

Preliminary research on Lecturer Skill Development for Digital Transformation in Indonesian Academic Institution

Ully Asfari¹, Hawwin Mardhiana², Anfazul F. Azizah³, Noerma P. Istiyanto⁴, and Yupit Sudianto⁵

^{1,2,3,4,5} Institut Teknologi Telkom Surabaya, Surabaya, Indonesia
ully.asfari@ittelkom-sby.ac.id, hawwin@ittelkom-sby.ac.id,
anfazul.azizah@ittelkom-sby.ac.id, noermapudjiistiyanto@ittelkom-
sby.ac.id, yupit@ittelkom-sby.ac.id

Abstract. The literature has focused its attention on the relationship between digital learning and learning context in Indonesia. From this perspective, the lecturer also needs a development accompanied by digital transformations that enhance value creation. Times change requires lectures to increase their ability to share knowledge with students. The majority of students faced come from generation Z, where students have accustomed to the latest IT news. Submission of material using the latest media is easier for students to understand. This paper analyzes the conceptual framework of digital transformation aligned with the educational standard. According to the result, organizations to prepare their strategies according to skills development to respond to the challenges of digital transformation.

Keywords: Digital transformation, education, Indonesian University

1 Introduction

Technology makes a positive impact in all aspects including one in the field of education. Because technology is increasingly use in the educational environment. Educator expected to use digital tools to support classroom teaching in the learning process. Higher education is an educational institution that guides students towards the next level of education. The majority of universities have implemented ICT in each learning process based on academic curriculum standards. Digital learning can be a driver in the skills to develop digital organizations in the face of digital transformation prepare professionals to be able to handle digital competency issues as important skills.

With the increasing number of challenges in all aspects of work, the need for higher education graduates who have a variety of skills in interdisciplinary studies also increases (Oliver & Jorre de St Jorre, 2018). This requires universities to create students

to become sales professionals who are valued and competent, so they are able to use technology critically and creatively.

Educational institutions considered less dynamic at the time. It is seen from the teaching system, curriculum and assessment standards that require changes following the industrial era 4.0. Although universities in Indonesia already have a standard Curriculum Guide made by the government, this should be reviewed to be relevant to other universities in the present. Adaptation to technological changes is often called digital transformation, this condition is inevitable.

Teachers in Indonesia have three activities must be done, including teaching, research, and community service. Qualified lecturers not only fulfill these three obligations but also work and are more skilled in each of these points. In every point contained in the *Tridharma* of higher education, as educators it is also required to face digital transformation where teaching and learning, face-to-face teaching and learning can be equal or more effective by utilizing digital technology to be more flexible. The use of digital technology can make teaching and learning more flexible and lead to improved student skills in learning (Blaschke & Hase, 2015).

Digital learning requires practitioners who understand the importance of education in the local and global environment and who are passionate about exploring and using new technology as a catalyst for learning. Therefore, researchers will discuss how digital transformation can obtain higher benefits in education, and why it is needed, and what are the challenges to implementing it.

2 Literature Review

2.1 Digital Learning

Digital learning is a term that replace the e -learning which discusses the use of information and communication technology (ICT) in remote open learning. Digital learning is a technical solution to support teaching, learning, and learning activities (Suhnen, 2005) and digital learning can also the educational software, digital learning tools, online study programs or learning resource (Anohina,2005).

The application of digital learning makes students are more independent because the can study anytime and anywhere both online and offline without distance restrictions. Digital learning can be facilitate the learning process wider and varied. Digital learning technologies can enable students to connect theory and application more adeptly, quickly and facilitating the students sharing of knowledge.

2.2 Digital Transformation

Digital technology is one of the main triggers in economic development and almost people find out about digital transformation so quickly. This condition is unavoidable from technological changes that have reached all activities of human life, which makes the use of technology have a relatively short time. Projection of the World Economic Forum (Future if Work, 2016) five million jobs will be lost by 2020 due to changes namely by the presence of artificial intelligence, robots and nanotechnology, but not all jobs will be replaced by technology.

In some aspects, digital transformation takes place quickly in companies and organization including in education. New skills needs are a demand in overcoming challenges that arise in digital transformation. Trends in skills development are used to refer to individual characteristics, but in the opinion (G.Hui, 2014) a skill can refer to individuals and collectives (organization). In higher education, skill development is a goal students want to achieve in prepare for the future.

The development of skills and abilities of teacher is considered as strategic management to overcome digital transformation and industrial 4.0. This clarifies the importance of developing the skills of educators to enhance the potential for digital transformation in organization.

