant direct effect on the productivity of lecturers' scientific works. These findings provide evidence that empirically the increase in empowerment carried out by an institution/organization will have an impact on increasing the productivity of lecturers' scientific work [34], [44]–[46]. The understanding of productivity can have continuity with the duties of lecturers in the Tri Dharma of higher education. In the 2014 Minister of Education and Culture regulation number 92, the main task of lecturers as professional educators and scientists is to transform, develop and disseminate science, technology and art through Tri Dharma: education, research, and community service. Internal factors such as a good academic culture can have an influence on the productivity of lecturers' scientific work [36]. Increasing the productivity of lecturers' scientific works can be done by strengthening knowledge management [47].

Knowledge management gives a good influence on the performance of research conducted by lecturers [48]–[50]. Higher education institutions need to make strategic steps to build capabilities that enable universities to compete in facing competition [38]. Lecturers' concern for the Tri Dharma of higher education is one form of commitment to their profession. Professional commitment is shown by loyalty to their work. Lecturers will continue to strive to improve their performance, in this case the productivity of scientific works [39]. Professional commitment is an important factor in the sustainability of an institution. This shows how strong the commitment that lecturers have to higher education will improve their performance both in learning, behavior towards students, and other lecturers. Commitment also affects the productivity of lecturers in conducting research, writing scientific articles, and providing community service. The importance of interaction between lecturers in the campus environment is to be able to encourage the knowledge created to be maintained and sustainable [43], [51].

In increasing the productivity of scientific work, empowerment is related to academic culture [52]. Likewise with knowledge management, thus realizing a commitment to lecturers in improving the quality of themselves, study programs, and institutions by continuing to be productive in producing the

productivity of scientific works [46], [52]. The previous and relevant research has similarities in one of the variables, but different in the subject under study. However, it can be concluded that empowerment, academic culture, knowledge management, and professional commitment have an effect on the productivity of lecturers' scientific work.

4. CONCLUSION

Based on the results of research and discussion, it can be concluded that the productivity of lecturers' scientific work can be increased by strengthening the empowerment variables, academic culture, knowledge management, and professional commitment. The variables that have a positive effect on the productivity of lecturers' scientific work are empowerment, academic culture, knowledge management, and professional commitment. Quasi-qualitative research by interviewing informants at the research site provides information on the existence of variables that have a positive effect on the productivity of lecturers' scientific work. Path analysis is used to prove the existence of variables that have an influence on the productivity of lecturers' scientific work, which can be proven by using path analysis evidence. The variables that have a positive effect on the productivity of the lecturer's scientific work can increase the productivity of the lecturer's scientific work. Improvement of indicators that are still weak and maintain indicators that are already good is done by strengthening the variables that have a positive effect on the productivity of lecturers' scientific work.

Suggestions are given to higher education leaders that the productivity of lecturers' scientific work can be improved by strengthening empowerment, academic culture, and knowledge management. Therefore, higher education leaders need to empower lecturers through an academic culture and knowledge of management which is still weak and maintains good indicators. Suggestions are also given to lecturers that the productivity of lecturers' scientific work can be increased by strengthening professional commitment. Therefore, lecturers need to further increase their commitment to their profession, through improving indicators of professional commitment that are still weak and maintaining good indicators, namely consistency in carrying out tasks based on expertise. The limitations of previous research in the form of journal articles are a factor in the difficulty of completing this research. In addition, the strengthening, optimization, resource management modeling or POP-SDM model is a new research approach that needs to be continuously reviewed for further research.

REFERENCES

[1] R. Altunisik, "The Role of Lecturer Related Factors in Students' Perceptions and Satisfaction in Distance Education," *Procedia - Social and Behavioral Sciences*, vol. 106, pp. 3075–3083, Dec. 2013, doi: 10.1016/j.sbspro.2013.12.355.

[2] N. Pheeraphan, "Enhancement of the 21st Century Skills for Thai Higher Education by Integration of ICT in Classroom," *Procedia - Social and Behavioral Sciences*, vol. 103, pp. 365–373, Nov. 2013, doi: 10.1016/j.sbspro.2013.10.346.

