

Reflective Learning for Sustainable Development

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Abstract—We experience continuous changes from time to time. This process will result in new challenges and problems which in turn can threaten the sustainability of life. For our life to be sustainable, we must have a critical spirit and the ability to make a decision to undergo changes which are more humane. Education can play a critical role to develop these competencies. This paper will discuss the role of education for sustainable development by using holistic and reflective learning theories.

Keywords—reflective learning, sustainable development

I. INTRODUCTION

Sustainable development is a response to current development problems and unbalances. Development is considered as having brought about unbalances to environmental norms in the world and has resulted in social inequality in society. The excessiveness of development to pursue economic prosperity has swerved from the true objective of development, which is to improve the human race. As Capra [1] has pointed out, in the twentieth century (up to the present) we have faced a very serious challenge. In the economic field, quite serious inequality and injustice have been happening. The gap between *the haves* and *have-nots* is getting wider; rich countries exploit poor countries more and more. In social life, man is considered, treated, and steered as a robot which has no soul. So is the case in the medical field, man is wholly treated as having body and soul. The same applies to the excessive use of technology which has made it possible to exploit fossil-derived fuels and quite serious environmental pollution. According to Capra, those varieties of problems resulted from the use of Descartes and Newtonian paradigm. According to that paradigm, this universe is not really different from a giant machine which consists of parts which are not inter-related, which are able to be controlled.

The paradigm has colored varieties of fields and is used in solving the problems we are facing. As a result, imbalances happen in life in this universe. Life is ruining.

Sustainable development is the world agenda to respond to the above problems. At the early stage, this agenda is focused more on the environment and economy. In the long run, this agenda becomes wider in its scope, not only in the environmental and economic problems but also in the social [2]. There are at least three orientation varieties in the social development which try to change the narrow perspective of economic development, i.e. a generic noneconomic social designation that uses terms such as “social development,” and “social progress.”; human development as opposed to economic development: “human development,” and “human well-being: justice and equity: “social justice,” “equity,” and “poverty alleviation.” [2].

To realize a life which is more equitable, peaceful, and sustainable, all people and communities must have the ability to reflect on their own actions, taking into account their current and future social, cultural, economic, and environmental impacts, from a local and a global perspective. Therefore, the following competencies are needed: systems thinking, anticipatory, normative, strategic, collaborative, critical thinking, self-awareness, and integrated problem-solving [3]. This is where education has a critical role to play. Education for Sustainable Development (ESD) is about shaping a better tomorrow for all [4].

However, not all kinds of education support sustainable development [3]. On the one hand, there is a tendency nowadays that education is considered as an instrument of economic development only. It has to contribute to individual and national wealth and assist individuals to make successes of their lives [5,6]. Education which emphasizes only economic development will increase unsustainable consumption patterns [3]. Besides, the existing education puts more emphasis on formal education and does not give enough attention to non-formal and informal education, and it even separates one from the other. Meanwhile, education for sustainable development cannot be solely left to formal education. In general, educational processes occur outside formal education

and almost 83% of the process of learning in the workplace in general occurs through informal learning [7]. Therefore, a new approach to our educational process – formal, nonformal, and informal – is a necessity. This paper discusses such an approach by using holistic and reflective learning theories.

II. HOLISTIC LEARNING

In the 1970s there arose an awareness of the need to posit education as a unified whole unseparated from one's life. Education is not only for life, but education is the life itself. An acknowledgment of all learning processes happening in society, both non-formal and informal learning, is one of the forms of awareness. The National Education Act of 1999 [8] defines formal, non-formal, and informal learning as follows.

- Formal learning occurs as a result of experiences in an education or training institution, with structured learning objectives, learning time and support, leading to certification. Formal learning is intentional from the learner's perspective.
- Non-formal learning is not provided by an education or training institution and typically does not lead to certification. It is, however, structured (in terms of learning objectives, learning time or learning support). Non-formal learning is intentional from the learner's perspective
- Informal learning results from daily life activities related to work, family or leisure. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional but in most cases, it is non-intentional (or "incidental"/random)

UNESCO posits the three learning processes in one unseparated whole unit. A number of policies have been made to realize the agenda. However, at the macro level of learning processes, there has not been a certain formula of how the three processes of learning are related to one another. Yang's view [9] about learning processes can give an illustration of how learning processes run holistically.

Based on the type of knowledge perspectives, Yang [9] writes that there are three types of knowledge, i.e. explicit, implicit, and emancipatory knowledge. Yang defines *knowledge* as human beings' understanding of reality through mental correspondence, personal experience, and emotional affection with outside objects and situations. The three kinds of knowledge are inter-related as one holistic unit. *Implicit knowledge* is personal, context-specific familiarity, or the familiarity that has yet to be articulated, and therefore hard to formalize and communicate. *Explicit knowledge* refers to clear and certain mental apprehension that is transmittable in a

formal and systematic format. *Emancipatory knowledge* defines one's view about what the world should be, and it is the product of one's efforts to seek freedom from natural and social restraints.

