Achieving Social Justice Through the Role of Technology Higher Education Institution: Sociotechnology Discipline and Technoculture Study Program

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Abstract. In such a massive "politicization" of social and cultural life, it appears that the role of Technological Higher Education Institution (Lembaga Pendidikan Tinggi Teknologi/LPTT) in national development is diminishing and less significant with the decline of the role of technology at the national level. The future challenge of LPTT is to increase the role of technology. This LPTT revitalization is highly possible due to the central role of technology in social and cultural life, so that LPTT is not focused only on technology but should also become the Cultural Development Center. The method used in this research is a qualitative method with a case study in Technological Higher Education Institution (LPTT). This method was used considering the demand for technology to immediately link with the society and culture that ultimately leads to quality human civilization. It is time for LPTT to apply transdisciplinary thinking. As a result, the development of the Sociotechnology discipline is proposed. The discipline is implemented in a higher education process and a new nomenclature is proposed for the study program, which is called Technoculture. The discipline and study program work by constructing the Design Thinking Work Method based on the Modeling and Computation Method. Design Thinking that is applied to Humanity, Technology, and Social Science based on the Modeling and Computation Method is part of Digital Humanities. This new approach, including the Learning Method, develops the human resource output from this discipline, and the study program produces human resources with the frame of thought on Applied Science Branch -Sub Social-Sub Sub Public Affairs that supports Social Welfare. This process leads to human resources as pioneers, motivators, innovators, and creators for achieving Social Justice in the nation.

Keywords: Politicization · Sociotechnology · Technoculture · Schismogenesis

1 Introduction

This paper is developed from one of the regulations made by ITB Academic Senate [1] and is adjusted with some regulations that have been effective since 2016. Life in the

Society 5.0 era is marked by the dominant role of technology in shaping and directing human life. There is no life of Ideology, Politics, Economy, Socio-Culture, Defense and Security (Ipoleksosbudhankam) [2] that does not involve technology, which is also the case with Higher Education which according to Law No. 12 of 2012, has six branches of knowledge: Religion, Humanity, Social, Natural Science, Formal Science, Applied Science [3]. Technology has become the determinant force and the "drive engine" of culture, determining its form, direction, and orientation [1]. Therefore, it is impossible to understand people and culture in the society 5.0 era without understanding technology and its determinant role as the drive engine of culture.

Technology has a central role in building contemporary social and cultural life through its various convenience, speed, power, and accuracy. Today there are a lot of social relations and cultural forms that cannot be carried out without the role of technology: communicating, interacting, transacting, and predicting. However, in relation to social and cultural life, technology is like a double-edged blade. On the one hand, technology can bring positive and constructive effects to social and cultural life, such as transparency and honesty. In contrast, it can also bring harmful and destructive effects, such as manipulation and dishonesty [1].

In Indonesia, social and cultural life also cannot be separated from such determination of technology. However, at the national level exists another form of domination, namely domination of political interest and force. There is "politicization" of Ipoleksosbudhankam and aspects in all six branches of knowledge in higher education. Industry and infrastructure development is also inseparable from political interests, such as the development of railway, oil refinery, or reclamation. Ironically, technology itself is not yet treated as something meaningful and significant at the national and state level, which is evident in the relatively small budget for technology research, whereas technology is very decisive for the future of human civilization.

In such a massive "politicization" of social and cultural life, it appears that the role of Technological Higher Education Institution (Lembaga Pendidikan Tinggi Teknologi/LPTT) in national development is diminishing and less significant with the decline of the role of technology at the national level. The future challenge of LPTT is to increase the role of technology. What is necessary today is a form of "technology politics", namely developing the power of technology as the driving force of culture and civilization in the society 5.0 era while simultaneously restoring the central role of LPTT in national development. This LPTT revitalization is highly possible due to the central role of technology in social and cultural life, so that LPTT is not focused only on technology but should also become the Cultural Development Center [1].

This idea of LPTT as the Cultural Development Center is reasonable, because social and cultural life is highly influenced by the role of technology. LPTT should have the authority in understanding human and culture, which is now very determined by technology. As previously explained, human and culture in the society 5.0 era should be understood by understanding the role of technology as the drive engine of culture. It is impossible to understand culture in society 5.0 era without understanding the role of technology.

