Mohammad Ali

Curriculum Development for Sustainability Education

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This book is dedicated to educators and those who care about the future generation needs fulfillment and concern with cultivating competencies and awareness of every youngster on the demand for sustainability.

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Sustainability Education

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Preface

Education plays an important role in national development. It produces human resources who will later take a part in the process of national development and the quality of the human resources that can give significant effect to the development process.

National development in every UN member country should apply the concept of sustainability in an attempt to implement Global Action Program (GAP) for achieving Sustainable Development Goals (SDGs). With respect to the attempt of achieving the SDGs through education, appropriate and relevant curriculum development is highly needed for this purpose. It needs an appropriate and relevant curriculum which is developed specifically for this particular purpose. In this regard, the curriculum developers need to have a comprehensive understanding of every detail of the sustainability education and its curriculum development.

This book entitled CURRICULUM DEVELOPMENT FOR SUSTAINABILITY EDUCATION is written to facilitate its readers in obtaining an understanding of "what, why, and how" this issue must be properly addressed, particularly related to sustainability education curriculum development. It consists of eight chapters preceded by an introduction which is presenting an overview of sustainability and sustainability education and its curriculum development.

Chapter one of the book presents the demand for sustainability. The chapter explains development in the era of globalization, sustainable development, and the implementation of sustainability concept.

Chapter two deals with the discussion on sustainability education. This explains the functions of education, the role of education in sustainable development, and the implementation of sustainability education.

Chapter three explains about sustainability education curriculum. This chapter discusses various curriculum meanings and views, and the relationship between curriculum and instruction.

Chapter four explains foundations of curriculum development. It consists of discussions on the urgency of curriculum development, the the conceptual base of curriculum development, and principles of curriculum development.

Chapter five deals with an an explanation of procedures of curriculum development. This chapter covers the discussion on sustainability education curriculum framework, the design of curriculum, components of the curriculum, system approach to curriculum development, and the steps in curriculum development.

Chapter six contains an explanation of curriculum objectives. Contents of this chapter are the goals of education, multiple dimensions of intelligence development, school objectives, and curriculum objectives, and procedures for formulating curriculum objectives.

Chapter seven explains about curriculum content and organization. This chapter deals with an explanation of criteria used to choose curriculum content, topic selection process, curriculum organization, and teaching and learning processes.

The last chapter, chapter eight, deals with curriculum evaluation. This chapter contains an explanation of the principles of curriculum evaluation, models of curriculum evaluation, curriculum evaluation form, and techniques of curriculum evaluation.

It is expected that the content of this book meets what each of its readers needs in understanding the related concepts and competencies for developing relevant curriculum for sustainability education, as well as in preparing him/herself with competencies for developing relevant curriculum forsustainability education. Anyway, comments and critiques are welcome for the betterment of this book.

Teachers' Day,

November 25, 2017

Mohammad Ali

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Introduction

Sustainability education is the education aimed at cultivating awareness, and developing competencies, knowledge, skills, and attitudes towards preserving and conserving the environment in such a way that every activity in its exploitation sustains the future generation's needs fulfillment. This term indicates that the Global Action Program (GAP) which every UNESCO member country should implement in its national development. This is also well known as education for sustainable development (ESD). It is a concept in which a new education vision with an attempt of empowering people to participate in creating a sustainable future is included. Its pillars are economic growth, social and cultural development, and preservation of the natural environment.

Development in every country does not only give various positive impacts, such as economic growth and improvement of people's welfare but also gives negative ones, such as deterioration and destruction of the environment. Recent data indicates that 50% of the tropical forest which covers 6% of the earth land and consists of high biodiversity is in the risky condition. Arround 29% of the total land has become a desert, around 7.6 through 10 million hectares of the forest disappeared, and this condition is still continuing so far.

Furthermore, the use of fossil fuel energy by industries and various vehicles give a significant contribution to the accumulation

of carbon dioxide in the atmosphere which affects the global warming and climate change, and those increase sea level surface due to the pole's ice melting (Arjen, 2010).

The environment destruction has become the United Nations' (UN) concern and it leads the organization to conduct the UN Conference on Human Environment (UNCHE), held in Stockholm, Sweden in June 1972. This became the historical conference, for it was the first UN initiated conference discussing an environment which was participated by 114 countries. This also became the initial step in environment conservation. The conference concluded that there is a close connection between development, poverty, and lower education level. Poverty and lower education level are the key factors causing damage to the environment, so the forum agreed to connect national development policy, in every member country, to the policy of environment conservation.

The environmental problem needs a strategic and long-term solution. This became the collective agenda of the global community that every UN member country should implement Sustainable Development (UNESCO, 2005). World Commission on Environment and Development formulates a concept of Sustainable Development (SD), which is later also known as Sustainability. The commission defined: ". . . sustainable development is a type of development which combines the fulfillment of present needs without risking the future generations' ability to cater their own needs" (p. 43).

Based on this definition, SD is a concept of development with regards to fulfilling the present generation's needs without sacrificing needs fulfillment of the future generation. The environmental damage, actually has both the economic and social effects, such as the increase in social costs for environmental repairs. Therefore, it is basically a concept of national development combining the present and future development.

National development should apply this concept in order to fulfill the people's needs and to improve their welfare in the present time while taking into account the needs of the future generations. Very often, the efforts in fulfilling the needs and improving the people's welfare are carried out by exploring and making use of the existing natural resources. If this is done in a reckless manner, the natural resources will be depleted sooner and this, in turn, will destroy the environment if it is conducted without renewable resources for seeking of its sustainability (Ali, 2015).

Quality human resources play an important role in the implementation of SD. On their hands, development will be carried out wisely by taking many aspects into consideration, including the balance between economic benefits and environmental disadvantages. Otherwise, it will overlook many negative impacts of the development, resulting in an imbalance between the benefit of the development and the damages to the environment (Ali, 2017).

The quality of human resources can be seen from their capabilities, knowledge, skills, and behaviors. We can also identify their quality from the criteria of health and intellectual, emotional, social, and spiritual intelligence; morality which is reflected by their behavior in interacting with other human beings and with the environment; and their liability. These indicators are the products of education, particularly that of quality education. In this connection, Mochizuki and Bryan (2015), explained that:

> "According to UNESCO, there are two key dimensions of educational quality: promotion of cognitive development; and the cultivation of skills, knowledge, values, and attitude necessary for responsible, active and productive citizens. Culturally inclusive curricula and methods which include indigenous perspectives also help to create an educational experience that is more relevant to indigenous learners and to ensure that multiple and diverse intercultural perspectives are embraced in the learning environment (p. 14)."

Education, therefore, gives significant impacts on to the implementation of this concept. According to Wragg (1997): "Education is a continuous and timeless human process, stretching from the past through the present and into the future. It is the vehicle by means of which the wisdom and experiences accumulated over several millennia are transported to the next and following generation" (pp. 39-40). This means that sustainability education is education with regards to applying sustainability concept by taking into consideration its pillars, as the independent and interrelated dimensions, i.e., environment, economy, and society and culture, in an attempt to improve the quality of life.

Jenkins and Jenkins (2015) explained that the position of the three pillars in the implementation of sustainable development: ". . . ESD, which includes economics and social dimension as well as environmental ones, is viewed as being less constrained and more holistic than traditional forms of education "about" the environment (p.115). This is a dynamic concept as well as a collective attempt to look into the future when everyone will reap benefit from the opportunity to obtain an education, learn about important lifestyle, behavior, and values for the creation of a sustainable future.

