ISSN:1533-9211
SEYBOLD REPORT
www.seybold-report.com

THE CHALLENGE OF INNOVATION MANAGEMENT MODEL FOR HIGHER EDUCATION IN INDUSTRIAL REVOLUTION ERA 4.0

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ISSN:1533-9211
SEYBOLD REPORT
www.seybold-report.com

ISSN: 1533 - 9211

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KEYWORDS:

Innovation, Management, Higher Education

Received: 18 August 2023
Accepted: 14 September 2023
Published: 23 September 2023

TO CITE THIS ARTICLE:

Nur Aedi (2023). The Challenge of Innovation Management Model For Higher Education In Industrial Revolution Era 4.0. *Seybold Report Journal*, *18*(07), 172-190. https://doi-ojs.org/10-5110-77-9129/

Abstract

The current orientation of higher education human resource development should have led to the fulfillment of competencies that are in accordance with the needs of the labor market, therefore higher education quality goals are absolutely necessary, and one of them is done through strengthening competence and higher education innovation, especially facing the industrial era 4.0. This research was conducted by conducting observations and interviews with higher education managers, and providing a questionnaire through a google form filled out by 100 higher education managers to look for obstacles and aspects that have not been touched to be developed in their higher education management. The research findings state that the management innovation steps at the faculty of education at the university have not fully touched several aspects such as legality, quality management, accountability, and perceptions of education stakeholders. With improvements in these aspects, it will be easier to explore the potential for support for the acceleration of higher education innovation which in turn will be able to accelerate quality improvement and be responsive to the demands of the labor market and the development of industrial era 4.0.

1. INTRODUCTION

Innovation is crushed by the times. Entering an increasingly modern and dynamic era, this sentence seems familiar to the ear. It sounds cruel, but there's some truth to it. The world is rapidly changing. As a result, the challenges and problems faced by people in various parts of theworld are also increasingly complicated. The most obvious example occurs in Indonesia where we live and work everyday. In the immediate environment, competition and development of knowledge and technology are so fierce, so that the problems and challenges faced are more and more complex. Start from environmental issues, health, availability of living space, food to simple problems. Solutions that used to work become obsolete and can no longer address these challenges. For this reason, the contribution of the younger generation is needed to create new, fresher solutions. The only way is to innovate. Innovation itself can be interpreted as a process of changing something that already exists to be more valuable and useful. It is the young generations who have creative, expressive characteristics and always have fresh ideas who must become a repository of innovation.

The rapid development of information technology in the era of the industrial revolution 4.0 must be a concern for the Indonesian people, especially higher education circles. With mastery of information technology can support all aspects of higher education services, so that improving the quality of Indonesian universities can be achieved.

The quality of higher education is directly proportional to the competitiveness of the nation. The nation's competitiveness can also increase along with the increase in the quality ofuniversities in Indonesia. The high competitiveness of the nation can ultimately increase the economic growth of a nation. If Indonesia wants to increase economic growth but there is no competitiveness, then this will bea problem.

Therefore, in order to face the digitalization era, through various policies, including freeing studyprograms nomenclature to support competency development in industry 4.0, building a teaching factory industry 4.0, conducting online lectures to increase the capacity

and quality of higher education flexibly, across spaces and time, as well as collaborating with foreign universities toinnovate that supports and fits the times.

Identification of the problem is that currently management standards in private higher education are still varied, so they are directed to an innovative approach to higher education management, such as the field of learning, with the hope of creating a conducive climate and organizational culture so as to accelerate the occurrence of private education management innovation in West Java in particular and can wider distribution of other private higher education are still varied, so they are directed to an innovative approach to higher education management, such as the field of learning, with the hope of creating a conducive climate and organizational culture so as to accelerate the occurrence of private education management innovation in particular and can wider distribution of other private higher education.

2. PROPOSED METHOD

This research was conducted using descriptive methods and with a qualitative approach by taking data with observations at universities, giving questionnaires to 100 respondents from several stakeholders in higher education and then conducting interviews with random picked samples to find out more about the constraints and problems contained in the management system implemented in Higher Education. Observation looks at the patterns and models of management carried out in a higher education, then the results of the observations will be coded analysis to find out what management models and patterns are implemented in the university.

Questionnaires are given to find out the management patterns and models that have been carried out by the stakeholders in the higher education. Then interviews were conducted to obtain more in-depth descriptive data on what was the cause of the obstacles in the management system implemented at the universities.

