Strengthening Capability in the Learning Profession of Education Technology at State University Of Malang

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Migration towards capabilities from the era of competence influences the design and management of learning ecology. This is done through the ability of transdisciplinary conditions from various competencies to support core competencies. The learning process of the Educational Technology Profession (TEP) course at Malang State University (UM) is designed and managed using learning capacity building. The purpose of this study is to look at 1) how to strengthen the ability of students to work by creating innovative ideas that can be improved and are related to the profession and 2) how students act as the originators of ideas in the process of constructing knowledge and abilities as a form of reinforcing learning outcomes. The method used in this study is survey methods to determine the response of the research subjects to get a picture of the quantity and quality of students working with developing creative ideas. The research result showed that the learning process strengthens capabilities and supports the UM curriculum and builds learning outcomes.

INTRODUCTION

The manifestation of changes in the learning system is the migration from the era of competence to the era of capability development. This ability requires the design and organisation of learning. Capability development is not limited to developing competencies in one particular profession. It is more towards the development of competencies that are additional development of certain competencies that support the profession into a single scientific whole. (Deneulin, 2006; Martha C. Nussbaum, 2011; Sen, 1993, 2004, 2005) describe capabilities as competencies with the addition of other competencies to build complete core competencies. (Staron, 2011; Sulton, Adi, & Susilo, 2018) Developing learning design as learning framework is necessary for developing capabilities.

(C. M. Reigeluth, 2013; C. Reigeluth, Watson, & Watson, 2008) describes learning, before education in the 21st century, of industrial models as paradigms. Standardisation and mass production of manufacturing are highly recognised. The learning process of TEP professional subjects have been influenced by recognition and tendencies about individual knowledge and accumulation. The learning process of students with the same content and skills is based on rigorous curriculum guidelines with a specified time frame. Strict learning conditions based on several studies (Adams and Engelmann, 1996; Magliaro et al., 2005) greatly affect learning outcomes.

Research produced by (Praherdhiono, Adi, Prihatmoko, & Oktaviani, 2019; Praherdhiono, Sulton, Lioe, & Hammad, 2018) shows the tendency of UM students to have different styles and characteristics of learning in each class year. The differences found were based on the survey results from student input each year. The difference is reflected in attitudes, work habits, motivation and other aspects. The learning process requires a way to overcome the differences found in each class. (Akhtar, 2016; Serrat, 2017) state that learning experiences must always be enriched from internal and external learning processes. For this to happen, synergy and organisation, people, knowledge and technology are needed in the learning process (Serrat, 2017). Determination of learning settings must respect the role played by students in learning activities. This process shows an overview of learning strategies that will accommodate learning in achieving its goals.

Serrat (2017) states learners must recognise the importance of giving motives (reasons), facilities, and opportunities for learning: (i) the motives/reasons for being "*why*?", can be in the form of goals and reasons for learning outcome; (ii) that means to become "*how and what*?" can be in the form of methods, models, and competencies needed; and (iii) the chance to become "*where and when*?" can be in the form of space for learning outcome.

(Akhtar, 2016; Yeung, 1999) designed a learning organising framework to develop capabilities. Yeung (1999a) within the framework stated there are six keys to capability development, (1) there are four learning organisations: competency acquisition, benchmarking, experimentation, and continuous improvement; (2) the effectiveness of the learning organisation is seen from its suitability to the goals, content and characteristics of students; (3) students who have different learning styles have different performance activities; (4) learning organisations not only provoke creative ideas but also actualise broad ideas to blend between disciplines (transdisciplinary); (5) learning organisations must accommodate the characteristics and learning difficulties of each student including those with disabilities; (6) specific learning organisation management practices can be used to develop capabilities.

