# The Implementation of Research Management in Vocational Higher Education: A Review at Politeknik Negeri Bandung

**Carolina Lasambouw, Ediana Sutjiredjeki, and Neneng Nuryati**
"Bandung State Polytechnic"
Jalan Gegerkalong Hilir, Desa Ciwaruga, 40012 Bandung, Indonesia
e_sutjiredjeki@yahoo.com, lcarolina04@yahoo.com

**Abstract**

Quality research process will produced quality research products. In order to achieve excellent research results, university need to have good research management. Research Management describes the management with the contents of various research activities and the aspects are quite complex. Research portfolio development and management is not an easy thing, both for researchers individually and for institutions of higher education. It does cover the whole aspects of holistic research management.

This paper attempt to describes the results of a qualitative study on *Research Management* in Polytechnics as vocational higher education and the efforts that have been made by the institution to overcome the arise problems.

*Key words: Research management, vocational higher education, implementation*

**Introduction**

The attention of the Indonesian university, government as well as the public toward the issue of the low quantity and quality of scientific publication produced by academics in the universities has increase in 2017. This issue even warmer when associated with a rational for linking the productivity in publishing scientific paper with funding received by the lecturers or professors. Bearing in mind that discovery, dissemination and application of the new sciences is at the core of the provision of education in universities, therefore university was expected to produce good quality of scientific publication. And it can only be produced from quality research process.

Formerly, the search of science or innovative product conducted through research is an attempt to find answers to the questions post by the researcher/s, and researchers will feel satisfied with obtaining answer from research. Especially if the answer is in accordance with the criterion of truth of the researchers (Satori and Komariah, 2011, p. 20). Nowadays, research's products become an important aspect to establish the reputation of the university and it gradually evolved into the basis for measuring the success of its academic administration and financial management (Tacey, 2009). In this regards, focus of conducting research is not intended merely to satisfy the desire of the researcher alone.

Furthermore, research splits knowledge into disciplines and fields/programs that provide a deeper understanding in an increasingly complex world. However, in its development, there is an increasing understanding that the problems faced in the 21st century require *a holistic* understanding of knowledge in its various aspects (Gibb, 2009). This makes increasingly necessary for the research to be associated with the needs of the society, and this appears as a paradigm on the policy in higher education that "the result of research need to contribute to improving the welfare of society and the nation's economy" (MOHE, 2017). Herein, research activities should be viewed as an investment, so that the results of the implementation of research activities should be optimal utilized.

This paper attempt to describes the results of a qualitative study on *Research Management* in Polytechnics as vocational higher education and the efforts that have been made by the institution to overcome the arise problems.

**Condition of Research in Polytechnic**

Politeknik Negeri Bandung (POLBAN) is one of the largest vocational higher education in Indonesia. Currently it has 10 departments that administer 41 study programs, and supported by 497 permanent lecturers. In the age of more than 30 years, POLBAN has contributed considerably to improve national competitiveness, especially in the field of providing skillful human resources for the industry or public institutions through the graduates. In addition, POLBAN is also expected to contribute in other areas such as provide support for increasing industrial competitiveness, strengthening small-scale industries and medium enterprises, solving existing problems in the community, developing science and technology including its application. Usually, the contribution done through conducting joint research, and dissemination of research products conducted by POLBAN's for the industries or the community.

Currently, the potential to optimize the utilization of innovation products produced through research are high. This is due to the large number of products resulted from the academician research. As most of the researchs are applied research, so the nature of products resulted from the research activities tend to be applied products. Figure 1 below shows the growth of research activities in POLBAN for the last six (6) years (2011-2016).