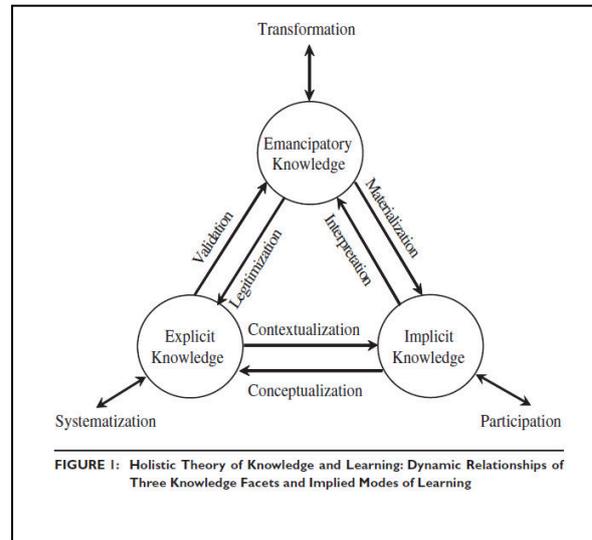


Fig. 1. Holistic Theory of Knowledge and Learning: Dynamic Relationship of Three Knowledge Facets and Implied Modes of Learning.

When knowledge is related to the type of learning processes, implicit knowledge is learned more in informal learning processes, explicit knowledge is learned more in formal learning processes and emancipatory knowledge is learned more in non-formal learning processes. The three types of learning processes cannot be separated from one another, as Yang [9] writes that knowledge is created and transformed through the interactions among explicit, implicit, and emancipatory knowledge. This interaction results in nine modes of learning, i.e. participation (the process of knowledge acquisition through direct personal experience), conceptualization (the process of developing implicit knowledge to be explicit knowledge), contextualization (the process of implementing explicit knowledge into a specific context), systematization (the process of constructing explicit knowledge logically and systematically), validation (the process of investigating values – an underlying belief and which is valuable and important based on explicit knowledge), legitimization (the process of justifying explicit knowledge based on emancipatory knowledge), transformation (the process of converting old schemata into a new form), interpretation (the process of valuing direct experience), and materialization (the process of transferring emancipatory knowledge into implicit knowledge).

Furthermore, Yang [9] writes that learning processes occur as a result of the interaction among the three types of knowledge. Based on this valuing, Yang defines *learning* as the process whereby

knowledge is created, acquired, transformed, converted, or utilized in a different context from its origin.

- *Knowledge creation* is a learning process where new understanding (in either of three facets) about reality is formed.
- *Knowledge acquisition* learning process where a learner gains knowledge from another source in the original form.
- *Knowledge transformation* refers to a process where the learning outcome is a new format of knowledge.
- *Knowledge conversion* refers to the exchange from one knowledge facet to another.
- *Knowledge utilization* can also be viewed as learning when a learner applies it in a different context from its original and gains new understanding about the problem facing him or her.

III. REFLECTION AS THE KEY TO LEARNING PROCESS

The importance of reflection in learning processes was put forward by Dewey at the beginning of the 20th C. Dewey [10] states that when someone cannot value new experience because there is no compatibility between the existing experience and the new one, he or she is required to search for extra information to cope with the incompatibility. This process is called reflection. Dewey writes “. . . *to reflect, means to hunt for additional evidence, for new data, that will develop suggestion, and will either, as we say, bear it out or else make obvious its absurdity and irrelevance*”.

In the context of valuing experience, Jarvis [11] posits reflection as the key to learning processes. According to Jarvis, when an individual has the experience, he will not automatically do a learning process. When an individual does a reflection on the experience, a learning process begins to occur. On the basis of this understanding, he classifies learning processes into two, i.e. a) *Non-reflective* learning, which consists of preconscious learning, skill learning, and memorization. Preconscious learning is a learning activity where an individual unintentionally understands the process he or she does holistically. *Skill learning* is a form of learning which emphasizes only the acquisition of psychomotor skills by way of watching and imitating. *Memorization* is a form of learning which emphasizes the process of memorizing information by way of storing, memorizing, and recalling. b). *Reflective learning* consists of *contemplation, reflective skill learning, and experimental learning*. *Contemplation* is the process of thinking about the experience and drawing conclusions without referring to wider social reality. *Reflective skill learning* is the process of learning a

certain skill followed by investigating the concept or theory underlying it.

Viewed from the learning theory perspective, Mezirow [12] states that the concept of reflection of Dewey's and Jarvis' is limited to instrumental learning processes, i.e. reflection upon solving problems deductively. According to Mezirow, this concept does not distinguish explicitly the function of reflection upon the content of a problem or problem-solving processes from the function of reflection upon premises. The reflection upon premises will result in the change of paradigm. Mezirow [12] states that “Reflection is the process of critically assessing the content, process, or premise (s) of our efforts to interpret and give meaning to an experience”. Mezirow [13] mentions content and process reflection as a reflection in action, and the reflection upon all of the three is called retroactive reflection.

