Improvement of Education Quality Management and Competence Development Lecturer in the Industrial Revolution Era 4.0

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Abstract— Entering the industrial revolution era 4.0, lecturers are required to always upgrade their skills and abilities in educating the nation, and improve the quality of human resources because they are required to have pedagogical and professional, personal and social competencies. The research aims to reveal, explain, and find a model of how the management development strategy for improving the professional competence of lecturers. The methodology used descriptive analysis by showing the various current events that have a positive impact on the increase of professional expertise of lecturers. The findings were (1) the policy of planning lecturer by institutions are still weak and less attention to aspects of mapping needs; (2) the implementation of a management development rests on the competence of lecturers lacking fulfillment aspects of student services; (3) The strategy of management development for the improvement of the expertise of lecturers not well coordinated, and (4) management oversight for improving the professional competence of lecturers less attention to aspects of management. The results of the study using SWOT analysis found a high motivation factor for lecturers if there were supporting factors available and there were inhibiting factors due to the unavailability of special intensive programs that were ongoing because the campus was temporarily preoccupied with the student recruitment system so that the quality management tasks of education were neglected especially those related to professional assignments lecturer due to lack of guidance in managing the academic community in the face of the industrial revolution era 4.0.

Keywords— quality management; teaching learning; lecturers competence; industrial revolution 4.0.

I. INTRODUCTION

The lecturer is one of the essential components of the higher education system. The role, duties and responsibilities of lecturers are significant in realizing the goal of education, i.e. educating the nation, and improve the quality of human resources. The variety of human resources in question are covering the condition of faith, character, mastery of science, technology, and art, realizing society developed, just, prosperous and civilized. Lecturers are educators who have a role as a determinant of the success of the college goal besides other educational personnel, for the lecturer who directs contact with students, to provide guidance estuary produce graduates correspond as expected. For the performance of teachers should be developed and improved. Efforts to improve the concert done in various ways, including gives the opportunity to thrive in a career in a professional manner; ensuring a chance to increase their knowledge and continuing education to higher stratum; paying attention, rewards and incentives; ensuring that there is an opportunity to develop the right leadership style of learning, and the existence of an excellent social security. In this era, many a reduction in labor or labor for manpower has been reduced drastically. The existence of human energy displaced by the presence of machine tools is controlled electronically so that it can produce production quantity more.

The Industrial Revolution 4.0 is indirectly demanding world of education to transform itself towards a better. With the characteristics of the working world in this era, of course, affect the change in the type of jobs available. The challenge for the campus in the era of the industrial revolution 4.0 is not only related to the effort to prepare graduates with various skill above. It is no less important is the setting up of human resources, especially lecturers. Generational differences between faculty and students considered as a significant factor in the failure of education. Professors who teach in universities majority come from generations X and Y have different characteristics of students who are now inhabited by generations of generation Z. Z attached to the digital appliance does not match the learning method offered by the lecturers. The use of conventional ways of learning for the Z generation is
something that is not interesting. Gap or difference that is the biggest single problem facing the world today campus (44). Thus, the need for continuous competence development faculty across campus. The aim of this development so that the quality of learning and college graduates by the demands of the working world in the era of industrial revolution 4.0.

Entering the era of industrial revolution 4.0, education must immediately clean up in preparation, particularly related to human resources in college-lecturer as a determining factor in the progress of knowledge required to upgrade the skill and ability always. In the era of industrial revolution 4.0, profession increasingly competitive faculty. Given the rampant competition in the era of industrial revolution 4.0, then the profession lecturers should also be developed in line with the pace of the times. For this reason, some of the competence of lecturers in education era 4.0 must remain controlled, namely:

- The competence of lecturers in this era cannot equate with the expertise of an earlier age. Today, the presence of the Internet of Things (IoT) has been part of human life. Thus, the ability to understand and use various IoT-based tools for education and teaching must control. IoT is a condition that allows people or objects that can connect with anyone, anywhere, and anytime. IoT is a relatively new technology that appears to facilitate between the real and virtual objects (1). IoT in everyday life is very often encountered and even becomes a necessity that must meet. In education, a real example of the application of IOT is the implementation of electronic learning or e-learning, distance education (distance learning), digital libraries (digital library), e-commerce for SMEs campus, and others. For this reason, the competence of lecturers must continuously be upgraded to familiar themselves with the various devices that connected to the IoT in the learning process.