In regard to implementing the concept, the 58th UN General Assembly in December 2005 agreed on its implementation and it was agreed that 2005-2014 is the Decade of Education for sustainable Development (DESD). Its basic vision is the achievement of a world where everybody has equal opportunities to obtain benefits from education for the sake of social transformation. Regarding its goals, Kahriman-Ozturk, Olgan, and Guler, (2012) explained that:

> Goals of the UN Decade of Education for Sustainable Development (2005-2014 DESD) (2005) recommended that principles, values, and practices of sustainable development should be integrated into all aspects and levels of educations and learning within three pillars. In summary, ESD aims to work with all levels

> of formal education on local and global issues and to develop appropriate ideas, attitudes, values, and behaviors with respect to sustainability in all levels of the formal curriculum starting from the early childhood. (pp. 2988-2989).

In its implementation, the government of each member country must pay attention to self-reliance in carrying out its country's development. It includes the following three aspects:

1. Community-oriented. Development is based on the needs of the local people.;
2. Community-based. Development is based on the local resources available to the local society, human resources, natural resources, economic-social-political, and institutional resources as well as the supporting values.
3. Community-managed. Development involves the local society since the planning stage up to the implementation and outcome of the activities. It will gradually shift the local people's position from the object to the subject of development.

The application of this concept involves the socio-cultural and socio-political issues, including equality of rights, poverty, democracy, and life quality. Theoretically, this can be integrated into all school subjects (Hofman, 2015). The integration is done in the form of themes, each includes various subjects, such as education for the eradication of poverty, human rights, gender equality, democracy and good governance. That way, the learning goals become so vast that it must be integrated into various school subjects, in school, and in university. Based on this, education should:

1. Provide abilities that enable the participants to have forward views anticipate and solve all life-threatening problems on this planet.
2. Understand the concepts and weigh the values as well as principles for sustainability such as:

a. Equality of tights and opportunities between generations
b. Tolerance and difference
c. Protection and restoration of the environment
d. Conservation of natural resources
e. Peaceful and just people
f. Gender equality
g. Eradication of poverty

3. Identify the complexity and inter-dependency of social, cultural, economic, and environmental dimensions in the sustainability.

Since 2015 through 2030 every UNESCO member countries are entering the global action program (GAP) for achieving sustainable development goals (SDGs).

Education from the perspective of sustainability basically teaches values as mentioned above. Through education, an individual can understand him/herself and other creatures as well as their relationship with the natural environment and wider social environment. Education teaches the value of appreciating other creatures, the value of understanding diversity and difference as well as justice, responsibility and tries to bring out dialogues on the subjects. That is why education is an important means to promote the values in order to achieve sustainability.

Since this constitutes a global awareness, the message is directed to all developed and developing countries. In its implementation, every country must define their own priorities, goals, and action programs which must be adjusted to the local environmental and socio-economic conditions. In this regard, reviewing the objectives, contents and teaching method of the existing curriculum is required in order to develop a trans-disciplinary understanding in viewing social, economic and environmental issues. Thus, it needs to evelop the related-curriculum and effective teaching-learning strategy as well as its evaluation (Pruneau, Lang, Kerry, Fortin, Langis, and Liboiron, 2014). For this regard, a comprehensive understanding of curriculum development for sustainability education is demanded.

Chapter 1

Demand for Sustainability

The development carried out by various countries around the world has encouraged the dynamics of similar development in every aspect of life. When it is carried out wholeheartedly on the right track, it may lead a nation to a higher standard of prosperity. However, development always comes with two different opposing consequences. On one side, the development results in the advancement and increase of national living standards, while on the other side, it may create unwanted negative side-effects, such as the widening of disparity in prosperity and ecological destruction (natural environment).

Many countries of the world have tried to make advancements in science, technology, economy, and industrialization as means for rapid development in the future. Various countries try to develop their own excellence, using sophisticated resources, science and technology-based industries, investment, and innovation. The strength of human resources to master science and technology has made the world even more developed and luminous. At the same time, the successful development has resulted in an even wider disparity between developed countries, developing countries, and underdeveloped countries.

Development in the Globalization Era

The development strategy adopted in any country today must take the globalization effect into account. Globalization is simply defined as a condition where countries of the world barely have boundaries except for administrative territorial frontiers. Various aspects of life no longer reflect the uniqueness of a nation or country. A major event such as economic crisis occurring in one country will also affect other countries. The globalization phenomenon can be easily seen to have a tremendous effect on the information sector. Erikson (2007) describes: "Globalization is not a unidirectional process. It has no end and no intrinsic purpose, and it is neither uncontested, unambiguous nor ubiquitous" (p.7).

In the globalization era, an event that has occurred anywhere can be readily accessed by those who live in another part of the world at the same time. However, it can be seen as a process of unifying all countries and nations on earth as well as creating a new order of life. Globalization has also redefined various concepts of the relationship between different societies of the world. In this context, the concept of development is not only affected by basic assets and potentials, or comparative excellence of a country but is also closely associated to the global context (information exchange, economic interaction, transfer of science and technology which create challenges and opportunities as analyzed below.

Challenges and Opportunities of Globalization

The acceleration of the globalization process is mainly supported by rapid developments in the field of Information and Communication Technology (ICT). Friedman (2000) explained that the rapid development of information and communication technology is the main characteristic of the third-wave of globalization.

With the advanced ICT, the interaction between societies, including cultural and economic transactions, for example, does not only occur in a real life or face-to-face, such as in the case of tourism, but also in the cyberspace. At the moment we can access new ideas and experiences cross-culturally, such as fashion, literature, and cuisine. In terms of economic activities, the market and production activities in various countries will give rise to interdependency as a result of the international growth of commerce, the investment made through Foreign Direct Investment (FDI), the increase of multinational companies' influence, and the domination of international organizations, such as World Trade Organization (WTO).

Globalization has given way to common problems, such as environmental crisis, multinational crisis, regional inflation, etc. Major crisis and economic recession occurring in the States and in Europe, for example, will directly affect the economic stability in other regions, such as Asian countries. Therefore, the development and its effects must be accompanied by collective awareness. This is the reason for which a number of world agreements such as Millennium Development Goals (MDG's) were reached and the Summit Meetings on Climate Change are successively being held.

In the Globalization era, education sector should be empowered at all times and remain continuous and systematic. Education should be able to produce generations with high competitiveness, creativity, and innovativeness which is also based on morality and identity in order to transform any country into a dignified nation among the global community. In order to produce competitive output, innovations must be made in the attempt of developing the education sector. Without significant innovations, our education system will only create graduates who are dependent on routine or others' inventions.

Good quality education with problem-solving approach can actually give rise to a generation of human resources who are creative

and innovative as well as who has a comprehensive understanding of national affairs. They should have high integrity, credibility, and adaptability, and moderate. In addition, they care about the competitive development of the nation. Generally, this creative and innovative generation should possess the following competencies and abilities of:

1. Competing, staying strong with integrity and discipline.
2. Creating a solution, even at cost of certain risk.
3. Leading, setting an example and also being a good follower.
4. Working in a team or individually.
5. Understanding the diversity of national and global culture, and capability to adapt.
6. Mastering knowledge of the national as well as international importance.