Including differences in the character of learning organisations in each individual is very important in learning. (Kim & Bateman, 2007; Truong, 2016) explains that students have different characteristics and ways of learning. Some of them can understand the material quickly through pictures. However there are also texts and readings. There are even students who can understand the theory well and others may have to try to learn through experiments and concrete examples. (Praherdhiono, Adi, & Prihatmoko, 2018; Truong, 2016) In the learning process students get an understanding of different learning styles and there must be an offer and means to design and provide interventions according to individual needs. For example, in knowledge of styles they allow for more confidence in learning and optimise their learning pathways (Chang, Hung, & Lin, 2015; Grebenev, Lozovskaya, & Morozova, 2014; Herod, 2004).

(Yeung, 1999) Figure 1 illustrates the *typology of learning organisation type* for capability development, in the topology it is depicted from the four organising learning *experiments*, *competency acquisition*, *bencmarking*, *and continuous improvement* combined with exploration and exploitation. There are two sources of learning that become a large dichotomy, namely direct experience and learning from the experiences of others. (Deneulin, 2006; Yeung, 1999) explain the difference between exploration and exploitation. Exploration refers to the exploration of experiments from new competencies, technologies and paradigms, while exploitation is more towards the expansion and refinement of existing competencies, technologies and paradigms.
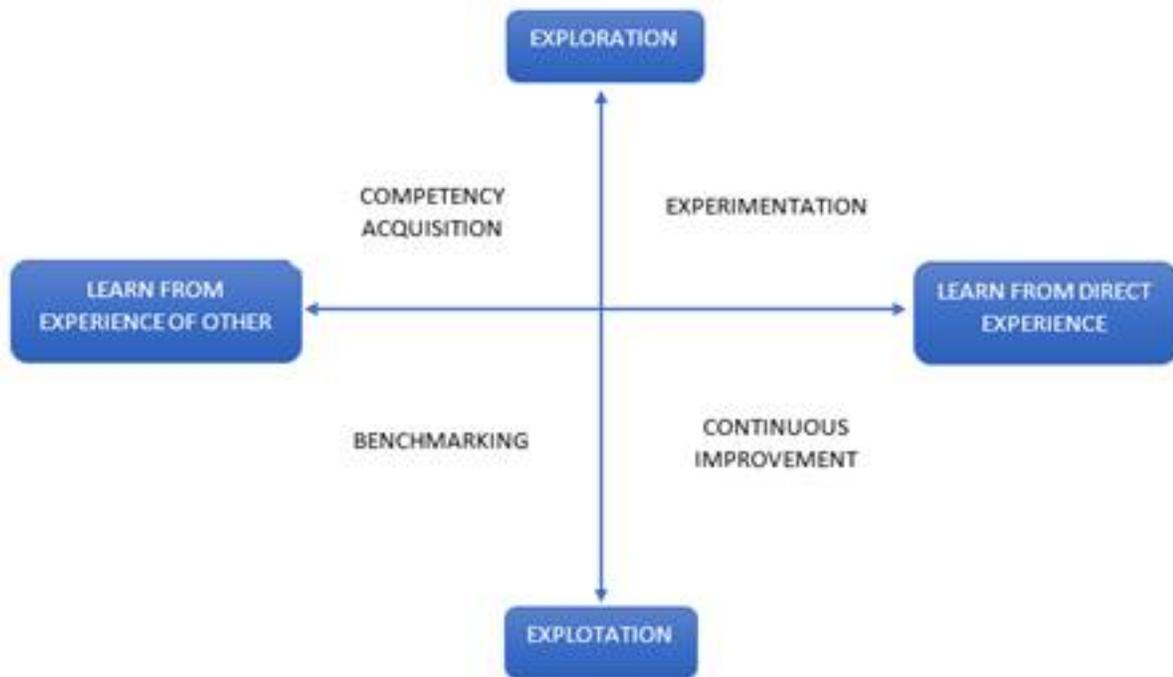
Figure 1. *Typology learning organization type*

In practice (Yeung, 1999) describes three types of learning organisations and provides a good framework for exploring capability development. The framework works to develop capacity. The resulting capability is to become an innovator, competent worker, comparison, and improvement expert. In detail the four learning organisations will describe four different ways to produce capabilities. The results of experiments and the acquisition of the most powerful competencies are pushing for authenticity, innovation, and uniqueness.