- One of the duties of lecturers in addition to teaching and carry out community service, is research. In carrying out research tasks, of course, lecturers must master a variety of skills in research. Skills in research is a skill to identify the problem, identify the sources of information appropriate to respond to the question, assess the quality of the relevance of the information found, and use information effectively to resolve the issue (8). In this industrial revolution era, competence in research also penetrated the broader realm. Each lecturer than as educators and researchers are expected to build networks in developing science and research both nationally and internationally. Moreover, lecturers should be skilled in seeing the trend of world research to be able to determine the direction of the study and assistance/research grants from abroad: a).Technological competence for commercialization: College as a center of science and technology innovation. But in practice, many schools are experiencing difficulties in commercializing innovation of science and technology mentioned. The commercialization of new technology invented by professor or college has a significant impact on economic growth, science and technology, universities, and industry in a sustainable manner. However, the majority of the commercialization project in Indonesia is not able to achieve satisfactory results because risks are too high; the strict rules, taxes too much, and it is not guaranteed. It is expected that professors have competence in commercializing technology out of the campus even to overseas. One of them is result-based research collaboration with students, faculty and abroad or innovation results that has a sale value in society. Results of innovation and research should not only be used as material to be commercialized report but also to the audience to get the profit. b). Competence in Globalization: According to (39) there are seven global competencies, namely: general competencies or generic competence, the ability of the IS or Information System, the power of ICT, the capability of project management and leadership, competence knowledge management and collaboration, communication competence, and intercultural competence.

The competence of lecturers determines the quality of the implementation of the Tri Dharma of Higher Education shown in carrying out their duties in a professional manner that has pedagogical, professional, personal and social competence (19). How to deal with changes in tertiary institutions places itself in the era of industrial revolution 4.0? Must improve quality through a curriculum improvement strategy, quality learning, management with professional management, adaptive and responsive in order to produce quality graduates who have noble character, creative, innovative, nationally oriented, intelligent, healthy, disciplined, responsible, skilled in mastering science and technology, entering the era of industrial revolution 4.0 or abbreviated IR4 which indirectly demands the world of education to improve itself towards better (2,8). Facing these challenges, teaching in higher education is also demanded to change, including in producing quality lecturers for future generations. The challenge for the campus in the era of the industrial revolution 4.0 is not only related to efforts to prepare graduates with various skills but also to prepare human resources, especially lecturers. Why is that? The majority of lecturers who teach in tertiary institutions are from generation X, and Y has different characteristics from students who are now mostly inhabited by generation Z. Generation Z which is attached to its digital characteristics from students who are now mostly inhabited by generation Z. Generation Z which is attached to its digital devices does not match the learning methods offered by the lecturers. Therefore, there is a need to continuously develop lecturer competencies throughout the campus so that the quality of learning and university graduates is in accordance with the demands of the world of work in the industrial revolution era 4.0. (9,10)

This research was conducted at the University of Wijaya Kusuma Surabaya. The condition of the data source occurred due to a decrease in the professional competence of lecturers due to several factors including (a) neglect of the potential development of lecturers; (b) the low quality of learning and
education processes; (c) declining potential for university development; (d) decreased overall institutional performance and (e) low student interest in learning. Given the enormous role of universities in preparing quality human resources, as well as the important role of lecturer positions in the education and learning process in high education, then this research is focused on improving the quality management of education and teaching in developing lecturer competence in the era of the industrial revolution 4.0. (11,12).