2.3 Indonesian Trends Learning Method

The higher education curriculum is a program to generate collection, so this program must ensure that qualifications are in accordance with the qualifications received in the *Kerangka Kualifikasi Nasional Indonesia* (KKNI). Description of learning outcomes in KKNI, the formulation of learning outcomes is included in one of the standards namely the Graduate Competency Standard call it *Standar Kompetensi Lulusan* (SKL). In the National Standard for Higher Education call it *Standar Nasional Pendidikan Tinggi* (SN-Dikti), learning outcomes consist of not attitudes, general skills, special skills, and knowledge. SN-Dikti, while the Higher Education SNG must be formulated by a study program forum that is in accordance with the definitions produced by the forum program.

There are four aspects in the curriculum guide, namely aspects of special skills, general skills, attitudes and knowledge. However, there are two aspects related to learning outcomes, namely aspects of specific skills and aspects of knowledge. These aspects are the selling points of students. Aspects of these aspects are made in accordance with the uniqueness of a study program, this becomes a differentiator. In this discussion the knowledge aspect is the main focus, because it is formulated by the relevant forum or association. As a limitation of this study, researchers took samples of knowledge aspects of the Information Systems Study Program. This study program uses ICT in each learning process. Researchers use a curriculum from the field of

Informatics and Computers published by *Asosiasi Pendidikan Tinggi Informatika dan Komputer* (APTIKOM). APTIKOM is an association of universities in Indonesia that has study programs related to information and computer family subjects (or better known as information technology).

The higher education curriculum is a program to generate collection, so this program must ensure that qualifications are in accordance with the qualifications received in the Indonesian National Qualifications Framework (KKNI). Description of learning outcomes in the IQF, the formulation of learning outcomes is included in one of the standards namely the Graduate Competency Standard (SKL). In the National Standards for Higher Education (SN-Dikti), learning outcomes consist of not attitudes, general skills, special skills, and knowledge. SN-Dikti, while the Higher Education SNG must be formulated by a study program forum that is in accordance with the definitions produced by the forum program.

2.4 New Trends Skill

The skills needed in digital transformation-based organizations refer to previous research conducted by SOUSA. In this research, an analysis of the results of the survey was conducted and produced skills that could be integrated into the organization and life of the community.

Table 1. Skill for organizations and education in digital transformation

Skills	Application
Artificial intelligence and nanotechnology	Intelligent software can perform in continual learning, AI include personalizing learning, evaluating the quality of curriculum and content also complement the teacher.
Robotization	The robot can be applied to education, industry and health. The benefits of using robots between can reduce labor costs and can carry out dangerous tasks that humans cannot do.
Internet of things	Low cost sensor networks, real time data collection, monitoring, decision making and process optimization and can be applied to all economic clusters
Augmented reality (AR)	Augmented reality is one of solution for classroom is an excellent way to provides educators and student with deep learning. AR makes classes more attractive and students more easily understand subject matter.
Digitalization	Digitalization can improving and transforming business process in organization.

Every skill for organization digital transformation has different effects to produce purposed skills, so the skills are analyzed with learning outcomes in accordance with KKNI and Aptikom to produce purposed skills. The process of analyzing skill data

needed to support curriculum standards using a Likert scale. Discussions and surveys conducted with respondents from the lecturers who had more than two years of teaching experience. The results obtained used in research related to opportunity for new disruptive business and digital transformation organizations.

3 Problem State

The current state of higher education in Indonesia already have a Indonesia National Qualifications Framework (Kerangka Kualifikasi Nasional Indonesia or KKNi) written in Presidential Regulation Number 8 of 2012 and Law Number 12 of 2012 about Higher Education. KKNi is a statement of the quality Indonesian human resources whose qualifications are based on the level of ability stated in the formulation of learning outcomes.

Higher education curriculum (Kurikulum Pendidikan Tinggi or KPT) is a program to produce graduates, so the program created should guarantee that graduates have qualifications equivalent to the qualifications agreed upon in the KKNi (KPT 2016).

The stages in the preparation of the higher education curriculum in Indonesia are divided into three phase, namely the curriculum design phase, the learning design phase, and the learning program evaluation phase.

a. Curriculum design

In this phase there are three parts, namely the formulation of graduate learning outcomes (Capaian Pembelajaran Lulusan or CPL), Formulation of Courses, and Course Preparation (curriculum framework). In the preparation of graduate learning outcomes section, it includes determining the profile of graduates, determining abilities derived from the profile of graduates and finally formulating CPL.

b. Learning Design

At this phase the activities formulate Subject Learning Outcomes (Capaian Pembelajaran Mata Kuliah or CPMK), Semester Learning Plans (Rencana Pembelajaran Semester or RPS), learning process until assessment of learning

c. Learning Program Evaluation

Evaluation of study program activities in carrying out learning activities is used as a measure of the success and improvement of the quality of learning or curriculum development in majors.