(Staron, 2011) presents four key concepts relevant to capability development: (1) the era of knowledge as an environment; (2) learning ecology as a metaphor; (3) philosophy based on strength as thinking patterns; (4) business policies as actions. The era of knowledge as an environment has reflected when students can strike a balance between work, study and understanding. Adaptation of learning ecological metaphorical that can immediately enhance understand what is needed and doing in development capabilities.

 Strengthening capabilities in learning process of the educational technology profession at UM is very necessary as described by several researchers (Deneulin, 2006; Martha C. Nussbaum, 2011; Martha Craven Nussbaum, 2001; Sen, 2004; Sulton dkk., 2018) about capabilities like competencies with the addition of other competencies to build complete core competencies. Strengthening capability claims that the importance of people and humanitarian aspects can reinforce the importance of business imperatives (Staron, 2011). (Staron, 2011) also explains

capable people are people who are capable and have confidence in their ability to make effective and appropriate decisions and actions. In addition they can describe their competence, can live and work effectively with others. They can continue to learn from experiences as individuals and as people to connect with others to greet diverse communities. Ministerial rules described the main functions of the educational technology profession in detail and clearly. In addition to the functional position of a learning technology developer, the career choice options for an educational technology graduate can be accessed on the following page https://education.ufl.edu/educational-technology/career-options/ as an option to add employment information as an educational technologist.

METHOD

Research design

The method used in this study uses survey methods to determine the response of the research subjects to get a picture of the quantity and quality of students working with developing creative ideas. Objects that can be corrected will be related to the condition of students in acting as individuals who have the creation of ideas as a form of knowledge construction. Previous research conducted is on the construction activities of students' knowledge. The construction focuses on the effective exploration of the application of learning strategies and technology design as a tool to improve the learning process. Specifically, this research is to see how students build constructions of these abilities and perceptions to be associated with TEP practice on professional knowledge.

Given the importance of a sustainable idea in the process of knowledge construction, it is very necessary to explore the quantity and quality in the idea creation process. In addition, it is better if the construction of knowledge in the education technology profession increases. The process of constructing knowledge by instilling a sufficient understanding of the development of the idea process is related to the role of these ideas for work and knowledge. This shows that as they engage in the practice of knowledge construction, students become more inclined to explore and discuss new ideas. Not only as an individual mental construction but also advancing personal knowledge as a subject that can be improved to advance the knowledge of society.

Respondents

The respondents in this study were students who took the TEP profession lecture in the TEP department of the Faculty of Education, Universitas Negeri Malang. The total number of students is 92 people and they were divided into three classes. In general, Indonesian and Asian culture encourage more didactic pedagogy and the learning process of the university concerned also has a tendency to only emphasise understanding of concepts. Still often the learning process

is only by reading from textbook knowledge. However, in this particular course, learning activities construct pedagogical knowledge using innovative pedagogy to encourage student capabilities in the creation of knowledge and learning outcomes.

Research Context

The main objective in this research is to strengthen and construct the capabilities of the TEP profession as a Learning technology. The Ministry has elaborated on the profession or Learning Technology Developer (PTP) having the fundamental task of analysis, design, production, implementation, control, and evaluation for learning. More broadly an educational technologist has career choices that are registered at https://education.ufl.edu/edukasi-technology/career-options/. This is a challenge that will be faced by TEP graduates in the future. From this basis, building collaborative construction of knowledge in an environment that is supported by technology as a tool for discussion. Technology is used as a collaborative solution and discussion room for students to be actively involved in building their group's knowledge construction. The learning process lasts for 18 weeks (in one semester), the learning organisation is divided into two equal phases using part time as a dividing point for midterms and final examinations to check performance. Throughout the semester, the most important thing is to solve the problem of the TEP profession by self-identification of students' own interests.