From the data received through the process of observation, questionnaires, and interviews, problem solving analysis was carried out to be able to formulate a higher education management innovation model that could be carried out and in accordance with

the needs of universities.

3. RESULTS AND DISCUSSION

The results of observations show that the pattern and model of higher education management are similar among several universities that are the subject of research, the pattern is more likely to be the pattern of management and public administration which is the standard and basis of higher education management in Indonesia. Another thing that was found was the use of paper-based administrative documentation, up to down coordination, and lengthy regulations in policy spending and information flow both internally in higher education and externally.

Based on the survey results prior to implementation, most private higher education policy makers do not fully know the strategies and procedures for implementing management innovation, for example in integrated online learning management innovations based on easy webometric data and in accordance with the curriculum for innovation management in higher education.

The results of interviews, questions and answers and direct observations during the study showed that the stakeholders of higher education were still not competent enough to carry out developments and innovations formed by management internally, especially in management innovations related to technology, another factor was the motivation of stakeholders in conducting studies innovation in their respective higher education. From these data, problem solving analysis was carried out by looking at how the management of higher education in the industry 4.0 era can develop to look for innovative and sustainable higher education management models. Technological developments in organizational management systems are also a key factor in the development of higher education management innovations.

Management Innovation Concept

Birkinshawa and Mol (2006) in (Darwanto. W, 2014) state that management innovation is the implementation of a new management application, process, and structure that represents an important start for the company to transform for the better. The process of management innovation is different from technological innovation. There are two

important points that distinguish between the management innovation process and technological innovation, namely (Birkinshawa and Mol, 2006).

The first point is that the management innovation process involves more external parties (external change agents) than technological innovation, where these outsiders provide input and inspiration for management innovation. These external change agents are a mix of academics, consultants, managerial mentors, and former employees. This condition makes the innovation management process require good interaction quality, because a harmonious relationship between managers and external change agents will help manage and bridge the gap between concept and implementation.

The second point is that the management innovation process is a gradual process and can be more diffused than technological innovation. The management innovation process lasts for several years in its implementation, so that the innovation process that occurs during that time cannot be explained exactly when it occurs.

Birkinshawa and Mol (2006) developed a management innovation model in which there are four stages in the model. At each of these stages there are different roles between internal and external individuals.

The first stage is dissatisfaction with a permanent situation (Dissatification with Status Quo), this internal problem that makes management innovation grow and develop. The second stage is inspiration form Other Sources; management innovation requires inspiration and input from several parties, both internal and external, for better company development. These sources of inspiration can be obtained from scientists or academics, consultants, management mentors, and even retired employees. The third stage is invention. This stage is known as the stage, where ideas about new applications, processes, and structures arise from the previous stage. With the presence of internal factors in the first stage and external factors in the second stage, ideas for improvement and creation arise and develop. The fourth stage is internal and external validation. In innovation management, risk and profit uncertainty are always present in every strategic step taken. Therefore, it is necessary to validate ideas or inputs including inspiration that comes from outside and from within to minimize the risks that will arise and to predict profits more

accurately and validly. Validation carried out externally by the company can be obtained from four sources, namely academics or researchers from business schools, consulting organizations, media organizations, and industryassociations.

Management and Innovation

An innovation management process that can bedeveloped through: Dissatisfaction with a permanent situation (Dissatisfaction status quo), Educational institutions as a service industry will experience the above so that these internal problems make management innovation grow and develop by conducting research and development. Inspiration from other sources, innovation requires inspiration and input from several parties, both internal and external.

Educational institutions are educational institutions that involve stakeholders; in this case, higher education innovations which are classified as service innovations must involve sources of inspiration including lecturers, students, government, suppliers, industry players, etc. Invention, ideas about applications, processes and structures that arise from the previous stage. With the presence of internal factors in the first stage and external factors in the second stage, ideas for improvement and creation arise and develop. Educational institutions need to develop ideas that have beenobtained to be realized into new innovations. Internal and external validation.

In innovation management, an institution will inevitably lead to risks and uncertainty of profits, so a strategy is needed to deal with theseproblems. Diffusion, in this stage of communication that is built properly will result in the success of the ideas that are built. This stage also requires targeting resources, addressing resilience, identifying success, disseminating evidence and managing risk. (The Liang Gie, 2004;57) These stages are followed by the development of service innovation management that can be developed in this educational organization including: Create Knowledge Management. Knowledge management is an activity used by organizations to identify, create, explain and distribute knowledge to be used or known by the organization. The application of knowledge

management will make continuous improvement in the field of education. Knowledge Management held regularly will foster creativity and innovation.