II. METHOD

A. At the first

The Purpose: identify, study and explore issues of technology literacy, knowledge deepening, creation, openness innovation, pedagogical, professional, social and personality competencies for the development strategy of lecturer competency management in the Revolusi Industry 4.0 Era in expressing a variety of direct events. Time: The study was conducted for 1 year. Location: Wijaya Kusuma University, Surabaya. Then next is to develop strategies for developing lecturer competency management in the Revolution Industry 4.0 Era which include: competence agility, innovation, creativity, anticipation, experimentation, open-mindedness & networking / networking. The last, To implement the results of activities supporting the strategy of developing lecturer competency management in the Revolution Industry 4.0 Era during the learning process which includes infrastructure, human resources, work environment, and support services.

B. Research Stages

Exploration of various sources directly by conducting interviews, especially to the dean, vice dean of academic and student affairs, the head of the department, and to students and quality assurance bodies at the university level; Continued with policy makers at the faculty level as operational management who correctly understand the orientation of the development of lecturer professional competence management; Confirmation and coordination with the rector and foundation as the main policy maker at the university level.

C. Data analysis

At the first year, Results Data on technology literacy, knowledge deepening, creation, openness innovation, pedagogical, professional, social and personality competencies are evaluated and internal audited by using qualitative and descriptive approaches in revealing various events and then used as material for review to see the effectiveness of management systems that have been built, policies quality and quality targets that have been set in the strategy for developing lecturer competency management. The second, The results of the lecturer competency management development strategy data include agility, innovation, creativity, anticipation, experimentation, open-mindedness & networking / networking tested and developed with qualitative and descriptive approaches in revealing various events then carried out to see the effectiveness of the management system that has been built, quality policy and quality objectives that have been set. The third year, The results of the lecturer competency management development strategy data are implemented during the learning process which includes infrastructure, human resources, work environment with a qualitative and descriptive approach in revealing various incidents and then used as review material to see the effectiveness of the management system that has been built, quality policy and quality objectives has been established

III. DISCUSSION

Policies outlined in formulating management program development competence of lecturers based on the law on teachers and lecturers, law Sisdiknas, government regulations on National Education Standards, Permendiknas on Standards of educators have been appropriate on aspects juridical force in the State Indonesia. Development of the competence of lecturers not only on one component, but the development of expertise conducted specifically on pedagogical knowledge and professional ability and generally on personal skill and social competence (Government Regulation No. 37 the Year 2009, explains that the lecturer has some expertise in carrying out their duties, namely "pedagogical, professional competence, personal competence and social competence") (30,31,32,33).

Policies in developing the competence of lecturers held at the Universitas Wijaya Kusuma Surabaya has facilitated courses on a regular basis, a facility learning process has equipped with a variety of media, universities provide relief donation education funds to each faculty who excel, apply the rule that the learning should be in accordance with the level held as motivation to lecturers to improve their academic qualifications so that they can develop themselves according to their competence-forming the Quality Assurance Agency (BPM). BPM is a tool that enables educators to adapt to the "forces of change" so that universities have educators who can do the maturation process quality learners. This is by the opinion of (40) said that: "Education is a top quality education that can make the process of maturation of the quality of learners developed by freeing learners from ignorance, inability, helplessness, dishonesty and of bad character and faith. Quality education is born of a sound planning system, with the material and of a good governance system, and delivered by an excellent educator with components of quality education, especially teachers ". 
Based on the results of the study, the researchers argue that the policy formulation faculty competence development program has not run by the demands of the existing policy. Thus, this situation is not in line with the idea of (14,15) indicating that, "Education policy is supported by research and development. Education policy is not abstract but which can be implemented". So every planning strategies need to be based on a procedure that can perform activities.