Despite reflection varieties of orientations, Ryan [14] views two basic similarities which become the key to reflection, i.e. *first*, making sense of experience in relation to oneself, others and contextual conditions, and *second*, reimagining and/or planning future experience for personal and social benefit. In line with this point of view, Fullana [15] views learning as a process of recycling starting from problematic action or when someone experiences a destabilizing situation and then is trying to understand the action or experience, doing investigation in order to understand the cause, finding alternatives and making an action plan, and then take action, analysis, and evaluation.

IV. REFLECTIVE LEARNING MODE

In the context of learning processes, Boud and Walker [16] consider that reflection takes place in two learning events, i.e. reflection in action and reflection on action. Reflection in action is the process of interpreting a learning event and the effect of one's action on oneself, environment, and that learning event, while reflection on action is a reflection at the time after experiencing the learning event. Reflection at this stage is a process of valuing learning experience holistically. There are three activities to do, i.e. returning to experience, attending to feelings, and re-evaluating experience by considering the implication and the result (reevaluation of experience). These two processes of reflection go on through four stages, i.e. (a) association – relating the new experience to the one that we already have, (b) integration – synthesizing varieties of information or experience one has to get the value of the experience, (c) validation – validating the truth of the synthesis and authenticity of ideas and feeling, and (d) appropriateness – making the experience part of oneself.

Based on Schon, Kolb, and Cowan theory, Bubnys [17] formulates reflective learning in three modes, i.e.

reflection on action, reflection in action, and reflection for action.

- *Reflection in action* can be related to a particular experience, which expresses reflection that reflects implicit/tacit knowledge applied in activity by transferring experience.
- *Reflection on action* is the first stage of creation of meaning after emergence of experience. In fact, one turns back to the action of previous experience, tries to analyze and to sum up the previous experience and thus to make generalizations.
- *Reflection for action* is the process where meanings of ideas, conceptions are being checked, as well as types of problems, which were hoped to have been solved more effectively than in the past, were cogitated.

V. REFLECTIVE LEARNING IN THE FRAME OF HOLISTIC LEARNING

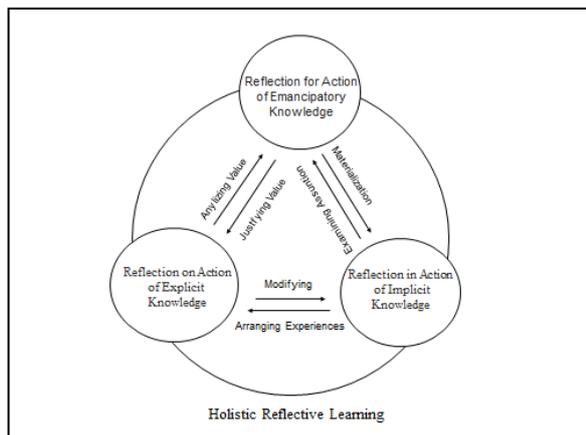


Fig. 2. Holistic Reflective Learning

Yang [9] states that learning processes are basically processes of interaction among implicit knowledge, explicit knowledge, and emancipatory knowledge. Reflection plays an important role in each of the interactions. This reflection process occurs cyclically, and not gradually. Unlike Bubnys [17] who mentions the process where the reflection process begins from reflection on action, I consider that the process can take place from whatever mode of reflection. It highly depends on the situation one faces and one's intention.

By modifying the ideas of Boud and Bubnys, I try to illustrate a reflective learning process in the context of holistic learning theory from Yang. The reflective learning process can be described as follows.

a. *Reflection in action* deals with implicit knowledge. This reflection can result in emancipatory knowledge or explicit knowledge. There are two processes that may take place: a) examining the assumptions underlying the activities, customs and knowledge,

values, beliefs in everyday lives so that the process of reflection will result in emancipatory knowledge, and we will acquire new perspectives into the reality that we face; b) doing analyses, relating experiences that we have and arrange the experience we have into the knowledge which is rational and systematic. This process results in explicit knowledge.

b. *Reflection on action*, which deals with explicit knowledge, after someone has new knowledge. This reflection includes two activities: a) analyzing and modifying knowledge to make it suitable for everyday life contexts. This reflection process results in implicit knowledge; b) analyzing values – right or wrong; good or bad; useful or useless – which underlies certain knowledge. This process will result in emancipatory knowledge.

c. *Reflection for action*, which covers two activities: a) Analyzing emancipatory knowledge to construct practical forms and ways to implement it in everyday life. This process will result in implicit knowledge. b) The process of justifying emancipatory knowledge based on concept and theory and arrange them in a paradigm which is more rational and structured. This process will result in explicit knowledge.

VI. CONCLUDING REMARKS

The society will experience continuous changes from time to time. This process will result in challenges and new problems. This requires people to develop a critical spirit and the ability to make a decision to undergo changes which are more humane. The weakness of this spirit is that an individual cannot see the signs of contradiction happening in society. Therefore, individuals are required to make the reflection of the reality they are facing, the knowledge they have, and the values which become the basis of their every pace of living sustainably.

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