RESULTS AND DISCUSSION

Learning Organization in Educational Technology Professional Course
In general, lecturers often do learning activities based on the behaviorism paradigm. Lecturers direct students with their own experience and what has been done by parents or predecessors. Pedagogical organisational strategies carried out by lecturers are usually in the form of stimuli, responses, and reinforcement. The organisation is usually known as programmed or structured learning. Learning Organisations began to shift to the development of audiovisual media. One form is a video tutorial that is programmed. Technical tutorials are a step-by-step form of learning, following instructions, practical training, providing technical reinforcement. Strengthening techniques aim to provide more experience than just discovery activities, where students find questions rather than answers. The next audio visual technique is as a form of direct learning, which is written based on empirical methods for learning in small groups, but provides constant and fast interaction between students and lecturers.

In general, behaviorism-based technology shows that learning runs well and makes it possible to achieve the achievement of dramatic test gains through careful control of the contingencies between stimulus, response, and consequences, as claimed. A thorough analysis of learning tasks, precise specification of objectives, division of content into small steps, eliciting active

responses, and feedback giving them responses is a successful formula, at least for certain types of learning objectives. In addition, the planning process needed to produce this kind of learning gave birth to a larger planning methodology now known as learning system design (De Smet, Schellens, De Wever, Brandt-Pomares, & Valcke, 2016; Magliaro, Lockee, & Burton, 2005).

Analysis of TEP profession students

An understanding of the Educational Technology profession from the perspective of students of Educational Technology is very broad. Based on the results of a survey of 3 classes taking courses in the educational technology profession, each class showed different variations of approximately 92 students resulting in very varied views.
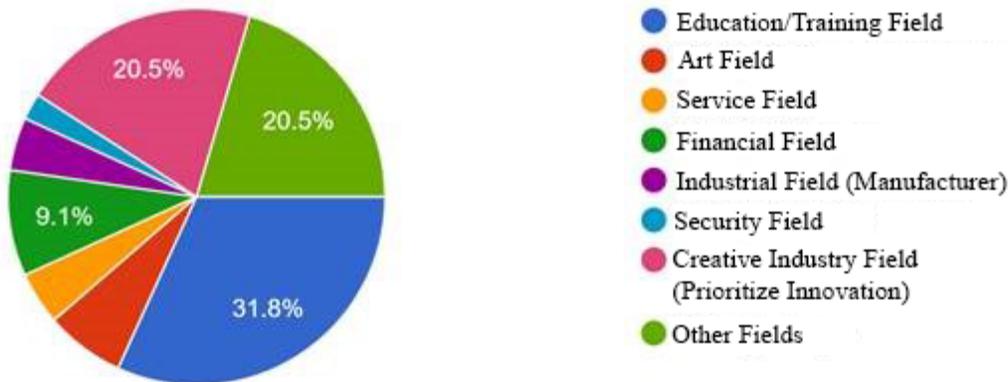

Figure 2. Distribution of TEP student professions

Students provide information even though learning is done at TEP, but in general students do not want to be locked up in professions in the field of education.
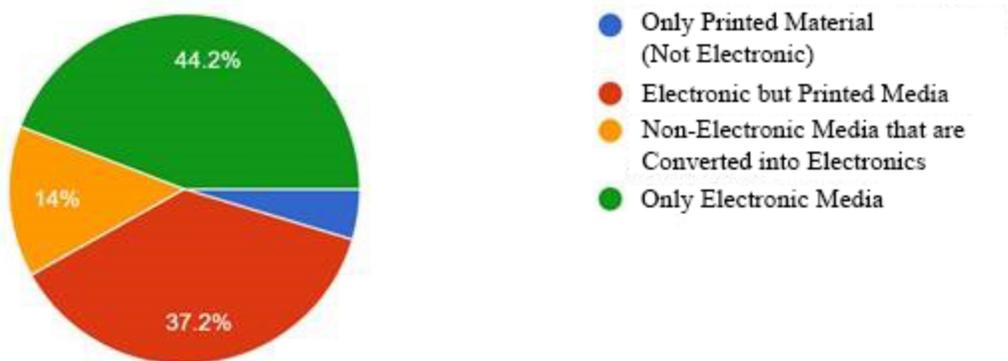