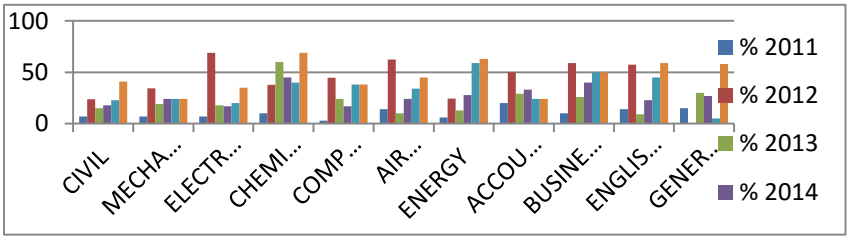


*Figure 1 Growth of Research in POLBAN Year 2011-2016*

As can be seen in figure 1, in average the number of research conducted by the lecturers was increased every year. For the last six years approximately 986 research's titles have been conducted. While the numbers of lecturer involved in the research activities each year arround 199. However, the involvement of the lecturer in research activity can be said low compare to the total number of lecturers which is 495. This means there is wide opportunity to increase the lecturer capacity in conducting good research.

Another problem is related to the utilization of the research's products. In general the products of the research is still stored in the form of reports, prototypes, scientific publications or untested concepts. This situation shows that the research's products have not optimal utilized by the industry or by the general public to the fullest. Bearing in mind that an innovation is considered successful when it can be utilized such as by commercialized (Jobber.D, 2001), so it is urgent to promtly improve the condition.

**3. Role of *Research Management***

Literture review on research management's topic in Indonesia is rare. There are three relevant Articles could be found. One was written by Purwo Santosa (2006, p.1) who describes the *lessons learned* of research management at Gajah Mada University. It confirms on *'the ability of* Gajah Mada University *in boosting its research capacity relies on its ability to bring together a sense of well-managed autonomous institution and atmosphere'.* The second articles from Sutjiredjeki et al (2011) which explain the function of research management unit in supporting research dissemination in polytechnic. And the third article is exploring Research Management aspects, their function and linking (Lasambouw, 2015). The articles discussed general aspect of research management in university.

On the contrary, several research management reviews undertaken in the past by overseas institutions. They showed that the scientific focus of the researchers tend to address the research activities in Research University environment (Welker and Cox 2006; Beerkens 2008; RUFC 2012) as well as commercialization of research products' (Greenberg, 2007). The two topics which become the focus of those researchers tend to be addressed

towards researches conducted in research universities which definitely have already acquire power in producing good-quality researches as the fundamental characteristics of researches universities. In his article, The New Production*: The Dynamic of Science and Research,* Gibson et al (2009) discussed the aspects which contribute in shaping researches' management, mission and role. Mark E.Welker & Alan R. Cox research (2006) confirms that both research and mission of institutions are equally important. They found that 75% of researched institutions publicized researches activities, funding and researches results regularly through various media. 50% from the institution researched play a significant role in economic development. While British Council (2012) in a report entitled *The shape of things to come: Higher Education Emerging Global Trends and Opportunities to 2020* describes one of the trends of higher education in the global era is the importance of international collaboration in research activities.

In other article, *Professionalizing Research Management,* John Green and David Langley (2009) confirms that research management function requires a certain set of skills and knowledge which universities need to have. According to them, universities have to develop their research strategy and assign academic and administration leaders to support research management.

**4. Aspects of Research Management**

Research Management describes the management with the contents of various research activities and the aspects are quite complex. In the opinion of Tacey (2009), and Green and Langley (2010) research portfolio development and management is not an easy thing, both for researchers individually and for institutions of higher education.

Research management does not only include the selection of individuals who will be assigned to manage research activities or efforts to improve the capacity of staff related to research management in the university environment in order to be able to manage optimally and professionally, but cover the whole aspects of holistic research management. As recognized by Connell (2004) that *"The growth of research management as a company is specialized and professional field of activity over the past decade has been striking".* This is reinforced by the findings of Purwo Santosa (2007, p .1) that: *"Anyone attempt to Enhance research capacity would have to encounter with the external environment, structural factor of the which serves as hardware and cultural factors roomates serve as software for allowing the research community engage in a political dynamics* ". Referring to Connell and Santosa's description, it can be concluded that there are three factors related to strengthening the ability of universities to manage research. Two factors relating to internal university matters: they are factor related to structure of the organization as a *hardware* and factors related to organizational culture as *software*. The third factor is the factors relating to the external environment of the university.