Based on some of the above that the strategic management as a set of decisions and actions that resulted in the formulation (formulation) and execution (implementation) plans designed to achieve the goals of the organization, and to make the goals the organization has the task of which is: "To formulate a vision and the organization's mission includes general formulation philosophy and objectives, develop a profile that reflects the condition of its internal organization, assess the organization's external environment includes competitor and contextual factors, identifying each alternative strategy to determine which approach is most appropriate vision and mission of the organization, implement a strategic choice by allocating analyzing alternative strategies to adjust its resources to the external environment of budget resources that emphasizes conformity between tasks, structure, technology, and the reward system".

SWOT analysis set out in the preparation of the competence development management program lecturer at the University of Wijaya Kusuma Surabaya that researchers do use position analysis using the SWOT approach. Four factors make up the acronym SWOT (strengths, weaknesses, opportunities, threats). This process involves determining the specific purpose of speculation education or project and identifying the internal and external factors that support and that is not in achieving that goal.

Based on the SWOT analysis, strategies used in dealing with the external aspects supported by the internal elements are as follows: The provision of a library, internet provision and provide an opportunity for faculty to improve the academic qualifications to a higher level, namely from S2 to S3. These strategies are a priority to 4; The utilization of vacation time lecturer for training activities. These strategies are a priority to 2; Maintaining motivation of lecturers by providing award/reward in the form of material or non-material, allowing the lecturers to improve the academic qualifications to a higher level, namely from S2 to S3, and always measure the achievement of quality lecturers. These strategies are a priority to 3; Determination of the performance and productivity of professors, lecturers and strengthen processes to add PMB. This strategy is the first priorities.

(46) Say that: the form of the development of the competence of lecturers is: "Theoretically, faculty competence development management can improve the ability of faculty to do the job. Through the business process to enhance the technical skills, theoretical, conceptual and moral faculty by the needs of the job/position through education and training. Furthermore, supported by the opinion of (50): "Consist of planned training programs designed to improve performance at the individual, group, and organizational levels. Improved performance, in turn, implies that there have been measurable changes in knowledge, skills, attitudes, and social behavior."

According to (Nan Jiang, World Economy, 2015, 2017), "The process of strategic management consists of three stages: strategy formulation, strategy implementation, and evaluation of the strategy". The principles of strategic management are the strategy formulation that reflects the desires and goals of the organization are real; their implementation strategy that describes how to achieve the goal.

Related to this opinion, it is for the development of the ability to master this media multi required some technological facilities (a) the development of information technology competence because this age is called the age of information technology. Developments in information technology so rapidly is a new challenge for education professionals, including lecturers. Educational experts consider that mastery of the lecturers on information technology influence on its success in managing the learning in college. Therefore, lecturers need to train in the use of various technologies currently available information; (b) develop competency management/administration and college management system is different from management in other institutions. Similarly, the management model implemented in a higher education change based on the development of the college. With this assumption, the lecturers as a significant part of the college needed to be directly involved in managing universities, both at the level of university leadership, faculty, courses, and teams set up correctly for a particular purpose. Therefore, the development of management skills is significant for the faculty, the administration and management capabilities they need to increase. To support the management capabilities of the faculty, the form of development is necessary given the intensive and continuous training on the management/public administration, management colleges, academic administration, faculty, education strategy formulation, basics of education planning, curriculum management, decision-making, administration/human resource management; (c) development of competence curriculum, because the curriculum is a very important fundamental for printing high-quality students. A good curriculum is a curriculum which implies attention to the ability of learners and can encourage their ability to be creative and innovative power.

The above authors' description suggest that the mastery of discipline is not the only measure of success that the profession of a lecturer. They also demanded to be able to formulate a curriculum that can create graduates with high academic achievement, behave honorably, ethical and virtuous. Therefore, the lecturers should be allowed to follow the latest developments in the field of knowledge acquired so that they can formulate the curriculum is also based on the latest developments. They also need to be supported morally and funds to organize various activities aimed at creating the best curriculum that an innovative learning model is a crucial success to develop the learner as an individual, to build capacity to think smart and wise and make social capabilities and commitment "and creative learning model is an ability to
produce something new, a new kind for himself or others". Therefore the proposed strategic models offer researchers to develop professional competence management is communication quality management lecturer Faculty's academic services, as shown in the following figure:

Fig. 1. Eodel quality of service academic lecturer

Significant steps to apply the model should be accompanied by an increase in human resources management, in this case, according to (48,49) reveals that the purpose of the development of human resources is: "to attract, develop, and motivate personnel in order to (a) achieve system's use, (b) assists members in satisfying position and group performance standards, (c) maximize personnel career development, and (d) an individual reconcile organizational objectives".