The ability to manage opportunities of the globalization era will eventually be advantageous to a country in formulating its national development plan. Within this context, national development must be able to outline the optimization of potentials and basic assets available which are in line with the opportunities, challenges and global standards.

Globalization will affect the level of competitiveness. In a competition, there are always certain parties who will reap the most benefits. The key to reaping the benefits, in term of winning the entire competition, is to strive towards excellence more than other participants. In the context of international competition, those who are best at mastery of science and technology will be the winners of the competition (Eriksen, 2007). In this era, the world is no longer mapped according to political power, such as West vis-à-vis East or Capitalist-Liberalist vs. Socialist-Communist. The mapping of the globalization era will instead be based on the power of science and technology, much more than any other factor.

Jeffery Sachs (2005), a world-renowned economist in his book A New Map of the World, divides the world according to each nation's control power over science and technology.

First, around 15% of world citizens are technology innovators, and in this group are the United States, Britain, Japan, Taiwan and South Korea. China and India are predicted to enter this category soon. China is "a sleeping giant, which is being awakened and stood (which is later equal to) other countries in this category. With such power over science and technology, these countries may be the indicator of the 'new world order', or in Friedman's (2000) words: the shapers.

Second, around 50% of the other world citizens are technology adopters. In this category includes developing countries, such as Indonesia. In the 'new world order', this group studies and adjusts technology to their needs (adopt) in line with the policies of innovator countries.

Third, around 30% of world citizens are technologically excluded or are unable to acquire technology. In this category are poor and underdeveloped countries which are lack of advanced science and technology. Most of these countries will base their economy on natural resources exploration, many of them are unable to adopt advanced technology, and drown themselves in national debts that they won't be able to repay.

The differences in the mastery of science and technology will widen the disparity between developed and under developed countries. Each country responds at a varied pace to be more advanced than they are, while the globalization will sweep like a great flood. Therefore, it is inevitable that we must face it whether we like it or not. However, we know that the main key to managing the globalization competition is the development of human resources.

In reference to this, it is reasonable to say that the paradigm of development cannot only depend on the economic and physical

aspects, but also on the development of skilled and qualified human resources to overcome the challenges of science and technology. They should possess good moral and humanity as well. The implementation of the development will also require the application of sustainable development principles.

The development process requires the participation of all elements of society as the main human resources supplier. Therefore, the entire society should be able to reap benefits from every activity which is carried out during the process. Without their active participation, the development will not yield maximum results and the society will not be able to reap benefits from it. This is why, to a certain extent, the development process is considered as a social process of making the human resources more competent to survive in the ever-changing world (Ali, 2015).

In order to make human resources more competent, a human resources development program needs to be carried out on a continuous basis. This program should be closely related to education, and therefore, education becomes an attempt of social engineering to give the society the ability to shape a certain pattern of behavior in order to improve the people's living quality. The human resources development program is not only the responsibility of the government but also of every person who truly cares about the development and improvement of living standards, welfare, and human resources quality.

National Development Paradigms

Development is a planned attempt at making changes with the main purpose of improving the people's living quality, welfare, and human resources quality. The improvement of living quality requires certain infrastructure, facilities and basic facilities which may affect the improvement of national dignity and pride. The national dignity and pride are based on various factors, such as skills in

various fields, competence, and positive behavior in interacting with surroundings. The national development should be directed towards such achievements: the improvement of national dignity and pride.

The attempted changes of development do not only include material aspects, but also mental and spiritual ones and skills in various fields. For such purposes, the society needs to be encouraged and facilitated in order to participate in the development, because the main benefactors are the people themselves. This means that each member of the society should be aware of and have a sense of belonging towards the achieved development instead of merely enjoying it.

The national development of a country may adopt either a materialistic or a human-needs fulfillment paradigm. The first paradigm focuses on the material and physical dimensions, whereas the latter focuses on the human dimensions. Generally, developing countries adopt the first paradigm, which is initially introduced and used in western countries. The materialistic western development paradigm is indicated by physical and economic achievements, quantified in the form of mathematical equations and statistical numbers. The results of development are presented in rows of numbers in tables and charts, which symbolize the physical and material success of a given country. Such development ignores the human aspect as the main subject of the development and negates the most basic human pride and dignity.

The second development paradigm was proposed by Haq (1999) in his famous book titled: Reflections on Human Development, which also marked the shifting of development paradigm from "national income accounting" to "people-centered policy". The human development paradigm is concerned with both building up human capabilities through investment in people and using those human capabilities fully through an enabling framework for growth and employment. This paradigm consists of four essential components:

First, the equality. This refers to the equitable access to political and economic resources which is the basic rights of every citizen: This reflects a number of measures such as 1) fair distribution of productive economic assets; 2) distribution of income through the improvement of fiscal policies; 3) organizing banking credit system to give opportunities to small and medium enterprises; 4) organizing a democratic political system to ensure political rights and freedom; 5) organizing a legal system to enforce justice.

Second, the productivity, which refers to systematical attempts which are meant to improve economic activities. These attempts require an investment of human resources development, infrastructure, and finance in order to support the economic growth, which in turn will improve the welfare of the people. In order for the production capacity to be at its maximum, investment must be focused on the attempt of improving human resources quality, marked by the development of knowledge and skills as well as the mastery of technology. The high quality of human resources plays a central role in the development of a nation.

Third, the empowerment, which refers to the attempts of developing a society's capacity by transforming the peoples' potentials and skills, such that they will be self-reliant, autonomous and authoritative in executing their duties and solving social problems. Within this context, the development places human as the center of attention with the purpose of not only improving their growth and income but also expanding public choices so that all society members will have the opportunity to develop their potentials.

Fourth, sustainability, which refers to the strategy in managing and maintaining development assets, such as materials, human resources, finances and the environment in order to achieve the main aim of the development, that is the people's welfare. It implies that improvement, renewal, and the conservation of development assets are highly essential to maintain the sustainability of the future development process.

The human development paradigm has now become the central theme in discussions on development issues. The development orientation has shifted from merely achieving the macroeconomic indicators, such as improving the national income and fiscal stability to that of reinforcing societal development.

In relation to this, there are at least six reasons for which the human development paradigm is considered essential: 1) the development's final purpose is to i mprove the human pride, dignity, and quality of life; 2) it carries a mission of eradicating poverty; 3) it encourages maximum productivity and increased control over goods and services; 4) it conserves the natural environment and keeps the balance of the ecosystem; 5) it strengthens the foundations of society or civil society and the political institutions to develop democracy, and 6) it maintains socio-political stability suitable to the implementation of development activities.

This paradigm places humans as the vehicles as well as subjects of development. In the development process, human or society does not only act as the tools of development but also as its subject. It means that the development process must involve active participation by the people. With such perspective, the development must be directed to empower the people to participate in the development process. Placing human as the subject of development means directing the development towards its most essential purpose: peoples' empowerment, and meeting basic human needs.

The development model for empowerment has the implications for the creation of impartial welfare programs. The program places humans as the motor of change and advancement in a planned, systematic and comprehensive manner. The people contribute aggregatively to the development so that the development becomes a collective work, whose advantages can be enjoyed equitably and justly by everyone.

