

## **Analysis of Optimizing Factors for Utilization of Research Results in Health College**

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### **Abstract**

Weak utilization of research results for economic and social development in society as well as the competitiveness of technological products produced by universities encourage the need for factor analysis in optimizing research results that can bridge the solution to this problem. This research uses quantitative descriptive methods to identify and analyze factors that are considered variables to obtain an effective research process so that it can be utilized by users in the form of downstream research results. The results of the field study show several factors that influence the mechanism, including the importance of having a research road map that links and matches not only from a scientific perspective but also with industry through technology and market readiness. Scientific interdisciplinary collaboration and the role of intermediation and incubation are needed for its optimization supported by appropriate regulations. Potential research must be strengthened into research that produces high-value-added products, both economically and socially, capable of transforming into products that have competitive and comparative advantages and provide solutions for users.

**Keywords:** optimizing utilization, downstream research results

### **1. Introduction**

#### *Introduce the Problem*

The weak competitiveness of technological products produced by government R&D institutions and universities is currently still a chore. This is partly because the ability of innovation in Indonesia is still very dependent on the adoption and adaptation of imported technology. Increasing the utilization of research results that are utilized is a government priority. The Ministry of Research, Technology and Higher Education aims to downstream and commercialize research results through industry so that they can be used directly for the community because so far there have been many results. The resulting research is only to decorate library cabinets.

In the context of downstream, the problem is not only technology transfer but how the results can boost national economic growth so that it has a broad impact. This requires a comprehensive effort in developing the downstream and commercialization of a technological product, not only the task of the central government but also the regional government and a shared task, both R&D institutions, and also the industry in building understanding.

Downstream and commercialization is not something new in the world of research in Indonesia, it has been done in various ways for a long time. There have also been many research support financing schemes at the Ministry of Research and Technology when it was not yet incorporated into higher education, not to mention from the side of universities. There have also been many financing schemes, starting from financing basic research, applied to development and innovation, making rides such as the Science Technopark, and many more, but it is still felt that it is not enough to answer the growing problems.

Universities need to transfer scientific knowledge to the public, especially knowledge in important fields, such as health, education, economic development, and various technological applications, as well as topics that are currently developing rapidly. Likewise, universities have the responsibility to educate various types of vocational and professional skills needed by the community to increase the nation's competitiveness. And this requires identification and analysis of the factors that play a role in encouraging the acceleration of the utilization of research results to become more beneficial for the social and economic development of the community.

#### *Explore the Importance of the Problem*

The opportunity to utilize and develop university research results in the field of health studies is very large. But unfortunately, the process is not optimal because it is constrained by the lack of creative power and innovation carried out by students and other academics. The research results of students and lecturers have not been fully utilized by the general public through entrepreneurial activities.

The role of universities has traditionally had three core roles (Fauzy, 2019). First, teach the knowledge and skills needed in various aspects of development. This includes critical thinking skills and basic skills (soft skills). Second, generating new knowledge through the research process to develop science or create innovations in various aspects of life. Third, universities are also required to contribute to the creation of knowledge for evidence-based public policy-making.

In current practice, the role of universities is still very limited to teaching students and research to produce scientific publications in national or international journals. Meanwhile, the results of the research are still not optimal as a source of data, information, and knowledge in the process of making public policies. One indication of the cause of the limited use of research results in universities for public policy making is the lack of linkage between research themes on campus and various development priorities and government policies and community needs. (Banda et al. 2018)

This research aims to analyze the factors that play a role in optimizing the use of research results in health universities that can be used as a basis and consider the application and use for social and economic development in society (Knowledge/research-based society and economics).

#### *Describe Relevant Scholarship*

The Government of Indonesia, through the Ministry of Research and Higher Education, has established the National Research Master Plan (RIRN) for 2017-2045. RIRN is structured to

align long-term research needs with national development directions related to science and technology. The current research paradigm is output-based research, namely research that produces products that can be enjoyed by the public. Research results don't just stop being reported, published, and patented. However, it must become a product that can be commercialized for the welfare of society. It is hoped that the research results can directly touch the layers of society (Daulay, 2018). For this reason, it is necessary to downstream research results, namely the implementation of research methods and results in various fields so that the community can also enjoy them. Downstream is also carried out with the target of the business world and the industrial world through the implementation of the findings which can be in the form of appropriate methods and technologies. Downstream activities are also expected to lead to the commercialization of research results, namely efforts to provide commercial (economic) value for research findings.