Educational institutions as a forum that produces research should be used by all members of the organization. Creating a new business model, by creating a new business model a new organization will experience a fundamental change in the way to increase revenue and profits. For this institution, what needs to be developed is market development by creating wider customers and creating more value for customers. In this case, this institution can develop new school pioneers which will become the institutional market segment. Develop new services.

The development of new services developed can be in the form of developing a new culture. Several cultures need to be developed, such as a culture of creativity, a culture of spreading knowledge that has been hidden in each other so far. Each member of the organization must create creativity in each unit and the knowledge gained from seminars, workshops, and further studies needs to be developed at this educational institution. These new services can be driven by new technologies. The development of this new technology will facilitate services for students and lecturers. This new technology will make it easier for the Head of Study Program, lecturers and students to get data easily and make decisions. Create a new customer interface. ICT (Information Communication Technology) is very important for the relationship between customers and service providers. The technology that can be developed at this institution is for example e-learning, with e- learning it will facilitate new interactions between customers and service providers. In addition to facilitating interaction with e- learning, it will save costs. Creating administrative innovations.

Administrative innovation can be done in the form of innovation in SOP (Standard Operating Procedure). Things that can be done include speeding up service time in all units. Create a curriculum design. The curriculum in educational institutions must be adaptive, the curriculum must be adapted to the needs of the community, curriculum development must be adapted to science and technology and the curriculum must contain the values adopted by the community and adapted to the national culture and local culture and then the

curriculum must be able to anticipate changes social in society Designing the learning process. Consumers of educational institutions that are currently faced are the millennial generation; educational institutions must have creativity in the learning process.

One must look for learning methods that are in accordance with current consumer conditions, one of which is by using dynamic teaching. To make the breakthrough above, it is necessary to have support to facilitate innovation. Creativity, creativity is an idea, an idea that is able to bring change in an activity of life. Organizations need ideas or ideas from both internal and external organizations. Knowledge, knowledge is all relevant understanding that leads individuals to seek creativity. So, an innovation will emerge when creativity and knowledge become one. In addition to creativity and knowledge, innovation demands various competencies at each stage of the process. Innovation needs to be driven by community needs rather than policies and processes (Mc-Leod-Jr, 2015, p. 32).

Knowledge Management in Libraries

Almah, Hidawati (2013, p. 95) stated that the application of KM (Knowledge Management) into the university library system is carried out as an effort to implement and improve what are the main tasks and functions of librarians. In this case, the main thing is as a unit to support lecture activities for the academic community (lecturers and students) in supporting the creation of the Tridarma of Higher Education. The existence of a university library as an institution that supports the learning process is very important.

This is inseparable from the function of the library in Almah, 2013, p. 95) namely: Recording knowledge, the library as a place to accumulate records of human knowledge in its era. With the aim of remembering and conveying knowledge. With the accumulation of knowledge comes the opportunity to conduct research. Libraries have educational and research functions. The results of education and research are written in the form of books, articles and so on. Then it is managed in the library to be reused in the education and research process The function of culture is to store the results of community culture Recreational function, what is meant by recreation here is a process carried out by someone in creating new ideas or being creative again from the collections available in the

library.

Observing this function, the library has a major role in the information cycle process within the academic community in the university environment. For this reason, so that libraries can play a strategic position related to the flow of information in the university environment, libraries need to be creative in managing knowledge. So that the library will not be neglected or left behind from the process of change that occurs in the academic community. One of the library approaches in innovating is by applying the concept of knowledgemanagement. Through the concept of Knowledge Management, it is possible to carry out the process of creating new knowledge in thelibrary organization. This requires library management to make adjustments in variousways, both in aspects of the system, organization, culture, library resources, and other aspects.