Responding Globalization Challenges

The development can be seen as a planned process of social changes. Development has become the "ideology" of a country in pursuit of advancement. Development is a planned process to make changes which will eventually improve the people's living standards (welfare). However, there will always be a negative excess from the development process, as explained above (Ali, 2015).

There is no single development concept that stands as a whole, which can handle all types of problems without negative consequences. Therefore, a development should at least have a measurable parameter. The success of a development is reflected through five elements that can be seen objectively. The five elements are:

First, development is initially seen in the framework of socio-economic growth. The development will be successful if economic growth of the society is quite high, measured by the country and its people's productivity annually through its Gross National Product (GNP) and Gross Domestic Product (GDP).

Second, inequality in income distribution which is generally measured through the use of Gini coefficient. The coefficient is calculated by comparing the Lorenz curve of a ranked empirical distribution with the line of perfect equality ranges between 0, where there is no income concentration (perfect equality), and 1 where there is total income concentration (perfect inequality).

The coefficient is calculated from the ratio between ideal income distribution (A) with the ideal and real amount of income (A+B), which is derived from the Lorenz curve dividing income into three groups: high income group (20% citizens) receiving 60% of the national income, middle income group (40% citizens) receiving 32% of national income, and lowest income group (40% citizens) receiving 8% of the national income. The resulted coefficient ranges between 0 and 1. The more it is closer to 0, the more ideal is the income distribution.

Third, life quality of a country can be measured by the citizens' welfare rate using the Physical Quality of Life Index (PQLI), the value of which is the average of three statistics: basic literacy rate, infant mortality, and life expectancy at age one, all equally weighted on a 0 to 100 scale.

Fourth, the impact of development on the natural environment must also be considered. The development must take into account the conservation of the natural environment so that it can be sustainable.

Fifth, development must be able to create social justice and sustainability. The ongoing development often results in a wide disparity among the people. A nation's development often enriches the already rich people and makes the poor people suffer even more.

The national development should focus on the fulfillment of ten basic rights through the development of human resources instead of merely physical and economic achievements. Physical development can be seen and experienced through the establishment of facilities that the society needs. Economic development is also marked by the growth of various small, medium and large businesses and industries. The whole development of human resources is an effort to improve humans in every possible aspect, not only in physical and economic aspects but also in the ability to fulfill their basic needs.

Development should focus on the development of human resources capacity and quality., This is the most valuable asset of a country in facing the challenges of globalization. The orientation reinforces the concept of development from the perspective of human development as well as the human resources' central role as the subject of the development instead of merely as the development object. Countries which are focusing their development in the efforts of human development have realized that preparing quality human resources is a conditio sine qua non for the national development to be able to thrive amongst the international competition (Ali, 2015).

Sustainable Development or Sustainability

Development which focuses on human development approach should stand on four pillars, namely I) empowerment; 2) equality; 3) productivity; and 4) sustainability. The empowerment is an attempt to support a group of societies which have the productive capacity but lacks the opportunities of access to the natural environment and modern entrepreneurship, without having to become a victim of foreign values and institutionalism. The equality includes the equitability, balanced and just availability of opportunities in making use of the resources for the improvement of the people's living quality.

The productivity means as an attempt of improving employment-friendly economic growth and output through the use of competitive technology. The sustainability relates to the natural resources continuity and their conservation so that the future generation is capable of taking advantage of their existence. The sustainability aspect contains the essence of development activities directed towards the creation of developed conditions which are sustainable economically without depleting natural resources and jeopardizing local values, sources of livelihood and other resources for sustainable economic growth and welfare of the future generation.

This is the concept of national development of a given country in fulfilling the needs and improving the welfare of its people in present time while taking into account the needs of future generations. The state's efforts in fulfilling the needs and improving the people's welfare are often carried out by exploring and making use of the existing natural resources.

When this is done in a reckless manner with no regard for the environment, the natural resources will be depleted sooner. This, in turn, will destroy the environment due to rapid exploitation, if it is done without exploration or generation of renewable resources for sustainability. The outcome of development will only be enjoyed by the current generation who exploit and consume the natural

resources for short term only, whereas the future generations, who are in reality entitled to all the existing natural resources, will not be able to enjoy them.

As the organization under UN which is responsible for promoting education, UNESCO adopts the concept and infuse SD in the education sector. Concerning its implementation goals, this organization proclaimed 2004-2014 as Decade of Education for Sustainable Development or DESD (UNESCO, 2005). This can be viewed from three perspectives, namely socio-cultural, environmental, and economic standpoints (Ali, 215; Summers, 2013; Pradham and Mariam, 2014):

- From the socio-cultural perspective, DESD is seen as the attempts to fulfill human rights and achieve national defense, world peace, national life survival, gender equality, cultural diversity, intercultural understanding, healthcare, and prevention and management of harmful diseases SD goals, such as HIV/AIDS.
- From the environmental perspective, it becomes the attempts to utilize the natural resources equally with regard to the future generations' needs, climate change anticipation, changes in the natural environment in both urban and rural areas due to urbanization, and prevention of the disasters which is triggered by human activities such as forest exploitation causing floods and droughts.
- from the economic perspective, it is seen as the efforts to reduce poverty, to improve welfare, to achieve sustained economic growth, and to establish economic independence and national competitiveness.

The current threats to the environment are related to uncontrolled population growth, urbanization, development of infrastructures triggered by the expansion of development in urban and industrial areas. This has resulted in the increase of land and air pollution and

problems related to the increasing volumes of garbage or industrial waste and household trash, which can be hazardous to our health. It has also increased the society's consumption on a global scale, causing the rise of demands on raw materials, energy, and water. It gives some implications for degradation of humanity, cultural and spiritual values.

The global community has realized that environmental issues are closely related to the economic and social conditions. This justifies that the social, environmental and economic needs must be fulfilled equally so that the development results can be enjoyed by future generations as well. However, one of the most crucial issues is to find the ways to improve social welfare by using natural resources wisely, so that the renewable natural resources can be conserved and non-renewable resources are utilized wisely and efficiently, and the needs of future generations will still be fulfilled.

By applying the concept, the existing natural resources can be used wisely, which is due to the preservation of the environment, as it is indicated in its meaning, as follows:

> Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within two key concepts (1) the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given, and (2) the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs" (http://www.iisd.org/sd/).

Therefore, SD is basically a concept of national development combining the present and future development. This concept is applied to several countries in the world, including developing countries. Even though the concept is just related to ecological problems at the beginning, it has now included various other fields such as the economy and social balance.

National development is usually related to the efforts of achieving the aim of improving the people's welfare. In relation to the economy, development is designed for economic growth as measured by certain indicators, such as the improvement of gross domestic product (GDP), gross national product (GNP) and income per capita which often include output from exploiting the natural resources at the cost of environment. The implementation of sustainable national development program should take the exploitation effects into account to prevent environmental damage as best as it can. To achieve this, we need development agents who have not only a certain level of competence and professionalism but also have wisdom and virtue, based on the awareness of the importance of preserving the natural environment in a wider context.

Human resources as agents of sustainable development are those who have such characteristics and have participated in the relevant education of high quality. Therefore, education plays an important role not only in the attempt of shaping the skills, knowledge, understanding, and awareness of sustainable development but also in the attempt of innovating technology which may produce eco-friendly products. This can be the basis for improving the quality and output of national education system for global competitiveness arena as well as supporting the concept of sustainable development.