The results that have achieved in the development of pedagogical competence and the competence of lecturers in Universitas Wijaya Kusuma Surabaya demonstrated include: (a) in rotation educators active lecturer at the scientific forum and as the author of scientific papers and speakers or resource persons both national and international levels; (b) the lecturers educators increasingly passion for writing and composing an excellent book textbook, modules or diktat; (c) the mandate given promoted to professor of structural officials; (d) educators active faculty conduct research according to the scientific fields which have obtained include classroom action research, research on education and teaching; and (e) an active lecturer educators as well as education supervisor of learning group activities in the neighborhood.

Supporting factors and obstacles in the implementation of development competence of lecturers professionals at the Universitas Wijaya Kusuma Surabaya, including: 1) the supporting factors, namely: (a) the existence of financial support for the development of the competence of lecturers professionals both internally and externally in the form of funding continuing education, seminars, training, and make scientific work, (b) cooperation with associations and government agencies, (c) the development of infrastructures such as collections of related subjects, to support the development of pedagogical competence and professional competence of lecturers, (e) equipping facilities information communication technology used the quality assurance agency (bpum) university to ensure the quality of education in the process of presenting the latest information in all matters relating to the regulation of universities and development competence of lecturers professional and always provide motivation to lecturer in improve their professional competence, (e) the unit for quality assurance (upm) in the faculty, and in the study program specifically serves to develop the assessment and development of the system and the quality of learning and the results are used by the study program and task to evaluate, monitor, on an ongoing basis, (f) enactment of the internal quality assurance system (spmi) which is a self-evaluation system continuously until it reaches 24 national standards of higher education, (g) facilities and infrastructure to support learning; 2) obstacles: (1) suspension for lecturers educators whose qualifications have not been in accordance with the fields they teach; (2) the number of students not in accordance with the means of many educators and lecturers there, (3) support fund education costs are limited, due to limited funds for education compared with the existing number of lecturers.

IV. DISCUSSION

Supporting factors in the implementation of the development of pedagogical competence and professional competence, include: support both internally and externally, cooperation between educational institutions, development of infrastructure, among others, the availability of technology following equipment this case as a means of educators (faculty) to be used as a medium of information, so as to strive to actively writing scientific papers published by national and international journals. The leading supporter of the development competence of lecturers is their policies, their programs and their opportunities and funding for the development of the expertise of lecturers. Other supporting factors are the relevant institutions for the development of the competence of lecturers. The agency both universities, government agencies, private organizations, industry, company, as well as public institutions. Last supporting factor is the ability, motivation and efforts of the lecturers themselves to learn to improve their competence. The lecturers of the Universitas Wijaya Kusuma Surabaya, in general, have the ability, passion and motivation are large enough to enhance their expertise. While the inhibiting factors are the absence of a specific policy on the development of pedagogical competence and professional competence of the ministry that houses the faculty of education. Implementation of policies and programs, especially from the ministry sometimes not optimal due to constraints in translation, communications, bureaucratic, administrative, executive weakness, as well as the readiness of the faculty in following all the procedures. Another limiting factor is the university is not much make or organize special
programs or program priorities for the development of pedagogical competence and professional competence ongoing intensive. These barriers with respect to that university, especially private orientation of the organization of education on the number of students, but it is also the workload of lecturers in institutions are quite numerous discrepancies field provided by the expertise of lecturers, limited funds to those who will study at their own expense, and the competence of lecturers less. 

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