Figure 3. Distribution of media needs for TEP students

Professions in the context of education and learning are identified as generic abilities (core) (Januszewski & Molenda, 2013). However, the current form of the profession is considered non-linear and non-routine, more intuitive, opportunistic, and always requires innovation. For

example, if there are professions, Education Technology will reflect a generic capability (capable) when they are in the environment: (1) Learning and Knowledge, (2) Model development activities, (3) Facing educational problems. By quickly learning new skills, the new skills can be applied and existing knowledge to solve new problems, as based on expertise and *High Order Thinking* patterns, (4) Can solve problems and can construct ideas that make sense in new contexts, (5) Able to maintain a balance between productivity and creativity, and, (6) Able to collaborate through face-to-face and virtual environments.

So that the education technology profession will become a learning technology development professional group, if you look at the Educational Technology profession, it will have a group with other professions in learning technology developers. Science can come from information science, communication, engineering and psychology.

Professionals seen in the field of education are graduates who are ready to accept the challenges of working and learning in a modern environment to build and sustain ongoing environmental shifts including: (1) Capacity for encourage sharing and maintaining, (2) Capacity to collaborate, (3) Implement direct professional development, (4) Flexible and responsive leadership, and (5) Aim in the context and concepts of the company environment.

Educational Technology students are representatives of Generation Z who have a learning ecology construction that is different from previous generations. Construction Learning ecology that develops in education is an effective metaphor for giving meaning to the fundamental concepts of life (Hays, 2005). Learning about ecology includes a dynamic system idea in the learning process. Metaphors which can directly enhance the construction of understanding of something that is needed in developing abilities in the field of education in the Knowledge Age.

Learning about an ecology of learning is understanding dynamic, adaptive, and diverse conditions. An exploration of the Professional metaphor dimension the development of the Life Based Learning curriculum model is assessed. The LBL curriculum offers a choice of ability development and provides freedom of learning. In LBL find ways to learn to get the right solution. More importantly, the ecological construction of learning is a metaphor for drawing our attention to a world of intuitive, caring and responsible views.

Learning Ecology as a professional metaphor for developing abilities is (Staron, 2011): (1) This approach is not about accuracy or predetermined strategies for doing something. Not a prediction, but it is anticipatory, (2) This is a permissive framework where there may be tension and irritation because there are no clear answers, (3) Some things are a mistake and this will help to make an idea of change, (4) Nothing more than an estimate of accuracy, (5) Lack of clarity is

power. Lack of clarity is the right concept that provides a framework for understanding chaos, (6) Self-organisation takes place in an ecology, but there may not be a satisfactory explanation of where the organising pattern originated.
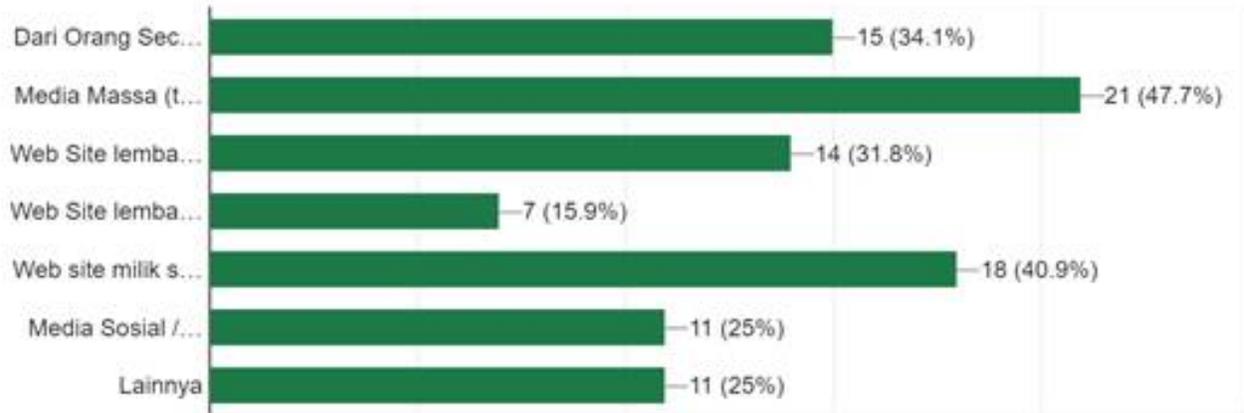