Evolution of The Concept

The concept of sustainable development or sustainability was initially developed for forestry, especially in the efforts of conserving the rainforests without hindering their usage but sustaining them through re-plantation. According to this concept, logging is carried out in a wise manner by selecting trees that fulfill the criteria for logging and replanting the logged trees to prevent environmental damage on the forest and to avoid future catastrophes such as flood and erosion on critical lands.

This was initially used in the context of natural protection and the world biosphere in the 1980s, just like how it was stated in the 'World Nature Protection for Conservation of Nature' and 'World Wide Fund for Nature'. The purpose of this conservation is to use the existing biological system that does not change its essential characteristics. The application of this concept was further extended to the concept of sustainable development which included economic, ecological, and social aspects as stated in The Brundtland Report in 1987 (Ali, 2017).

In order to intensify the application of this concept, the United Nations (UN) organized a UN Conference on Environment and Development (UNCED) in 1992 in Rio de Janeiro. At the end of this conference, around 170 countries signed the Agenda 21 with the sustainable development as a global objective, which is basically emphasized the importance of global cooperation and partnership to deal with world's ecological and social problems.

The conference' s report also formulated the concept of Sustainability, from theory to application which is emphasized on the conservation and improvement of social, ecological and economic needs are the main aims of sustainable development. It refers to the three pillars of sustainability: ecology, economy, and society. The report also describes practical steps and means of achieving the sustainability goals.

The sustainability concept was made in a reference to the development program of World Commission on Environment and Development. The definition states that: " ... a sustainable development is a type of development which combines the fulfillment of present needs without risking the future generations' ability to cater their own needs (page 43)".

In July 2001, European Union member countries held a conference in Gothenburg, Sweden, to discuss the future of Europe and take into account the general guidelines of related policy. The

recommendations of the conference stated that development should be carried out by taking into account the principles of sustainability to fulfill the present generation's needs without risking the fulfillment of the future generation's needs. Therefore, all forms of economic, ecological and social policies must be made synergic so that they can reinforce each other. If the development is unable to stop the tendencies which risk the future living quality, then the society's costs will increase dramatically and the negative tendencies will reach points of no return.

This concept was further adopted by UNESCO to be applicable to education. In UNESCO's proclamation concerning international implementation strategy for the Decade of Education for Sustainable Development, the focus was on achieving sustainable development (UNESCO, 2005). In this connection, UNESCO described in detail the characteristics of unsustainable development. The following characteristics were identified which symbolize unsustainable development:

First, unsustainable development may witness a rapid, even high economic growth. However, the leap in economic growth might have been carried out by exploiting the environment in an unwise or excessive manner, putting the sustainability of the environment at risk.

Second, the economic growth of the country may have been among the fastest in the world, but the distribution of welfare is somewhat unequal and consequently, there is still a large percentage of citizens living in poor conditions.

Third, the infrastructures of countries implementing less sustainable development are in poor conditions and are vulnerable to economic and social dynamics and mobility.

Fourth, the high level of poverty is due to the imbalanced distribution of development or the less significant level of economic growth.

Fifth, healthcare services are still insufficient, resulting in low healthcare rate coverage and high mortality rate.

Sixth, natural disasters are not well managed and there's a lack of early warning, resulting in catastrophe.

Seventh, indecent housing conditions accompanied with the lack of energy and clean water as well as sanitation.

Eighth, the people's ability is still not used optimally.

Dimensions of Sustainability

The concept can be viewed from the three perspectives of socio-cultural, environmental, and economic:

- *Socio-cultural perspective*. In this perspective. the sustainable development is seen as the attempts to fulfill human rights, and achieve national defense, world peace, national life survival, gender equality, cultural diversity, intercultural understanding, healthcare, and prevention and management of harmful diseases such as HIV/AIDS.
- *Environmental perspective*. This perspective conceives the sustainable development as the attempts to utilize the natural resources in a balanced manner with regard to the future generations' needs, anticipated climate change, and changes in the natural environment in both urban and rural areas due to urbanization, and prevention of the disasters which is triggered by human activities, such as forest exploitation causing floods and droughts.
- *Economic perspective*, in which the sustainable development is seen as the efforts to reduce poverty, improve welfare, achieve sustained economic growth, and establish economic independence and national competitiveness.

This concept of SD has developed as a consequence or part of the industrialization process, both in the developed and developing

countries. Its birth was triggered by environmental damages. The damages are the collateral effect of industrialization in European countries and the development process in third world countries. The industrialization and development processes are carried out as an elaboration of modernization theory which is naturally established within the framework of capitalist interests.

The theory of modernization emphasizes the importance of economic growth. The application of this theory gives way to the attempt of rapidly developing the economy of third world countries through the means of unsupervised exploitation of the natural resources. When reaching certain limits, the exploitation may degrade the environment and threaten the natural life and inheritance of the future generation. The awareness of impacts on the environment of these industrial and development processes also give e rise to the concept of sustainable development.

The development paradigm which is based on the theory of modernization is largely criticized. The sharp ones are given concerning with the exploitative capitalist development model designed by the western countries for the third world countries in order to cultivate the capitalist economy system. In western countries' perspectives, the countries are regarded as still undergoing the modernization process, especially economic growth. The economic growth is expected to run according to certain processes or stages experienced by capitalist countries in their development stages in the 19th century.

Within the modernization context, the western ways or the import of materials from western countries is part of the modernization itself. Therefore, modernization process is often called as westernization, which includes industrialization, democracy, and market economy. The effect of exploitative industrialization on the natural resources and environment gave birth to the concept of sustainable development, an economic development concept which gives priority to the environmental aspects.

UN Perspective on Environment and Sustainability

The environmental dimension in the concept of development used by UN appeared when the evaluation of the first stage of world development concept (1960-1970) was reviewed to plan for the second stage of the development in the UN Conference on Natural Environment in Stockholm 1972. In the conference, the environment was first introduced as part of the development concept.

During the UN Conference on Environment and Development held in Rio de Janeiro in 1992, various criticisms were raised against the concept of environmentally-based development (eco-development) which was considered a failure since it did not bring any significant changes. The development of new science and technology, for example, was considered disadvantageous to developing countries, since around 70% of world citizens living in developing countries only receive 30% of world income, resulting in continuous inequality.

The concept of sustainable development was further developed by the World Commission on Environment and Development, which is also known as The Brundtland Commission, in the report on 'Our Common Future'. This also emphasized by the result of the Rio de Janeiro conference which is reflected in the Convention of Biodiversity, Convention of Climate Change, and the Declaration of Sustainable Development of Forest Management, as well as in Agenda 21.

Actually, the concept denotes to a development process (land, city, business, society, etc.) based on the principles of fulfilling the present needs without risking the attempts of fulfilling future generations' needs. One of the issues of achieving sustainable development is how to repair the environmental damages without sacrificing the economic development and social justice. This has affected the policies and laws of the environment in various countries.

In 2002, UN held the World Summit on Sustainable Development (WSSD) in Johannesburg. This was attended by the world leaders,

relevant community groups, organizations funded by the UN, international financial bodies, and other important actors to assess changes occurring all over the world after the Earth Summit or the first UNCED in 1992 in Rio de Janeiro, Brazil. In the WSSD, the results of the summit are principles of sustainable development as a new approach based on the considerations of association and dependency of three aspects: (1) economic development, (2) social development (3) environmental development. These become the pillars of sustainable development. Thus, the development scheme can be found at the meeting point of the three pillars.