4 Purposed Skill Analysis

Purposed skill obtained from the result of the count of weight analysis of new skills based on CPL interests in accordance with the KKNi and APTIKOM curriculum and calculated according to the interest of each topic on the new trend skills in digital

transformation. The result of the analysis of researches, purposed skills analyzed based on learning outcomes of information systems study programs.

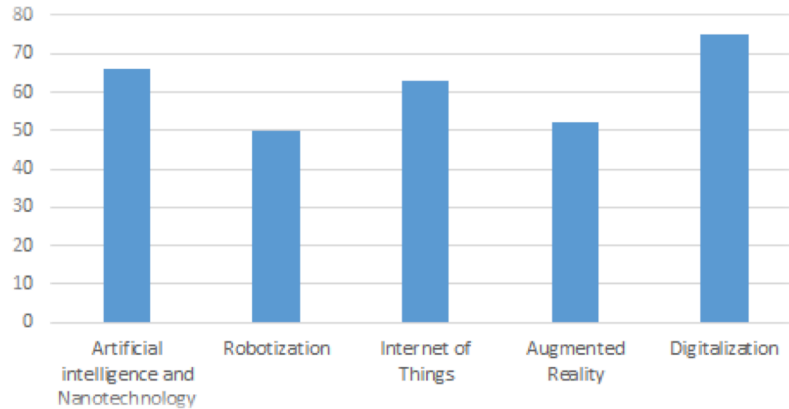


Fig. 1. Skill Analysis

From the result of analysis, the researchers showed that skills most related to learning outcomes in information systems study programs were digitalization, artificial intelligence and nanotechnology, internet of things, augmented reality and robotization. Each learning achievement of the study program is different so the result of the purposed skill are also different.

5 Research Conceptual Framework

There is a proposed conceptual framework related to skills in digital transformation. Research framework based on analysis of learning outcomes (CPL) from KKNi and APTIKOM. This is a consideration of the lecturer in calculating the achievements of the skills aspect. To develop the application of digital information in the curriculum of Indonesian universities. From this study, the proposed framework is useful for determining the effects of digital transformation on educational institutions.

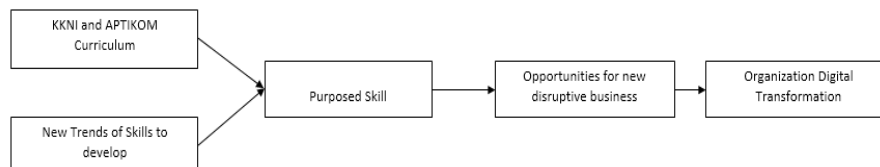


Fig. 2. Research Conceptual Framework

From the research conceptual framework can analyze the relationship of purposed skill to opportunity for new disruptive bussiness.

6 Conclusion and Future Work

The purposed model's contribution to determine the effect of purposed skill on opportunity for new disruptive business and organizational digital transformation. The conclusion of this preliminary research is the relationship between information systems curriculum according to the KKNi and APTIKOM on skills for digital transformation. According to our analysis, the skills of curriculum are digitalization, artificial intelligence, Internet of things, augmented reality and robotization. From the purposed skill, a research conceptual framework can be formed which will be analyzed in further research.

References

1. Oliver, Beverley & Trina Jorre de St Jorre.: Graduate attributes for 2020 and beyond: recommendations for Australian higher education providers. *Higher Education Research & Development*, 37(4), 821-836 (2018).
2. Blaschke, L.M. & Hase, S.: Heutagogy: A holistic framework for creating 21st century self-determined learners. In: M.M. Kinshuk & B.Gros, *The future of ubiquitous learning: Learning designs for emerging pedagogies*. 24-40. Springer, Heidelberg (2015).
3. Anohina, Alla.: Analysis of the terminology used in the field of virtual learning. *Journal of Educational Technology & Society* 8(3), 91-102 (2005).
4. *The Future of Work*. World Employment Confederation (2016).
5. G.Hui.: How the internet of things changes business models, *Harv. Bus. Rev.* (2014).
6. *Kerangka Kualifikasi Nasional Indonesia (KKNi) Bidang Ilmu Informatika dan Komputer. APTIKOM*. 2016
7. *Panduan Penyusunan Kurikulum Pendidikan Tinggi*. Kementerian Riset, Teknologi dan Pendidikan Tinggi Direktorat Jenderal Pembelajaran dan Kemahasiswaan Direktorat Pembelajaran, (2016)
8. Sousa. Maria José, Rocha. Álvaro.: Digital learning: Developing skills for digital transformation of organizations. *Future Generation Computer Systems* 91, 327–334 (2019).