Santoso's opinion on these three factors is in line with Green and Langley (2010) research results on research governance. They suggests that the process of conducting research governance manifested in the form a diverse set of activities undertaken by the research manager. Furthermore, Green and Langley referring to the results *of The Scottish University Research Policy Consortium* (1999) identifies thirteen (13) elements of governance of research as follows:

**Table 1 Elements of *Research Management***

| **Research Management Element** | **Task / Activity** |
|---|---|
| 1. Institutional research strategy. | Refer to the strategic plan of the University to strengthen their research function. |
| 2. Collaboration. | Addresses the need of institutions to share research resources to complement each other's strength and minimize weaknesses. |
| 3. Accountability and research. | Establishes the delegation of responsibility of any research activity. |
| 4. Funding issues. | Tackles how the institution divides its financial resources into two major dichotomies - teaching and research. |
| 5. Teaching and research. | Communicates how both functions complement and support each other, and how academic personnel can be rewarded for being able to |

| Research Management Element | Task / Activity |
|---|---|
| | perform both functions. |
| 6. Staff policy and research training. | Refers to what the training capabilities of its academic personnel are. |
| 7. Post-graduate and research | Recommends how post-graduate students can be trained to fully maximize the research capabilities. |
| 8. Scientific integrity. | Establishes what is the nature of scientific misconduct is. |
| 9. Publication and research ethics. | Discuss what areas to be addressed in the publishing of research outputs and the importance of the code of ethics to guide research practice. |
| 10. Academic freedom and research. | Discuss nature of academic freedom and its vital role in creating a research culture. |
| 11. Protection and commercialization of research. | Explains the importance of upholding intellectual property rights and the need to promote research outputs beyond the University. |
| 12. Risk management. | Addresses what factors can slow down, degrade, or totally inhibit research outputs. |
| 13. Publicity and promotion of research. | Addresses the need of the University to inform the public and private advertise its research potential. |

Governance-related elements of the study, Bernardo (2010, p. 6) states that *"the above listing is prescriptive of good research management practice".* Comparing with the rules in force in Indonesia, the elements of governance studies in line with the current policy of the Ministry of Research, Technology and Higher Education (Kemenristekdikti) on Higher Education National Standard as outlined in the Handbook of Research Edition year 2017, including arrangements regarding eight research standards to be met by each university within the management of research, namely (1) the standard of research results; (2) study on the content standards; (3) standard for research process; (4) research assessment standard; (5) Standard of the researcher; (6) standard of research facilities; (7) the standard of research management; and (8) standard of research funding.

## 5. Research Management Model

In order to overcome problems such as lack of involvement of the lecturer in conducting good research activity, low number of publications, under utilization of research results and so forth, polytechnic need to find ways for solving those problems such as through optimalize research management functions.

The findings of qualitative research conducted in 2015 in three (3) Polytechnics showed 12 out of 13 elements of research management have been applied by the management of research at the polytechnic. However, the application tends to be partial or performed by each division/unit in silos and separate. Elements that have not been the focus of concern is *risk management.* Furthermore, In order for research management to perform optimum it needs to have a good direction, so that all elements can be synchronized implemented and in an integrated manner. Model for integrating elements of research management can be seen in Figure 2 below (Lasambouw, 2015). It is expected that the research managers in polytechnics, as well as in university in general, will use it for consideration.

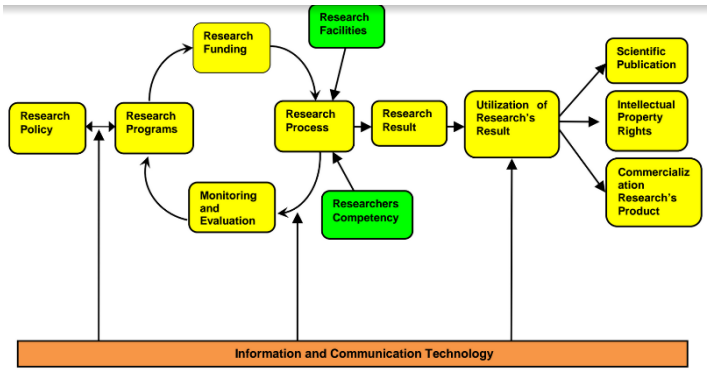


Figure 2 Integrated Research Management Model in Polytechnic, Indonesia (Lasambouw et al, 2015)

The research management system used by the polytechnic should be packed in such way that the research process undertaken by the lecturer is consistent with the research strategy set by the institution. Bring together individual research's passion and institutional vision is a challenge for the research managers.