Why is the library innovation process using the concept of knowledge management, that knowledge creation is the essence of innovation (Almah, 2013, p. 96). The library can do in applying the concept of knowledge management, through several stages.The stages that can be done by libraries in implementing knowledge management are: Evaluating the existing library system, this process will give us an understanding of thebasic problems that occur in the library.Identification of needs. In this case, the consumers of libraries in universities are students and lecturers. It means that the purpose of the library is to provide the knowledge neededby them, namely as a distributor of knowledge by Tang Shanhong (in Almah, 2013, p. 96).According to Halil (2016), p. 96) the basic principle of implementing knowledge management is to improve the system in the library that is currently running. So, the process of transferring knowledge or information in the library runs well and simultaneously.According to Hendro Wicaksono (in Almah, 2013, p. 98) one of the components in the application of knowledge management is theavailability of tools as a means to share knowledge. This is as the industry does in implementing knowledge management. For thisreason, the realization of knowledge management in the library is by building several facilities or sharing knowledge, including: Create a library portal/web as a place for sharing Creating an internet network asinfrastructure Providing internet facilities in

thelibrary Carry out the process of digitizing thelibrary connection.

The internet is one of the tools that can be used to share knowledge in the library. The purpose of this internet is built, among others: Means of providing information resources (information resources) electronically with access to the internet Optimizing the use of the information technology infrastructure that has been developed. Providing information resources that are easily accessible by the academic community in the university environment Develop library services by providing more choices of scientific document formats forlibrary users Fulfill links to learning resources that can support the implementation of problem based learning methods that allow students to access certain learning resources without havingto come to the library, but simply access them from the lecture hall or tutorial room.

The activities carried out to prepare the internetin order to provide search aids include: Download journal aarticles from database Scan textbooks Converting scientific papers in pdfformat Editing and updating printed journalarticles Editing and updating the catalog ofprinted scientific papers Back up data on CD and hard disk Designing an internet accessible website. Upload data to internet website. The internet can be accessed from the universityenvironment in a local area network (LAN) or through an access point within the faculty. The resources that can be obtained from the internet are in the form of: Online Catalog (OPAC) E-books Electronic scientific works Electronic articles Knowledge Management (KM)-based library innovation, an overview of its implementation can be seen in the library managed at the Indonesian Education University as a reference for other higher education in the vicinity.

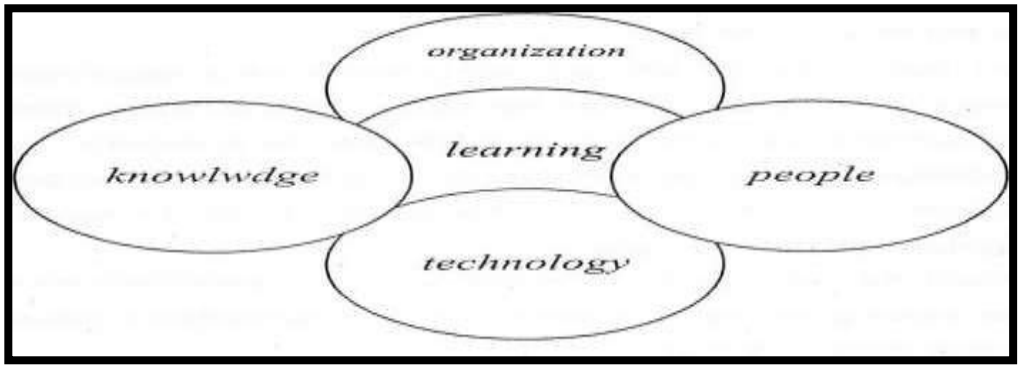
Because in its implementation, the Indonesian University of Education Library already has library services most of which use technology digitization. One of them is borrowing books, returning books, searching for books, absentfrom entering the library, and there are facilitiesthat are able to detect to minimize fraud committed by library visitors, namely when there are library books whose status has not beenborrowed but have been taken out by visitors, there will be an alarm tone to detect it. So that the system

implemented in the library is able tohelp the performance of librarians in serving visitors effectively and efficiently.

As well as book lending services as a means of disseminating information and knowledge from book sources in the library can run properly for the benefit of the academic community service. In its implementation, it is still necessary to update the system that is carried out so that errors do not occur that harm certain parties, such as for returning books, there are often books that have been returned undetected, whichresults in visitors having to look for books that have been returned it. Although system errors are an obstacle, however, the innovations carried out in this library are considered to have a greatinfluence that is good for all elements in universities, because the function of the library as a source of information for all academics and librarians as managers can maximize their dutiesand functions in serving all library visitors.