The utilization of competitive research grants should encourage collaboration between universities, government, research institutions, and business entities. At this stage, universities must have breakthroughs to be more flexible in building relationships among various stakeholders to facilitate the creation of knowledge on campus, community, and in the public sector. (Yuliani, 2019).

Many people see that universities and industries seem to be running according to their respective tracks, not intersecting each other and not benefiting from each other. If this continues, however much the government allocates funds for research and development of science and technology, there will be no benefit for industry and society. The benefits are only for science such as publishing journals, exposure materials, and laboratory prototypes which are ultimately only stored in research rooms of universities and R&D institutions.

E. Petrova (2014) conveys that “Continuous innovation is one of the pharmaceutical industry’s most defining characteristics. New medications can be crucial for maintaining the quality of human life, and may even affect its duration. Drug innovation as a business process requires savvy strategic, organizational, and managerial decisions. It is already enjoying intensive research coverage, giving rise to abundant but relatively dispersed knowledge of the mechanisms driving drug discovery and development. As a guide to future research, critical drivers and modes for drug innovation are systematized in a unifying framework of characteristics and process decisions, and multiple areas in need of further scrutiny, analysis, and optimization are suggested”

Many obstacles occur in the downstream of science and technology products to enter into economies of scale, but there are at least 3 (three) fundamental problems that are the main factors hampering the down streaming of research results from universities or R&D institutions to industry, namely:

(1) Weak level of technology readiness (Technology Readiness Level-TRL).

Technology Readiness Level is a measure to determine indicators that show how ready or mature technology can be applied and adopted by users/prospective users (Menristekdikti, 2016). Technology Readiness Level is a systematic measurement system that supports the assessment of maturity or readiness of a particular technology and comparison of maturity or

readiness between different types of technology. A low level of technological readiness is a technology that is not yet feasible to be launched to the market, usually still in the form of a laboratory prototype, has not been tested, and cannot be seen for its reliability. Technology with a high level of readiness is a technology that has been proven, has undergone, and passed various technical tests both at the laboratory level and actual field tests.

(2) Low level of innovation readiness (Innovation Readiness Level-IRL)

Besides technology, there are 4 (four) important factors that must be considered so that a science and technology product can be utilized by industry and society, namely:

- (a) Ease of reaching the market. Science and technology products that can be marketed are products that are needed by the community, have good quality, relatively cheap prices, and are easy to obtain. No matter how great the product is created, it will not mean much if it is not needed by the community. The product will be useless and stall.
- (b) The form of organization used. It must be understood that the organization is an important factor in carrying out governance, dividing the work and functions, and duties of the company so that it can move more effectively and efficiently.
- (c) Developing partnerships. The partnership is an inseparable part of the strategy to deliver science and technology products to the market, without cooperation, science and technology products can experience various obstacles. Building partnerships with various institutions will increase efficiency and reduce unnecessary costs.
- (d) Mapping risk factors. It must be understood that all efforts carried out carry risks, of course with different levels, both in terms of capital, governance, resources, and institutions. In this case, the entrepreneur must be able to take into account that risk can be minimized so that it is at the lowest level.

(3) Lack of manufacturing readiness (Manufacturing Readiness Level-MRL)

Competitiveness has become a key factor in winning Indonesia's role in the MEA era, while high competitiveness is obtained from the relevance and productivity of research conducted by universities and R&D institutions, therefore we need to increase the productivity of research results to the industrial level into useful goods and services. economically.

*State Hypotheses and Their Correspondence to Research Design*

Potential research must be strengthened into research that produces products that have added value, both economically and socially. Higher education research must be able to transform into products that have competitive and comparative advantages and provide solutions for users.

**2. Method**

The description of the research activities carried out by lecturers at the Health College and the factors that play a role in the optimal utilization of research results in the community become the focus of the research carried out. This is the basis for determining the research approach used, namely a quantitative descriptive research approach. This research examines the form of activity,

its characteristics, changes, relationships, similarities, and differences with other phenomena. Quantitative descriptive research uses size, number, or frequency (Syaodih, 2012).

The method used is a survey design to describe quantitatively the tendencies, behaviors, or opinions of a population by examining a sample of the population (Creswell, 2009).