Figure 4. Application data that affects students

Scientific paradigm and knowledge are used as a basis in the field of education. The paradigms that emerge in technological science will influence the emergence of various changes based on changes in assets or strengths of approach for individuals and organisations (companies). Capability development has a focus on collaboration in identifying and realising a good work ethic. Next invest in the problem solving process (Staron, 2011b). Strengthening capabilities in the field of science by identifying the main discipline of positive psychology that supports the theory of strength and orientation of students in development based on the capabilities of students.
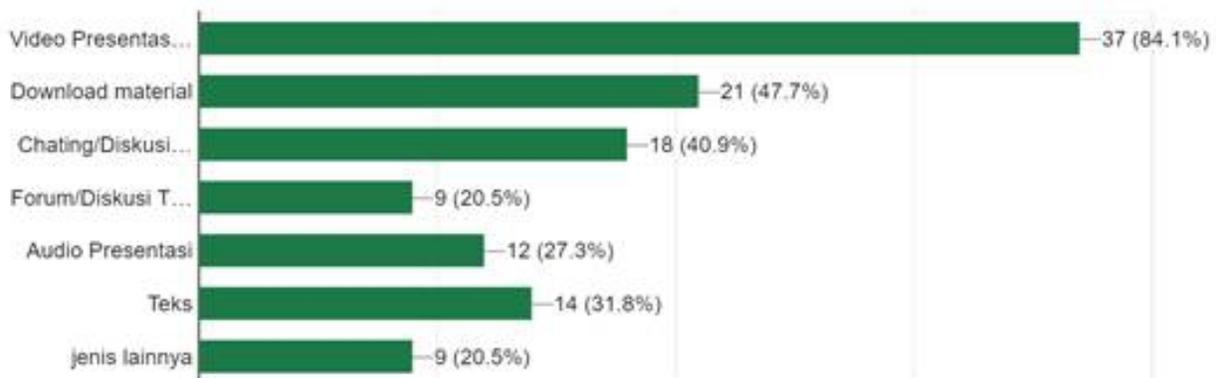

Figure 5. Data types of digital media student desires

In general, students rely on video media to construct knowledge understanding to develop capabilities. Strengthening capabilities in lectures in the educational technology profession is an

evolution based on awareness, relationships. Not avoiding and willing to devote energy to the welfare of others. The concept of evolution with life as explained in positive psychology is very well suited to having a connection in the ecological construction of learning metaphors.