[3] F. Barletta, G. Yoguel, M. Pereira, and S. Rodríguez, "Exploring scientific productivity and transfer activities: Evidence from Argentinean ICT research groups," *Research Policy*, vol. 46, no. 8, pp. 1361–1369, Oct. 2017, doi: 10.1016/j.respol.2017.05.007.

[4] H. Beazley, J. Boenisch, and D. Harden, "Continuity Management: Preserving Corporate Knowledge and Productivity When Employees Leave," *Work Study*, vol. 52, no. 3, Jun. 2003, doi: 10.1108/ws.2003.07952cae.003.

[5] M. Beerkens, "Facts and fads in academic research management: The effect of management practices on research productivity in Australia," *Research Policy*, vol. 42, no. 9, pp. 1679–1693, 2013, doi: 10.1016/j.respol.2013.07.014.

[6] A. Boediprasetya and N. J. Setiadi, "The effect of knowledge sharing between lecturers on lecturer research performance," (in Indonesian), *Sustainable Competitive Advantage (SCA) Proceeding Seminar*, 2014, pp. 146–156.

[7] P. Kwangmuang, S. Jarutkamolpong, W. Sangboonraung, and S. Daungtod, "The development of learning innovation to enhance higher order thinking skills for students in Thailand junior high schools," *Heliyon*, vol. 7, no. 6, Jun. 2021, doi: 10.1016/j.heliyon.2021.e07309.

[8] K. Detterbeck and M. Sciangula, "Innovation Through Collaboration: Using an Open-Source Learning Management System to Enhance Library Instruction and Student Learning," in *Distributed Learning: Pedagogy and Technology in Online Information Literacy Instruction*, Elsevier Inc., 2017, pp. 221–238. doi: 10.1016/B978-0-08-100598-9.00012-X.

[9] L. L. Byars and L. Rue, *Human Resource Management*. Boston: Irwin, 2000.

[10] R. Colby, "Writing and assessing procedural rhetoric in student-produced video games," *Computers and Composition*, vol. 31, no. 1, pp. 43–52, 2014, doi: 10.1016/j.compcom.2013.12.003.

[11] V. S. Conn, R. T. Porter, R. W. McDaniel, M. J. Rantz, and M. L. Maas, "Building research productivity in an academic setting," *Nursing Outlook*, vol. 53, no. 5, pp. 224–231, Sep. 2005, doi: 10.1016/j.outlook.2005.02.005.

[12] A. Falah and A. Parestya, "The effect of knowledge management on employee performance and company performance (Study on Employees of PT Semen Indonesia Persero Tbk)," (in Indonesian), *Jurnal Administrasi Bisnis (JAB)*, vol. 50, no. 4, pp. 192–198, 2017.

[13] H. G. Peter, "A problem-solving perspective on knowledge management practices," *Decision Support Systems*, vol. 31, no. 1, pp. 87–102, 2001.

[14] D. Grogan, V. Reddy, A. Gupta, Y. F. Chang, D. Fields, and N. Agarwal, "Trends in Academic Spine Neurosurgeon Productivity as Measured by the Relative Citation Ratio," *World Neurosurgery*, vol. 147, pp. e40–e46, Mar. 2021, doi: 10.1016/j.wneu.2020.11.097.

[15] B. Gustavii, *How to Write and Illustrate a Scientific Paper*. Cambridge University Press, 2017. doi: 10.1017/9781316650431.