In the transformation of LPTT into the Cultural Development Center in the society 5.0 era, and with the ideological demand for social justice for the whole nation, it will

change the posture and bring new trends to LPTT. The future form of LPTT is the college with high creativity, pioneers of producing technological innovations, integrated with innovations at the social and cultural level, and able to give significant contributions to realize LPTT's vision as an excellent college that has the ability to lead the change in order to improve the well-being of Indonesians and the world.

Considering the demand for technology to immediately link with the society and culture that ultimately leads to quality human civilization, it is time for LPTT to apply transdisciplinary [4], a strategy involving at least two academic disciplines to solve a specific problem in order to generate a new method or new academic discipline related to technology and culture. Therefore, based on [5] the development of the Sociotechnology discipline is proposed, which means an epistemology of science and technology development with the perception of society and humanity aspects. The function and role of this study are to transform society into a knowledge-based pioneer society that is critical, creative, and innovative. Sociotechnology itself tries to further investigate the connection or relation between humans and technology. This investigation is related to the implication of technology on aspects of life and livelihood of society, how to properly manage the implication and role of technology in improving the level of society on the one hand, and how society should behave and act in accepting the function of technology on the other hand.

The discipline is implemented in a higher education process and a new nomenclature is proposed for the study program, which is called Technoculture [5], emphasizing a deep relationship between technology and culture and raising awareness that technology is now rare or even impossible to be separated from the human. Sometimes humans inhabit technology, or vice-versa; sometimes, technology appears as a part of the body or a substitute device for an impaired body part. At other times, humans appear to serve technology as an extension of a large machine.

2 Rationale

According to Engineers' Hippocratic Oath [8], Engineers must serve humanity in order to enable the improvement of the quality of human civilization, which means there is no science for science's sake or technology for technology's sake. All disciplines started with humanity's wishes, interests, and needs to continuously improve their civilization. This humanity consideration certainly cannot be made by technology alone, but requires mutual, complementary relationship with social-humanity science discipline which is directly related to human intrinsic values [3].

Human civilization as the peak of technological process is the manifestation of life that is built from human thoughts, actions, and works that give meaning to its existence. Therefore, in order for technology to become the pillar of civilization, it must be able to show how it can improve the quality and enrich the meaning of life [1].

Branches of knowledge in a college in general, in LPPT in particular, should be able to improve the quality and enrich the meaning of life, not only with innovation, but more importantly by becoming the pioneer of human civilization. There will be differences between conservative and innovative colleges. A conservative college works through preservation of knowledge and experience from one generation to the next.

An innovative college works by making new knowledge through Cross Fertilization of several knowledge disciplines. In other words, in order to create new knowledge, the college must be prepared to transform itself, according to Schismogenesis [1, 4].

This mutual respect and equality among these many different knowledge disciplines becomes the key to the progress and productivity of Cross Fertilization in various colleges. For example, Nanyang Technological University (NTU), have experts in technology who have great respect and needs for social-humanity disciplines in order to find multi-disciplinary solutions for various national problems in Singapore. This is also the key to the growth of knowledge in Singapore. This condition is called emancipation, which is a process of becoming aware of what can be done by an intelligent person when he views himself as equal to others and views others as equal to him [1].

The development of education through new study programs in LPTT with reference to social and humanity branches of knowledge based on this principle of mutual respect becomes a strength when the study programs being developed are placed on technology platforms, as a manifestation of trans-disciplinary principle. The trans-disciplinary principle can only work when there is a culture of mutual respect among branches of knowledge [3].

Technology is the application of scientific knowledge and other knowledge for practical purposes through physical systems or products. However, is there a common Schismogenesis that can synergize all branches of knowledge on the same platform? For example, philosophy is a form of common discipline that can bring together technology and social and humanity sciences in an encompassing explanation [1].

Within the context of equality above, the presence of technology along with social-humanity sciences should be perceived as a unified whole, encompassing, mutually needing, and inseparable, because everything is for the sake of human civilization without forgetting its history, while continuously aiming for the achievement of social justice.

3 Methods

The method used in this research is a qualitative method with a case study in Technological Higher Education Institution (LPTT). The data collected were used to research the necessity to build two new study programs in LPTT. Those study programs are Sociotechnology and Technoculture. In this research, authors describe the suitable teaching and learning methods for those study programs which both of them should be based on technology and culture. Two steps were done to do this research:

1. Collecting the data from the Technological Higher Education Institution (LPTT).
2. Using Library Research for elaborating the data.
   This qualitative method was used to make sure the finding is relevant with the aim of the research.