Understanding Learning Organization and Higher Education Innovation

A learning organization according to Marquardt (1996) is defined as an organization that learns seriously and collectively, and then transforms itself to better collect, manage, and use its knowledge for organizational success. The learning organization model, according to Marquardt, has characteristics consisting of 5 (five) subsystems that are interrelated and support one another, namely learning, organization, people, knowledge, and technology which are described in the systems learning organization model, as follows:

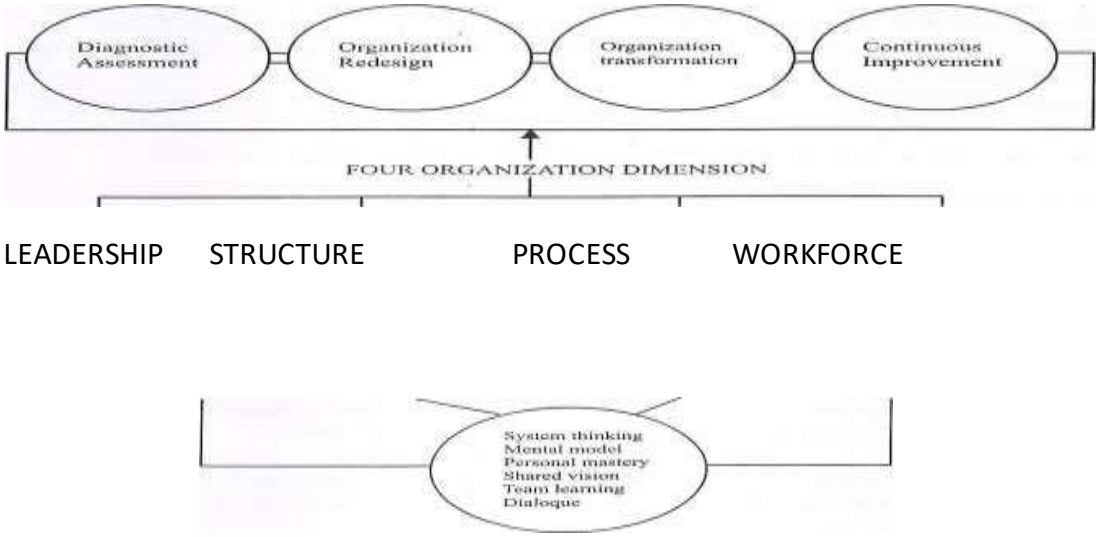


4.

Meanwhile, according to Linda Moris (inBuhler: 2004) said that an organization that hascharacteristics include: (a) having a clear vision; (b) always think systemically; (c) alwaysundergoing transformation and development; have a focus on developing creativity; and always linking individual human resource development with organizational learning. Organizational learning includes ten elements that can support (Buhler, 2004), namely: A challenging vision and a sense ofbelonging to the community are critical to the success of organizations that are learning to go global; An appropriate organizational structure that can encourage learning in an organization; The culture of learning in the organization that provides a climate that encourages learning; Empowerment by trying to reduce dependence on superiors and encourage responsibility for employees who are able to learn to solve problems and be creative in developing themselves.

Observing the environment or changes in the organizational environment is very important to prepare yourself to be able to solve problems in an anticipatory and proactive manner; The creation and dissemination of knowledge that is open sourced from outside butalso from within individuals and organizations; Learning technology used to deepen and store and create knowledge; The quality of services and goods produced by the organization is an element of organizational learning in globalization; Learning strategies must exist and be sustainable and integrated with real work; A supportive environment by creating abetter climate for individuals to be productive by: developing optimal human resources, respecting human dignity, tolerance for different opinions, autonomy and equity/justice, and being humane and democratic.

The higher education innovation management strategy in a learning organization can be described as follows:



The higher education innovation strategy beginswith a diagnostic assessment, which then results in an organization redesign. Next is theorganization transformation, to then produce continuous improvement, which will then returnto an iterative process. The process is influenced by the organization dimension in the form of leadership, structure, process, and workforce which is influenced by the learning dimensions in the form of systems thinking, mental models, personal mastery, shared vision, team learning, and dialogue. Some key aspects of higher innovation management: first, Research and Development Punding Higher education institutions can allocate resources and funding to support research and development activities that have the potential to lead to innovative breakthroughs. This may involve establishing research centers, providing grants to faculty and students, and collaborating with industry partners.

Second, entrepreneurship programs, Universities can offer entrepreneurship programs and incubators that provide aspiring innovators with the knowledge, skills, and resources needed to turn their ideas into viable businesses. These programs often offer mentorship, training, and networking opportunities. Third, Managing intellectual property rights, such as patents, copyrights, and trademarks, is crucial for protecting and commercializing innovative ideas. Higher education institutions need to have clear policies and processes for managing and licensing intellectual property developed by

faculty, researchers, and students.