Universal Declaration of Cultural Diversity, in 2001 further explores the concept of sustainable development by stating that cultural diversity is as important to humans just as biodiversity is essential to nature. Therefore, 'development is not only regarded as economic growth, but also the means to achieve intellectual, emotional, moral and spiritual satisfaction'. In this perspective, cultural diversity is the fourth policy pillar of the sustainable development policy sphere.

Implementation of The Sustainability Concept

The sustainability concept actually includes a very vast scope and it is often considered ambiguous, while the parameters and indicators of sustainable development continue to grow according to the understanding of each organization involved. However, in context of the above backgrounds and conception developed by the UN, we have to be aware of the importance of sustainable development since the damage inflicted on the environments as a result of economic development is already at an alarming level. This can be observed by the phenomena of climate change, global warming, drought, natural disasters, etc. This paradigm is supposed to be a collective awareness of all nations of the world in implementing their development programs.

Even though the implementation of sustainability concept includes various aspects, it is closely related to the economic growth. The attempt of accelerating economic growth in regard to the environmental sustainability should possess the following characteristics:

1. Promoting a more efficient pattern of economic growth.
2. Producing efficient production system, minimizing environmental damage.
3. Using a more eco-friendly technology
4. Consuming a more efficient consumption pattern (although this is hard to achieve)
5. Promoting new policies in order to institutionalize economic growth which focuses more on the conserving the sustainability of the environment, both in the context of social and cultural reality.
6. Applying the laws on the protection of the environment
7. Implementing the concepts of sustainable development through education curricula, advocacy, awareness campaign or action, etc.

In order to implement environment protection and sustainable development programs, effective regulations are required to act as references and tools for the implementation of sustainable development programs, especially those related to:

1. Economic Aspects Regulations. For example, the economic regulations made by Enquete Commission of German Parliament, which suggested the following economic regulations within the context of sustainable development:
    a. The economic system must efficiently fulfill the needs of community and individuals. For that purpose, economic regulations must be shaped in such a way as to improve personal initiatives (personal liability) and the desire of

individuals to serve common needs (public liability) for the good of the present and future generations. This must be organized in such a manner that individual and public interests can be aligned.

b. Prices must function as a market guide and must reflect the availability and costs of resources and production of goods and services.
c. The conditions of the surrounding environment for competitive purposes must enable the market to function well, and there must be innovations and long-term decisions that are directed to future needs.
d. Efficiency of the economy of the people and the production basis, as well as social and human relationship must continue for eternity. This has to improve both in terms of its quality and quantity.

2. Ecological Regulations. Fort example, German Enquette Commission proposed the following ecological regulations:

a. The usage of renewable resources must not exceed the regeneration ability of the resources.
b. Emission must not exceed the capacity of the individual ecosystem.
c. The anthropogenic effect period on the environment must be balanced with the process and period of natural ability to react in the related environment.
d. Risks and dangers to human health caused by anthropogenic activities must be minimized.

5. Social Regulations. For example, the social regulations made by Enquette Commission are as follows:

a. State as the constitutional social organization must apply and uphold human dignity and free development of human characters in the present and future time in order to preserve social peace.

b. Every member of the society obtains benefits from the society according to his/her contribution to the social guarantee system and of poverty.
c. Every member of the society must be able to give solidarity contribution to their society according to their level of capability.
d. The social security system can only grow by relying on the existing economic standards.
e. The productivity potentials of the entire society must be enhanced for the benefit of the future generation.

The implementation of sustainability concept is very important for the national development, considering that today we are in the following era:

1. Rapid changes and contradictions of various aspects of life as well as challenges.
2. Innovations achieved by mankind in the following fields:
   a. Science and technology
   b. Business
   c. Revolutions in information and communication technology
   d. Democratization
   e. Globalization
6. Deterioration marked by the widening disparity between:
   a. The powerful and the powerless segments of the society
   b. The rich and the poor segments of the society
3. The increasing danger to Earth, marked by the global warming, climate change, poverty, pollution, violence, and terrorism.
4. Increasing crime, greed, corruption, and degradation of humanity, culture and spiritual values.

The current threats to the environment are directly or indirectly related to the factors noted above. The environmental deterioration is being caused by high or uncontrolled population growth, urbanization, development of infrastructures triggered by the expansion of development in urban and industrial areas. This has resulted in the increase of land and air pollution and problems related to volumes of garbage or industrial waste and household trash, which can be hazardous to our health. There has also been an increase in the society's consumption on a global scale, causing the rise of demands on raw materials, energy, and water. It has also implications for the degradation of humanity, cultural and spiritual values. All of these call for the judicious implementation of development programs.

Development in various countries in the world has been carried out in a rapid and progressive manner. The world population has increased drastically from 1 billion people in 1806 to more than 6 billions in 2006. The increase is not limited to the quantity, but also the lifestyle and living standards encouraged by various innovations of technology, changes of institutions, increasing amount of investment and the globalization of information network. These developments have made a tremendous impact on threats to environmental sustainability.

There are several crucial points that relate to the rapid changes in global civilization which affected the world's development, as described below:

First, it began with the Renaissance era in the beginning of the fourteenth century until the seventeenth century. It started with the cultural movement in arts, but ultimately acting as the dynamic motor of the development. Some fresh ideas and innovations in the world of science altered the long reign of tradition.

Second, the Renaissance was followed by the Enlightenment age which began in the early eighteenth century.

Third, the industrial revolution began in the mid eighteenth century to the mid nineteenth century. Society became more motivated to develop ideas and test new inventions. In 1769, James Watt was known in history as the maker of the steam machine, by modifying a previous invention, which triggered the industrial revolution. Various machines were developed to power boats, trains, and cars. Industrial machines were also invented to process raw materials into ready-to-use mass products. Along with the invention of machines, experts began to develop the usage of energy sources, such as coal and raw oil, taken from the bowels of the earth.

The fossil energy, processed in millions of years, was depended upon to power modern human lifestyle. The inventions and engineering of technological innovations were marked by the development of modern machines and large-scale industries, and they brought with them the socioeconomic changes. In 1776, Adam Smith stated his concepts on the free market economy, marking the birth of economics as a science.

Fourth, the world conquest by humans and colonialism occurred from the sixteenth century to the mid twentieth century. At the time human exploitations were practiced in the form of slavery. Black people from Africa were brought as labors to America to do the works of opening new farms, ranches, and mines. Meanwhile, Asian and Southern American natural resources were mercilessly exploited and brought to European countries, hence making them the advanced and prosperous countries we know today. Europeans also conquered Australia, making it a crown of territorial expansion and source of influence in the Eastern World. Human colonialism and natural resources raid carried out by European nations on other world nations, especially Asia and Africa, contributed to many conflicts and problems. Surpluses produced through agricultural activities in the form of food crops and mining activities in the form of industrial raw materials were used to develop industries in advanced countries.

Fifth, the Second World War ended the colonialism era, followed by the rise of ex-colonized nations which declared their independence one after another. Strong and advanced countries who won the war, as well as those who lost the war, developed themselves in technological, industrial and commercial sectors in highly competitive conditions. Newly independent countries went through the rapid growth of their population. Currently, most countries of the world are trying to boost their economic growth, technological development, and prosperity in the environment of global competition.