In this study, the researcher did not manipulate or give certain treatments to the variables and respondents or design something that was expected to happen to the variable. All activities, circumstances, events, aspects, components, or variables run as they are.

Data was collected through the distribution of questionnaires, observations, interviews, and literature review. After the data is collected, data analysis is carried out using descriptive statistics, by describing or describing the data that has been collected as it is (Sugiyono, 2012)

### **3. Results**

#### *Recruitment*

The location of the research was in a health college, with a population of 179 respondents who were lecturers and researchers. the number of samples in data collection was as many as 79 respondents consisting of lecturers from the faculty of pharmacy, the faculty of health sciences, and the faculty of nursing at the institution.

The data collection process in this research has been carried out since 2021 through literature and document studies, field observations, and also interviews with lecturers in each study program under the three faculties of Health, namely the pharmacy faculty, health science faculty, and nursing faculty. The study was conducted with a focus on exploring the picture of research activities and optimal utilization of the research results that have been carried out by lecturers since 2019.

One of the demands for the success of a university at this time is not only to focus on the learning process, but also on research whose results can be used to develop social and economic development in the community through the transfer of knowledge, technology, and innovation that is useful and has added value.

#### *Statistics and Data Analysis*

One of the weaknesses of research conducted by domestic researchers is that their research results cannot reach the stage of commercialization. Downstream needs to be continuously encouraged so that the results of the research can be felt by the community. Several factors play a role in it, including the factor of the researcher himself in planning and carrying out his research activities (grand design), the availability of a clear, focused, and consistent research roadmap, and considering its relationship with research results that link and match with the world. industry and society

The following are the results and data analysis of these factors:

Table 1. Availability and consistency of research roadmap and industry link and match

No.	Variable Aspect	Response	amount respondent	percentage	total respondent
1	grand strategy	Identified	24	30,4	79
		Documented	21	26,6	79
		not available	34	43	79
		Individual	39	49,4	79
2	Research road map	Science	14	17,7	79
		knowledge field	29	36,7	79
		not available	6	7,6	79
		roadmap research	47	59,5	79
3	consistency of theme and research focus	student research	23	29,1	79
		team research	13	16,5	79
		sponsor research	7	8,9	79
		Inconsistent	13	16,5	79
4	Link and match industry needs and research focus	Identified	19	24,1	79
		not identified	60	75,9	79

Grand research strategies are the main points of research strategies that become the basis, reference, and approach in the context of achieving strategic goals and/or improving the strategic position of research. Based on the data above, it can be seen that most lecturers and scientific fields still do not have a documented grand research strategy.

A research roadmap is a roadmap that makes a plan for the direction of research activities carried out, either by the lecturers themselves or their scientific fields. Based on the data above, it can be seen that there are still relatively few lecturers and scientific fields that have a research roadmap, both documented and undocumented.

Consistency of themes and research focus is also still an obstacle. The data shows that most of the lecturers have not followed their research roadmap.

In the aspect of identifying the need for link and match between the research and industrial needs, the data shows that most researchers or lecturers have not identified this. research is still carried out by internal interests only.

The next thing that becomes the study of data analysis research is the level of technology and innovation readiness factors from research results, as well as the collaboration process carried out, both within the Health scientific disciplines and across disciplines as well as the availability of appropriate collaboration platforms.

The data and analysis results can be seen in the following table:

Table 2. Research collaboration and technology innovation readiness

No.	Variable Aspect	Response	amount respondent	percentage	total respondent
1	Research is carried out through interdisciplinary collaborations	Ya	35	44,3	79
		No	44	55,7	79
2	a special forum for collaboration for researchers who have the same research topic	Available	35	44,3	79
		Not available	44	55,7	79
3	Research potential for technology readiness	High	3	3,8	79
		Currently	27	34,2	79
		Low	15	19	79
		don't know	34	43	79
4	Innovation readiness potential	High	3	3,8	79
		Currently	29	36,7	79
		Low	15	19	79
		don't know	32	40.5	79

Some of the above are factors that play a role in optimizing the use of research results on the side of the researcher. The data shows that most researchers or lecturers still have not collaborated with scientific interdisciplinary which can encourage the addition of value from research results in several angles of study. There are still many institutions to accommodate it that are not yet available. Meanwhile, a lot of research has been carried out, the results of which do not have the potential to have a level of technological readiness, innovation, and market readiness that is ready to be commercialized.