[16] N. Hayati and L. Lolytasari, "Productivity of Uin Syarif Hidayatullah Jakarta lecturer in scopus indexed journals: a bibliometric study," (in Indonesian), *Maktabah Jurnal Komunakasi dan Informasi Perpustakaan*, vol. 16, no. 1, pp. 22–31, 2017, doi: 10.15408/almaktabah.v16i1.8084.
[17] H. Hermanto, "The Influence of Organizational Culture Types on The Behavior of Knowledge Sharing: A Conceptive Approach," (in Indonesian), *JMM UNRAM - Master of Management Journal*, vol. 7, no. 1, pp. 20–31, 2018, doi: 10.29303/jmm.v7i1.399.
[18] H. Hottenrott and C. Lawson, "Fishing for complementarities: Research grants and research productivity," *International Journal of Industrial Organization*, vol. 51, pp. 1–38, Mar. 2017, doi: 10.1016/j.ijindorg.2016.12.004.
[19] A. Husin, "The influence of knowledge management on lecturer empowerment: a case study of private higher education lecturers," (in Indonesian), *Operations Excellence: Journal of Applied Industrial Engineering*, vol. 9, no. 2, pp. 140–151, 2017, doi: https://dx.doi.org/10.22441/oe.
[20] N. Hussein, S. Omar, F. Noordin, and N. A. Ishak, "Learning Organization Culture, Organizational Performance and Organizational Innovativeness in a Public Institution of Higher Education in Malaysia: A Preliminary Study," *Procedia Economics and Finance*, vol. 37, pp. 512–519, 2016, doi: 10.1016/S2212-5671(16)30159-9.
[21] J. Israilidis, K. Odusanya, and M. U. Mazhar, "Exploring knowledge management perspectives in smart city research: A review and future research agenda," *International Journal of Information Management*, vol. 56, p. 101989, Feb. 2021, doi: 10.1016/j.ijinfomgt.2019.07.015.
[22] A. M. Körner, *Guide to Publishing a Scientific Paper*. Routledge, 2008. doi: 10.4324/9780203938751.
[23] S. Lee and B. Bozeman, "The impact of research collaboration on scientific productivity," *Social Studies of Science*, vol. 35, no. 5, pp. 673–702, Oct. 2005, doi: 10.1177/0306312705052359.
[24] L.-A. S. Milburn and R. D. Brown, "Research productivity and utilization in landscape architecture," *Landscape and Urban Planning*, vol. 147, pp. 71–77, Mar. 2016, doi: 10.1016/j.landurbplan.2015.11.005.
[25] J. B. Mondros and S. M. Wilson, "Organizing for power and empowerment," in *Empowering the powerless*, Columbia University Press, 1994.
[26] F. M. Nafukho, C. S. Wekullo, and M. H. Muyia, "Examining research productivity of faculty in selected leading public universities in Kenya," *International Journal of Educational Development*, vol. 66, pp. 44–51, Apr. 2019, doi: 10.1016/j.ijedudev.2019.01.005.
[27] N. Kosasih and S. Budiani, "The Effect of Knowledge Management on Employee Performance: A Case Study of The Surabaya Plaza Hotel Front Office Department," (in Indonesian), *Jurnal Manajemen Perhotelan*, vol. 3, no. 2, Jul. 2008, doi: 10.9744/jmp.3.2.80-88.
[28] National Research Council, *Improving Measurement of Productivity in Higher Education*. Washington, DC: National Academies Press, 2012. doi: 10.17226/13417.
[29] K. Nazari and M. Basami, "The Study of Relationship between Organizational Culture and Empowerment (Case Study in Private Banks in Kermanshah)," *Journal of Basic and Applied Scientific Research*, vol. 2, no. 4, pp. 3623–3630, 2012.
[30] N. D. Nguyen, T. D. Nguyen, and K. T. Dao, "Effects of institutional policies and characteristics on research productivity at Vietnam science and technology universities," *Heliyon*, vol. 7, no. 1, p. e06024, Jan. 2021, doi: 10.1016/j.heliyon.2021.e06024.
[31] G. Ninlawan, "Factors Which Affect Teachers' Professional Development in Teaching Innovation and Educational Technology in the 21st Century under the Bureau of Special Education, Office of the Basic Education Commission," *Procedia - Social and Behavioral Sciences*, vol. 197, pp. 1732–1735, Jul. 2015, doi: 10.1016/j.sbspro.2015.07.228.
[32] A. A. Nugroho, "The influence of knowledge management on the work productivity of production department employees at PT Gamatex Cimahi, Indonesian University of Education," (in Indonesian), Bachelor Thesis, Universitas Pendidikan Indonesia, 2015. [Online]. Available: http://repository.upi.edu/14483.
[33] L. P. Nygaard, and K. Bahgat, "What's in a number? How (and why) measuring research productivity in different ways changes the gender gap.," *Journal of English for Academic Purposes*, vol. 32, pp. 67–79, 2018.
[34] Organisation for Economic Cooperation and Development (OECD), *OECD Compendium of Productivity Indicators 2006*. OECD Publishing, Paris, 2016.
[35] S. H. Park, *Six Sigma for Quality and Productivity Promotion*. Tokyo: Asian Productivity Organization, 2003.
[36] H. Prabowo, "Knowledge management in Higher Education," (in Indonesian), *Binus Business Review*, vol. 1, no. 2, pp. 407–415, 2010.
[37] Salfadri, N. Begawati, and A. T. Andri, "The influence of leadership style and employee commitment to employee productivity in PT. Kunango Jantan," (in Indonesian), *INA-Rxiv Papers*, pp. 1–11, 2019.
[38] T. Sandjaya and R. D. Muliawan, "Productivity of Scientific Journal Article Writing Among Lecturers of the Faculty of Social and Political Sciences, Padjadjaran University," (in Indonesian), *Kandaga– Media Publikasi Ilmiah Jabatan Fungsional Tenaga Kependidikan*, vol. 1, no. 1, 2019, doi: 10.24198/kandaga.v1i1.20905.g11728.
[39] S. T. Sanmugam and N. Rajanthran, "Exploring Malaysian Polytechnic Lecturers' Perceptions towards Research: An Institutional Case Study," *Procedia - Social and Behavioral Sciences*, vol. 123, pp. 398–405, Mar. 2014, doi: 10.1016/j.sbspro.2014.01.1438.
[40] S. Hardhienata, "The development of scientific identification theory to conduct operation research in education management," *Journal of Physics: Conference Series*, vol. 755, no. 1, 2019, doi: 10.1088/1742-6596/755/1/011001.
[41] A. Saxena, "Workforce Diversity: A Key to Improve Productivity," *Procedia Economics and Finance*, vol. 11, pp. 76–85, 2014, doi: 10.1016/S2212-5671(14)00178-6.
[42] S. Hardhienata, "The development of scientific identification theory to conduct operation research in education management," *IOP Conference Series: Materials Science and Engineering*, vol. 166, no. 1, p. 012007, Jan. 2017, doi: 10.1088/1757-899X/166/1/012007.
[43] M. Wasahua, "Analysis of the Influence of Competence, Commitment and Motivation on the Performance of Lecturers of Private Higher Education Kopertis Region XII Maluku and North Maluku in Ambon City," (in Indonesian), *Soso-Q : Jurnal Manajemen*, vol. 6, no. 2, 2018, [Online]. Available: https://ojs.unpatti.ac.id/index.php/sosoq/article/view/761.
[44] M. Yamin, "Literacy policy to increase publication productivity in higher education," (in Indonesian), *JAS-PT Jurnal Analisis Sistem Pendidikan Tinggi*, vol. 2, no. 1, p. 19, 2018, doi: 10.36339/jaspt.v2i1.120.
[45] M. A. Ynalvez and W. M. Shrum, "Professional networks, scientific collaboration, and publication productivity in resource-constrained research institutions in a developing country," *Research Policy*, vol. 40, no. 2, pp. 204–216, 2011, doi: 10.1016/j.respol.2010.10.004.
[46] M. Sharifi, H. Farahani, F. Shahbazi, M. Sharifi, C. T. Kello, and M. Zare, "Multifractality and non-Gaussianity of eye fixation duration time series in reading Persian texts," *Physica A: Statistical Mechanics and its Applications*, vol. 514, pp. 549–562, Jan. 2019, doi: 10.1016/j.physa.2018.09.106.