4 Results and Discussions

Lecturers in the Technoculture Study Program in LPTT administer learning in the context of equality between technology and social and humanity sciences through topics that

shall be discussed by synergizing technology in relation to its benefits in society. The purpose is to improve the motivation for applying technology for humanity and broaden students' insight. Generally, lecturers assume that they have fulfilled their teaching duties well when they have managed to lead the students to master the concepts in the subject they teach, although it does not necessarily mean that students are able to relate the concepts of technology with people's interests [9].

By linking technology learning with its use and society's needs, the concepts that have been learned and mastered by students are expected to benefit themselves and can be used to solve their own problems and humanity problems around them. Lecturers of the Technoculture Study Program are expected to not only equip the education participants with mastery of technological philosophy, but also with creativity, critical thinking, environmental care, and willingness to take innovative actions to solve real life problems.

The discipline of Sociotechnology and Technoculture Study Program based on Design Thinking with Modeling and Computation Method should be taught in such a way that students become good citizens, responsive to technological development, and able to make critical assessments of the positive and negative impacts of technological advancement, thus able to make wise decisions for society's well-being. Therefore, lecturers should be able to show that there is a reciprocal relationship between technology and society, because technology products are built in order to fulfill the needs of the society, and even further to improve the quality of human civilization, to meet people's needs, to be able to compete, and to give added value to the products they control whether economically, ethically, and aesthetically [9].

To achieve this, lecturers of the Technoculture Study Program based on Technological Sciences should have the ability to develop critical discussion on the creation and use of technological products, which in essence is to develop students' ability to respond, assess, realize, and making conclusions and taking responsible steps as good citizens and part of the community [9].

Based on the above expectations, the interaction between lecturers and students can be done by several methods [9], which can be combined, namely: inquiry method, lecture method, experiment method, demonstration method, role-playing method, problem solving method, discussion method, and discovery method.

In the development of Sociotechnology Discipline and Technoculture Study Program, a learning method is proposed which leads to a terminology known as Society Technology Science, which is: linking technology and its benefits to society. The objective of this learning model is to develop individuals who have technological literacy and care for humanity issues.

A person who has technological literacy is someone who has the ability to solve problems through the use of technological concepts acquired in each level of education, the ability to recognize technological products existing around them along with the impacts, the ability to use technological products and to maintain and improve them, to have creativity in making simplified technological products, and the ability to make decisions based on maximum value for humanity [9].

Technology continues to develop with the development of human creativity and innovation, but this does not mean that humans should be dependent on technology. It is the humans who have the obligation to choose to use the most appropriate technology

to manage nature fairly by observing metaphysics values and intrinsic human values in accordance with the essence of humanity sciences [3]. In essence, the learning process is synergizing available concepts, solving problems, types of technology and the benefits, maintaining and improving products, being creative, making decisions based on the essence of humanity, and being aware of the impact and caring for humanity and the universe. It is the humans who must decide to create and utilize the technology products as human culture products at a level of civilization based on a message of Ki Hajar Dewantara that education in general is "producing superior human resources to make Indonesia and the world better; creating human resources who have awareness in order to be able to move the spirit of other humans; achieving prosperity based on organization of visual elements in such a way as to become an organic and harmonious whole".

5   Conclusion

The Indonesian nation is currently developing both in domestic and foreign aspects. Domestically, Indonesia is in the process of Ipoteksosbudhankam transition to become a strong nation that has independence, prosperity and justice. In terms of foreign perspective, the Indonesian nation is facing the global competition that is getting tighter and faster, in a condition where the mobility of investment and products from abroad are continuously increasing, regional and global manpower markets that become more open, and the process of interaction with global culture becomes increasingly high. To produce quality humans in this competition context, a more suitable approach is needed in LPTT, such as the holism approach, namely approaching problems with various knowledge perspectives in integrated fashion [10]. Such humans will boost and lead continuous efforts to achieve social justice which can be done by exploring the historical life of the nation (may be referred to as local wisdom) which is developed by using the appropriate technology to become the nation's asset both regionally and globally [11].

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