Collaboration with industries and businesses can facilitate the transfer of knowledge, technology, and expertise between academia and the private sector. These partnerships can lead to joint research projects, technology transfer agreements, and the development of real-world applications for academic innovations. Higher education institutions can integrate innovation and entrepreneurship into their academic programs, ensuring that students are exposed to innovative thinking, problem-solving, and hands-on experiences that prepare them for the rapidly changing job market. Developing metrics to measure the impact of innovation efforts is important for assessing the effectiveness of innovation management strategies. This could include tracking the number of patents filed, successful technology transfers, startup creation, and other relevant indicators.

Creating a culture that values and supports innovation is essential. This involves promoting open communication, risk-taking, and collaboration among faculty, students, and researchers. Technology Transfer within universities play a vital role in managing the commercialization of academic research. They facilitate the licensing of technologies, negotiation of agreements with industry partners, and the establishment of spin-off companies based on university inventions. Hosting innovation-focused events, workshops, and conferences can help connect academia, industry, and other stakeholders, fostering knowledge exchange and collaboration. The field of innovation is constantly evolving, so higher education institutions need to stay up-to-date with the latest trends and best practices in innovation management. Effective higher innovation management can lead to increased research output, economic development, job creation, and the successful translation of academic research into tangible societal benefits.

Conclusions and Suggestions

Based on the results of the research above, the research "Management Innovation in Higher Education", it can be concluded as follows: The implementation

of knowledge management significantly affects the efforts of universities to achieve higher learning process performance. This finding further emphasizes that university leaders must apply the principles of implementing management comprehensively in various fields to support the implementation of a learning process that is able to meet the needs of students; Meanwhile, the implementation of innovation management has a significant influence on the university's efforts to achieve performance.

This finding further makes it clearthat innovation is a core strength that can be usedby universities to achieve performance so that they can increase competitiveness, grow and develop sustainably; The implementation of knowledge management and innovation management that is carried out simultaneously affects the efforts of universities to achieve performance significantly, with a relatively greater effect when compared to the implementation of knowledge management and innovation management which are not carried out simultaneously; This reinforces the framework of thought in this research where knowledge managed in the higher education knowledge management system which is then acquired and implemented in activities carried out by the university will produce innovations which will then be managed through innovation management.

The utilization of these innovations will then help higher education institutions to achieve their performance by achieving student and parent satisfaction, the absorption of graduates in the world of work, the achievement of the number of publications and research, achieving the desired ranking and accreditation and recognition, and can be sustainable by continuously increasing quality of human resources and facilities that will provide competitiveness and growth for universities.

Suggestions

Based on the explanation of the conclusions above, there are recommendations that can be given to universities through this research as follows: Within the scope of knowledge management implementation, universities must improve the effectiveness of knowledgemanagement implementation covering all fields more comprehensively,

not only in academic fields but also in non-academic fields that support their core business so that they are able to provide value to students. College. Likewise, the components in the implementation of knowledge management such as technology, processes and human resources that run it must always be developed.

Universities must maintain their ability to manage their organizational knowledge in accordance withthe appropriate stages and methods. There needsto be a commitment from university leaders to the application of knowledge management in their organizations so that they can create programs and an academic environment as wellas higher education management that supports a culture of sharing knowledge and supports success in the implementation of knowledgemanagement so as to be able to create or increase the value of his services; The application of innovation management in an organization, including universities, really needs to be supported byleadership from leaders who are able to demonstrate creative thinking and become role models for organizational members to dare to innovate and be able to create an organizational environment and culture that supports the birth of ideas.

Innovative ideas from its members, such as changing the bureaucratic system that reduces creativity, recognizing and rewarding members who succeed in creating innovations that add value to the organization, and facilitating them to develop creative ideas. This their work through protection and management of risks posed by an innovation. Thus, universities will be able to create products, programs and service processes that provide added value for university stakeholders throughthe process of innovation activities that occur in them and achieve performance and increase competitiveness.

COMPETING INTERESTS

The author has no competing interests to declare.

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HOW TO CITE THIS ARTICLE:

Nur Aedi (2023). The Challenge of Innovation Management Model For Higher Education In Industrial Revolution Era 4.0. *Seybold Report Journal*, *18*(07), 172-190. https://doi-ojs.org/10-5110-77-9129/

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