[47] N. N. Beni, "Analyzing the Mediating Role of Organizational Innovation on the relationship between Knowledge Management and Organizational Entrepreneurship," *International Journal of Human Resource Studies*, vol. 6, no. 4, p. 34, 2016, doi: 10.5296/ijhrs.v6i4.10335.
[48] I. R. I. Simanjuntak, "The Effect of Organizational Culture and Employee Empowerment on Employee Performance (Case Study at PT. Pos Indonesia, Central Jakarta)," (in Indonesian), Bachelor Thesis, Universitas Mercu Buana, 2017. [Online]. Available: https://repository.mercubuana.ac.id/33118.
[49] A. J. Parker, T. J. Slattery, and J. A. Kirkby, "Return-sweep saccades during reading in adults and children," *Vision Research*, vol. 155, pp. 35–43, Feb. 2019, doi: 10.1016/j.visres.2018.12.007.
[50] H. L. Hsieh, J. R. Hsieh, and I. L. Wang, "Linking personality and innovation: The role of knowledge management," *World Transactions on Engineering and Technology Education*, vol. 9, no. 1, pp. 38–44, 2011.
[51] S. Q. Qu and J. Dumay, "The qualitative research interview," *Qualitative Research in Accounting & Management*, vol. 8, no. 3, pp. 238–264, Aug. 2011, doi: 10.1108/11766091111162070.
[52] J. A. Maxwell and L. E. Reybold, "Qualitative Research," in *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, Elsevier, 2015, pp. 685–689. doi: 10.1016/B978-0-08-097086-8.10558-6.