The development of science and technology has enabled mankind to control uncertainty and manage changes in order to achieve their goals. Therefore, the population continued to grow along with the improvement of healthcare and living quality as well as the surrounding environment. These changes became the basis of a population boom. World population which had been below half a billion people for centuries increased drastically since the onset of the industrial revolution.

In 1806, the world population reached 1 billion. Since then, it has been increasing gradually to two billion in 1927 and three billions in the 1960s. In less than half a century, between 1960 and 2000, the population multiplied to six billions people. The tendency will still continue, as it is shown by the curve imitating the character 'J', and the world population is predicted to reach 9.7 billions in 2050.

The world change has certainly brought impacts on the environment, which must be anticipated well. The rise of the world population, which is described above, triggered an escalating increase in the need for food, clothes, housing, and energy. Countries are competing with each other to carry out development for fulfillment the increasing needs.

However, many of them still base their standards on conventional development model, focusing only on economic growth. In the conventional development model, the achievements in form of

increased production of goods and services, which are the elements of Gross Domestic Product (GDP) and Gross Regional Domestic Product (GRDP), do not accommodate the environmental aspect. Social development is also overlooked so that in many aspects poor people are marginalized during the development.

The conventional model of development gives birth to virtual economy growth or pseudo growth. Under this model, the success of development which is generally measured through GDP and GRDP, the economic growth in developing countries is usually is achieved through exploiting natural resources in an exploitative, aggressive and expansive manner. As a result, degradation and damages to the natural resources occur. The implication of such activities may damage the economic growth's performance (self-destructive) in the long run. This happens when the development is carried out only to fulfill short-term needs and interests, with no regards to the sustainability for the future generations.

On the other side, industrialization development process does not offen pay serious attention to the environmental effects, causing pollution and contamination. High energy consumption also affects the quality of the natural environment. For example, forest logging is being carried out without replanting. Forests are exploited without regard to their function as ecological support for the surrounding areas.

Businessmen who are exploiting environment do not attempt any research or solution to the management of former mine shafts, which will be submerged in the future. For example, due to the relentless exploitation and exploration of Mount Grasberg in West Papua by Freeport Indonesia Company, the mineral resources are now exhausted. There are many other ways to which the deterioration of natural environment occurs, besides extraction of natural resources.

The use of fossil fuel (oil, gas, and coal) increased tremendously with the modernization of the life style around the world. This has

resulted in an increase in carbon dioxide and sulfur oxide gas content in the atmosphere, raising Earth temperature and melting ice in the poles. Its long-term effect may come in the form of submersion of many seaside cities in the whole world. It is necessary to know that the use of fossil fuel may diminish the ozone layer, or even create a hole on it, rendering life forms on Earth vulnerable to ultraviolet radiations from the sun. Its collective effect may threaten the very existence of life on Earth.

Another issue that we need to be aware of is the contamination of nature by waste products. Many irresponsible businessmen dispose of their toxic industrial waste to improper places for their private cost-saving reasons. In addition, thick smoke coming out of factory chimneys or turbid solution containing awful stench is disposed of a running river.

These are examples of environmental damages caused by irresponsible behaviors in the development of economy with no regard to the sustainability of development or environment. Even the existence of some of the industries is a potential threat to the safety and life of all living creatures on Earth. The Bhopal tragedy in India in 1984 was an example of how bad an industry can jeopardize human safety. The tragedy happened when a chemical substance container leaked and killed hundreds of people in the area.

The types of industries prone to causing damages to aquatic environment include vegetable oil factories, chemical industry, textile industry, bottled drinks industry, canned meat industry, pulp and rayon industry, soybean sauce industry, canned fruits industry, and wood industry. Industries that often cause noises are metallurgy industry, zinc industry, iron industry, etc. Dust and ashes circulated around the factory area, like dust from cement industry, chalk industry and toxic gas from the aluminum processing factory can cause air pollution. The toxic gas waste is absorbed by local plants that are consumed by a human.

The threat to the environment does not only come from manufacturing industries as mentioned in the examples above but also from the exploration of natural resources. A lot of natural resources are exploited in such a way that they are almost exhausted. Crude oil supply is reducing by the lot, and at the same time, alternative fuel has not yet been developed. The same goes for other types of mining, such as coal and gold, of which the exploration usually causes damages to the environment.

If the exploration of the natural resources done unwisely even for the purpose of economic growth, then it will have negative effects on the quality of living, which can eventually cause the economy to collapse. For example, environmental degradation even around the company area will create a high social cost to the economy. The company must allocate extra cost to clean contaminated water and air.

The conventional development model, which focuses on the economic growth with no regard to the preservation of the environment, must be discarded. This is due to the real impacts on the environment and the future generation. The awareness of the negative consequences of the conventional development model has existed since the birth of sustainable development concept. Since then, the world realized that the management of natural resources and the preservation of the environment must be integrated with social issues such as poverty. This was discussed in the 1972 UNCED conference, in which it was agreed that if a country's economy is weak and many of its people are poor, the environment will also deteriorate. If the environment is damaged and resources are exploited and depleted in an excessive manner, the people will suffer and the economy will worsen.

The global community has realized that environmental issues are closely related to the economic and social conditions. This justifies that the social, environment and economic needs must be fulfilled in a balanced manner so that the fruits of development results can be enjoyed by future generations as well.

However, the challenges of the sustainable development are many. One of the most crucial issues is to find the ways to improve social welfare by using natural resources wisely so that the renewable natural resources can be conserved and non-renewable resources are utilized wisely and efficiently such that the needs of future generations will still be fulfilled.

Therefore, strategic steps are needed to preserve the environment along with the development process. The stages are as follows:

First, strengthening the understanding, awareness, and cooperation between various development agents of sectors in supporting the sustainable development.

Second, developing eco-friendly products, like they do in developed countries, where a product must be accompanied by an eco-friendly label (eco-labeling).

Third, restricting the issuance of business licenses relating to the exploitation of natural resources by paying attention to the environmental support ability of the licensee and the region.

Fourth, anticipating degradation of the environment and putting environmental repair cost to the price of product or services.

Fifth, enforcing laws that prohibit any violation of preservation of the environment.

Sixth, carrying out the development of renewable resources, such as agriculture, plantation, fishery, and tourism supported by quality human resources.

We need to stress the importance of development based on measured natural resources and their well-planned utilization so that the people's welfare will not be sacrificed. Projections and plans should be made as early as possible for developing renewable resources as a substitute.

Even if it is an important requisition in the sustainable development, the natural environment does not concern deep ecology which places the natural environment and its components in a separate interest from that of a human. Natural environment, after all, is a resource to be used for the benefit of mankind.

Since the sustainable development is based on three pillars (economy, environment, and society) the development must be holistic to create a synergy. This is why coordination is an important matter. With the development of democracy, there will be a higher chance of a balanced development of the three pillars. Pro-people development is not necessarily a sustainable development if it does not take the pillars of natural environment and socio-culture into consideration.

It is within the strategic context that education plays a very important role, not only in the transfer of knowledge, understanding and the awareness on the importance of sustainable development but also in the creation of technological innovations in order to provide eco-friendly products. The conventional development which exploits natural resources in an excessive manner is especially caused by the low quality of human resources and their ability to create technological innovations so that the resources are being sold as they are (as crude materials).