Learning Ecology in the TEP Professional course

The capability in the conception of students is not actually creating new abilities, but rather optimising the potential of individuals in thinking in a transdisciplinary community. When meeting with several students as respondents students explained about the capability of innovation, that gave rise to the idea of how to learn from one's mistakes in the professional world and how this could be quite easily understood and implemented. Learning that has been done so far is learning in the form of class or group organisations, which barely supplies anything for each individual to learn. In this condition, looking at the profession in the world of work is the view of thinking of each individual. It is undeniable that learning in the organisation, whether in the form of groups or classes, occurs through individuals and it would be mistaken to conclude that learning through an organisational framework is nothing but the cumulative outcome of the learning of its members or individual individuals (Fiol and Lyles, 1985). Capability is built in line with each individual student to develop a personality, personal habits, and trust themselves with the views and ideology organisation. The capability development will be a meaningful profession and undergo a color change when there is a change to a member 's leadership, but the potential retention of thinking organisation will retain some of the behaviors, mental maps, norms, and values believed by every individual.
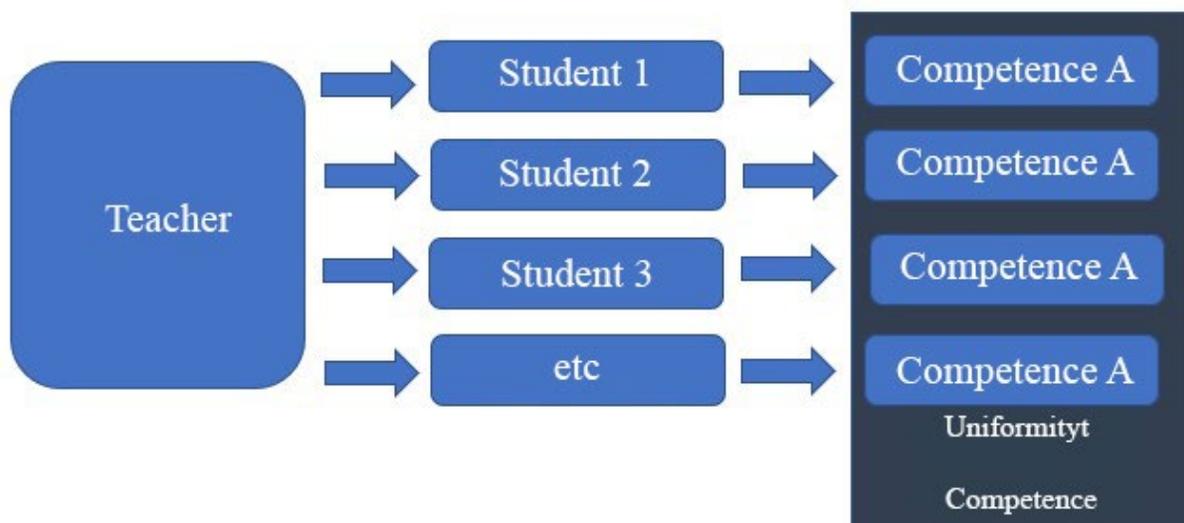

Figure 6. Efforts of lecturers in learning to build the same competencies

Students at Malang State University, do not yet have a comprehensive understanding of transdisciplinary capability thinking. This view of learning in professional organisations has some similarities with aspects of good bureaucratic development. The creation of systems and procedures that are strong enough to overcome the professional thinking of each individual (Yeung, 1999b). As an initial activity lecturers need the scope to build a professional world and act as managers who function to build learning organisations that have a focus on individual learning and organisational learning. Learning the various observations have not led to the construct the capabilities of individuals and they acquire new competencies that occurs when individuals within the organization advance the knowledge of her through education, experience, or experiment personally. Activities thinking about the profession are not based on systems and cultures to transfer it to other individuals.

The excavation of professionalism is not based on the concept of profession, but is approached by the emergence of the desire to have a very general profession through the perspective of ideals. The excavation of professionalism is the basis for focusing the development of the capabilities of Malang State University students. Capability that has been successfully portrayed is a need for students to face life by searching for knowledge from within and outside the current their discipline. Students chronologically explain the changes in constructing their ideals based on their thinking *timeline*. But it cannot be denied that ideals do not always appear when they are still children.

Difficulties that arise are the perspective of lecturers and students in looking at the profession. The development of ideals is actually the development of individual thought patterns that are influenced by learning in the organisation. Organisations can be managed as classes, family, friends etc. This shows how complex the capability learning is at handling the organisation. One individual in reality does not only have one learning organisation.

Organiser early learning in a community needs to have a leader/manager who can design culture and a system such that students are constantly challenged to help realise the organisation's future through a scientist perspective. Regular Learning in the capacity of the organisation is to gain insight from his own experience, the experience of others, and to modify the way it works in accordance with such insights (Shaw and Perkins, 1991).
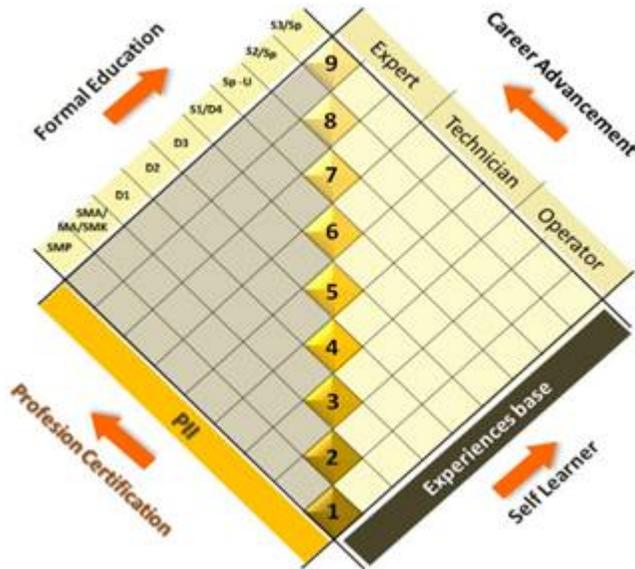
Figure 7.   The Concept of KKNI (Santoso, 2011)