BIOGRAPHIES OF AUTHORS

Lina Novita is a lecturer at the Faculty of Teacher Training and Education at Pakuan University with specifications for educational management and research methodology. Completed the Doctoral Program in Education Management at Pakuan University in 2021. Member of Lecturer of the Republic of Indonesia (2020-present). Previously served as Head of the FKIP Computer Laboratory, Assistant for the PGSD Study Program, and the Quality Assurance Unit for the Graduate Education Management Study Program at Pakuan University. She can be contacted at email: linovtaz@gmail.com.

Elly Sukmanasa is a lecturer at the Faculty of Teacher Training and Education at Pakuan University with specifications for education management and Introduction to Education for Children with Special Needs. Completed the Doctoral Program in Education Management at Pakuan University in 2021. Member of the Lecturer of the Republic of Indonesia (2020-present) and the Association of PGSD Lecturers. Served as Head of the Primary School Teacher Education (PGSD) study program from 2011 to present. Became Chief Editor at the accredited JPPGuseda journal Sinta 4 in 2017-2022 and Editor at the journal JPPGuseda from 2022-present. She can be contacted at: sukmanasaelly@gmail.com.

Eka Suhardi is the Dean of the Faculty of Teacher Training and Education at Pakuan University with specifications for education management and Research Methodology. Completed the Doctoral Program in Education Management at the State University of Jakarta. Previously served as Head of the Biology Laboratory of FKIP, Secretary of the Biology Education Study Program FKIP, Head of FKIP Biology Education Study Program, Deputy Director for Academic Affairs PPs, Vice Chancellor for Academic and Student Affairs, and Dean of FKIP UNPAK in 2021-present. He can be contacted at: ekasuhardi@unpak.ac.id.

Suhendra is a lecturer at the Faculty of Teacher Training and Education at Pakuan University with specifications for education management and Education Quality Assurance. Completed the Doctoral Program in Education Management at Pakuan University in 2021. Member of Lecturer of the Republic of Indonesia (2020-present) and Association of Education Management/Administration Study Programs. Served as Chair of the Indonesian Language and Literature Education study program in 2010-2020. Education Management Quality Assurance 2021-2022, Secretary of the Education Management Study Program 2021-present. He can be contacted at email: suhendra@unpak.ac.id.