The essence of Figure 2 is the integration of the whole elements in the process of conducting research in polytechnic, which is described as a large box that frames all research management components. **The first aspect is strategy.** Realizing the term strategy tends to be abstract, it needs to be realized in the form of programs that have clear objectives and can be implemented at the operational level. However, it is realized that translating strategy into a practical operation is not easy (Amstrong, 2006, p.23). The terminology of the basic strategy of research management is not expected to be simply as basic strategy for research planning or a set of policy designed to smooth the process of research activities. There are six (6) strategies proposed to be considered for strengthening research management in polytechnic. They are:

a) strategy for optimizing the core research direction in the institution.

The strategy used by Bandung State Polytechnic is through the provision of a Research Master Plan which contains the direction of research development plan and research activity which is inline with the institute's vision.

In line with the Master Plan, the research management leader develop Institution Research Road Map which is build with two approachs: bottom up and top down.

The two main documents provide as the basis for policy making in developing research capacity of the individual lecturer as well as supporting the goals of the institution.

b) research funding strategy. Funding play an important role in supporting research activities. Beside rely on funding from the central or local government, every year Polytechnic internally provide research budget to support the researchers who do not granted funding from government. The research fund provided by internal Polytechnic is used as a "bridge" to improve lecturer's ability in conducting research. It is expected that when their research ability increased, the lecturer will able to develop good proposal for winning research grant provided by the government.

c) strategy of optimalize of the research implementation process. The process of conducting research is done based on the standards operating procedures that has been made in line with the Research Master Plan.

d) strategy of optimizing research resources. For researcher capacity building purpose, research manager in Polytechnic has developing researcher competency standard. However, other resources to support POLBAN's lecturer conducting research tend to be limited. Resources such as laboratorium is provided only for students. Therefore researcher need to find their own way to obtain necessary source to support their research.

e) optimizing strategy for utilization of products resulted from research. The utilization of research product has not been optimal yet. This is due to the cycle of the research process tend to end when the researcher submitted

their research report. In the future, a mechanism to obtain, inventory, and further processing the products of research must be developed. Furthermore, the increase of research products' results may lead the research manager to develop a mechanism for optimizing the utilization. Consideration needs to set toward the increase of research products which tend to lead toward commercialization.

f) strategy for research's knowledge management. Knowledge management of research results is manage in the form of Research Repository dan Data Base of Research. In the future this source need to continously improved and utilized.

g) strategy for continuous improvement. Continous improvement in research management has not been implemented optimally. This is because the number of human resources that handle the research activities is very limited. The implication is that improvement focus more to routine activities. In the future, a more sustainable and holistic improvement mechanism should be inplaced.

Second important aspect is the core of research flow as showed by the four interrelated elements at a basic individual research cycle. They are: a) the research programs; b) research funding; c) implementation of process; and d) monitoring and evaluation. It is emphasized that the performance of the four components is mutually constructive and complementary to generate research outcomes in the direction set in the policy. The other three components, namely research support facilities, researchers competent, as well as information and communication technology become an important supporting components to realize innovation and creativity as the output of quality research. Results of the research are realized in various forms of products which will need to be sorted out into three groups: a) scientific articles publish in local/national/international journals, registered intellectual property assets, or product for commercialized.

**Closing Remarks**

Research management becomes increasingly important to implement. Sadly, attention to this issue is stiil at the minimal level. Whereas good and quality of research management can contribute to the improvement of the quality and quantity of research.

The propose model of research management has considered the holistic elements and an integrated approach.

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