Meanwhile, things outside of researchers that often affect their success include institutional policies and regulations related to research directions, resources, research network funds; research facilities, and infrastructure for development; the role of business incubators and production laboratories; the role of institutional intermediation to bring together academics, government, and industry; user mindset to take advantage of domestic research results; clarity of information on the rules of the game for submitting research results for the downstream industry, including research reporting and administration.

The following is data from research related to these factors.

Table 3. other factors that play a role in optimizing the use of research results

No.	Variable Aspect	Response	amount respondent	percentage	total respondent
1	institutional policies: research regulations to enter the industry, research funds, research directions, resources, research networks	Clear	31	39,2	79
		Unclear	45	57	79
		Unclear	3	3,8	79
2	Research facilities and infrastructure for the development of innovation	Adequate	10	13,9	79
		Enough	45	56,7	79
		Inadequate	24	30,4	79
3	The role of business incubators and production laboratories	Good	2	2,5	79
		Enough	27	34,2	79
		not enough	50	63,3	79
4	the role of institutions in intermediary is to bring together academics - government - business in the form of operational cooperation with real, useful, and sustainable innovations.	Adequate	7	8,9	79
		Enough	28	35,4	79
		Inadequate	44	55,7	79
5	user mindset to take advantage of domestic research results	Good	10	12,7	79
		Enough	38	48,1	79
		not enough	31	39,2	79
6	clarity of information on the rules of the game for submitting research results for downstream industries	Clear	4	5,1	79
		Enough	29	36,7	79
		not enough	46	58,2	79
7	research administration and reporting system	make it easy	18	22,8	79
		Enough	57	72,2	79
		Bother	4	5	79

The data shows that institutional policies and regulations related to research directions, resources, research network funding; research facilities, and infrastructure for development; the role of business incubators and production laboratories; the role of institutional intermediation to bring together academics, government, and industry; user mindset to take advantage of domestic research results; the clarity of information on the rules of the game for submitting research



results to downstream industries, including reporting and research administration is still inadequate and supports very well.

The role of intermediation is needed to bring together Academician-Business-Government in the form of operational cooperation with real, useful, and sustainable innovations that require support in the form of institutional policies, while the rules for submitting research results for downstream industries are still not clear enough with information and policies.

#### **4. Discussion**

The development and competitiveness of a nation can be seen through the form of research in the form of increasing the ability of science and technology as well as innovation that has a contributed to strengthening the economy with the large adoption of research technology by industry and society.

So far, research produced by universities, including health universities, is only stored and enjoyed by certain circles, still far from being used by the community.

The results of research conducted by many researchers have not yet reached the stage of commercialization, which is one of the weaknesses in current research. so it is necessary to encourage downstream programs with appropriate regulations.

The Downstream in question is the implementation of research methods in various ways so that the community can also enjoy the results. For example, benefit-oriented research or research that can be applied in the industrial world.

Research results that can be downstream are research that can meet the value of the level of technology readiness (technology readiness level), namely the level of maturity conditions or the readiness of the results of research and development of certain technologies that are measured systematically so that they can be adopted by users, both government, industry and other communities as well as the level of market readiness (permenristekdikti, 2016),

Market Readiness' is being ready to go to market with useful, useable, and used outputs (Cloudwatch, 2017). This shows that the research must be useful, useable, and used outputs for any market – the business world, the industrial world, the business world, government, and society.

Research cannot be directly used by the community. Downstream technology and innovation require processes and models that are sought, including the intermediation model which is often called incubation, namely the maturation process of technology results so that technology can be utilized by the community and can be used for added value.

Intermediation is needed to bring together Academician-Business-Government in the form of operational cooperation with real, useful, and sustainable innovations and the role of business incubation so that its scope rises to an industrial scale.

The downstream of technological research results towards commercialization will produce many benefits that can be felt, including the emergence of new products, which will increase industrial productivity and can create new jobs with higher added value as the basis for economic growth.

Potential research must be strengthened into research that produces products that have added value, both economically and socially. Higher education research must be able to transform into products that have competitive and comparative advantages and provide solutions for users.

Universities also need to improve campus management and the ability to seek creative funding, which is useful for supporting the implementation of new research that has an impact on solutions for the community.

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