The Indonesian National Qualification Framework (KKNI) is one step towards realising the quality and identity of the Indonesian nation in the human resources sector which is linked to the national education and training system development program. Each level of qualification covered by KKNI has meaning and equality with the learning achievements of every Indonesian worker in creating quality work and contributions in their respective fields of work.
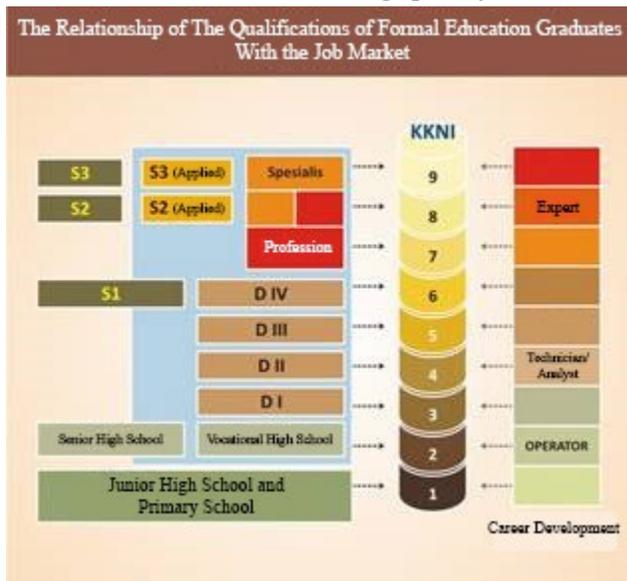

Figure 8. Division of Competency Levels (Santoso, 2011)

KKNI provides nine qualification levels, starting from 1st qualification as the lowest qualification and 9th qualification as the highest qualification. Determination of levels 1 to 9 is done through a comprehensive mapping of labor conditions in Indonesia in terms of the producer *(supply push)* and the user *(demand pull)* labour. The descriptors at each qualification level are also adjusted to take into account the condition of the country as a whole, including the development of science, technology and arts, the development of sectors supporting the economy and people's welfare such as industry, agriculture, health, law, etc., as well as aspects development national identity reflected in Unity in Diversity, namely the commitment to continue to recognise the diversity of religion, ethnicity, culture, language and art as a distinctive feature of the Indonesian nation.

CONCLUSION

Capability strengthening activities support the curriculum model of Malang State University. The research activity is a series of in-depth studies of methods of developing student capabilities through elements of the Education Technology profession that are carried out in a transdisciplinary system. The research should get a complete picture of the capability to be realised in *Life-Based Learning* based on the desired competencies in the Education Technology profession. Strengthening capabilities is one step to anticipate changes in the profession from the era of competence to the era of capability. Organising learning is one way to make fundamental changes in the learning paradigm.

Strengthening capabilities in the curriculum is able to lay the foundation of capabilities as the achievements of graduate learning with orientation: 1) On the needs or specialisation of students towards occupation that will become their passion. 2) The creation of independence in determining the skills to be possessed in accordance with their area of expertise is this matter about the study of the learning technology profession. 3) Creating the ability to apply and create areas of expertise as a standard outcome of learning outcomes. 4) Creating a lifelong learning ability, to acquire and expand knowledge and apply it, as a form of continuous improvement of life skills.

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