Using technological innovations, the natural resources can be engineered to procure larger value without excessive exploitation. This is one of the definitions of a knowledge-based economy (KBE) which possesses comparative advantages (ownership and control of abundant natural resources) turn into a competitive advantage. Only the education with scientific and technological visions can create human resources who are able to develop competitive yet eco-friendly products. This is why it is important to design education in accordance with the development of science and technology.

Chapter 2

Sustainability Education

Education is the most strategic sector in the national development. This is because the quality improvement of human resources as the subject of the development in order to participate in the process of achieving development visions can only be obtained through education. Education does not only bestow knowledge, but also the ability and attitudes as well as other skills required for every member of the society to actively participate in the development.

The Functions of Education

The macro perspective of the education functions includes human resource development, science and technology, and economic growth. Human resource is a highly essential factor in the development. This is due to a country's development requires not only the natural, materials, and financial resources, but also the human resources who have the capability to utilize the resources. It can be difficult for any development agency to achieve the expected goals and aims if the human resources, as the main factor, are not supportive or do not have the required ability to utilize the available resources.

It is evident that developed countries advance their economy, science, and technology due to quality human resources even though they lack natural resources. Japan and South Korea are among many

countries with fewer natural resources but they are equipped with high quality human resources. Japan with fewer natural resources has become one of the forerunners in the field of industry and economy, basing its development on human resources since the Meiji restoration to keep up with the other forerunners countries, such as Germany and the United States. Japan gave high priority to education for their human resources development.

On the contrary, many developing countries who are abundant in natural resources are still struggling with poverty because they lack of quality human resources. This is a common phenomenon among third world countries in Africa and Asia.

Thus, the lesson learnt from these countries is the importance of the role of quality human resources in the development process as well as in the improvement of people's welfare. Therefore, many countries are now giving high priority to human resources development through quality education. Those who have recently boosted their development through education include China, India, Malaysia, Thailand, and Singapore. These countries prioritize educational development by allocating quite a large amount of resources for education in their national budget, starting more than 20 years ago. Today they are experiencing its impact and are continuously improving their people's welfare.

A survey carried out in 1992 by the National Institute of Economic Review compared the investment in the development of quality of human resources in England, Germany, Holland, and France, showed that German level of productivity is higher than those of other three countries, mainly caused by higher investment in the quality of human resources (Megginson, Mattews, and Banfield, 1993). The result of a study carried out by the Commission for Improvement of Productivity established by the Massachusetts Institute of Technology (MIT) explained that American productivity rate is lower than that of Germany and Japan. This is so due to the

conditions of human resources at middle and lower skill levels. At this level, American people tend to be lazy, careless and spendthrift. Their training programs are less intensive than those of Japan and Germany. This finding showed that human resources are the key factor in a nation's productivity.

Education involves determining the relevant technique and strategy to change a person's behavior. Learning describes the process of interaction between individuals and their surrounding, including the trainer or instructor. Development is the gradual process of changes from incompetent condition to a competent one in a certain period of time.

According to Gilley and Eggland (1989), human resources development includes three missions. First, to enable the process of individual development, especially on performance improvement related to the assigned job. Second, to prepare for career development focusing on the improvement of performance related to the assignment of a certain position in the future. Third, to pursue organizational development for optimal usage of human potentials and improving their performance.

The dynamics of changes and competitiveness is inevitable. It is caused by the following:

1) *Changes in the economy*. Changes in the economy are a direct impact of global changes in the commercial system. In today's world, national boundaries in the field of trading are almost disappearing. As a result, traditional trade system will not be able to compete with the modern free trade system.

2) *Changes in science and technology*. The development of these two sectors causes high competition between nations, in production or distribution of goods and services. A nation's control power over science and technology will determine its development rate, especially in terms of economy. Therefore, in order to maintain

stable economic growth, and to improve it, a good mastery of science and technology is truly necessary.

3) *Changes in the socio-cultural field*. Globalization due to the development of communication technology causes changes in social and cultural aspects of life. This is because the unlimited flow of information results in an irrepressible adoption of a foreign culture. Since this adoption can be positive or negative, an effective filter mechanism is required, especially in the ability of every society member to sort out and choose.

With respect to science and technology, they have an important role in accelerating national development, as evident in a number of developed countries. As one of the economically-leading countries, Japan has proven that it can pursue advancement by means of improving its mastery over the development of science and technology. Japan's high economic growth after World War II was preceded by a reformation to prepare the nation for the twenty-first century. The reformation involved an overall review of the nation's socioeconomic system including the education system. Without the reformation, Japan could not have enjoyed the prosperity, self-reliance and high competitiveness that they possess today.

In order to carry out an economic reformation, Japan launched an incentive package of over 16 trillion yen or 120 billion US dollars. The incentive was directed towards expanding domestic consumption which emphasized on the renewal and renovation of social fundamentals and the promotion of science and technology development as well as improvement of information and telecommunication system.

The improvement of science and technology development and capability to apply them in a structured manner can reform the Japanese economy and boost the international economy. Its national policy involves making Japan a scientifically and technologically-oriented country. In implementing the policy, Japan accelerates its research and development (R&D) on infrastructure. Consequently,

the Japanese research and development improvement contribute significant influence on the social and economic advancement of the country.

In many cases, Japan is not the only country adopting mastery of science and technology as an important vehicle to accelerate the national development. Almost all developed countries have similar strategies. It is reasonable to say that the most important characteristics which differ the developed from developing countries is the infrastructures' improvement and the distribution or promotion of science and technology. These elements are the determining factors in terms of independence and the competitiveness of those nations in scientific, social and economic fields.

United States (US), as a developed country, even allocates a large amount of budget for the development of science and technology. For example, in 1985s the federal government allocated 7.6 billion US dollars for research of science and technology development related to the scientific and technological development of defense services. Over a half of this budget was granted to many universities. Furthermore, U.S. national industries specifically allocated funds for the development of science and technology, the amount of which was matched from the federal government-allocated grants. The mastery and development of science and technology in developed countries have become one of the determinant factors for their national development.

Within the context of globalization, human benefits from science and technology which have made life easier, and science and technology have become an important factor for the advancement of human life style and civilization (Bhagwati, 2004). Science and technology developed through the processes of research and development which require intellectuality, experimentation, and testing. In relation to this, education plays an important role in the development and realization of science and technology which are useful to the people.

The mastery and development of science and technology require a large amount of investment but it will yield high returns in the long-term. However, in most developing countries, especially in underdeveloped countries, the development of science and technology is still marginalized and has not yet become a national priority. This is due to the fact that most developing countries have not realized the importance of science and technology as the means for accelerating and improving the success of the national development.

In addition, budget in developing countries still gives priorities to programs related to the fulfillment of basic needs such as food, clothes, energy, housing, etc. The infrastructures and human resources training for the development of science and technology usually require large budget allocation, In this case, governments of developing countries often face the dilemma of priorities due to limited funding available.

Furthermore, most developing countries face problems related to the human resources availability. Human resources availability and its quality are critically important factors. In developing countries with rich natural resources, such as Middle Eastern countries, budget allocation for the development of science and technology might not be too difficult to handle. However, these countries still face problems related to the availability of human resources who master and have the ability to develop science and technology. Thus, the countries require priority programs related to the development of quality human resources who have the professional ability to develop science and technology in their respective countries. If this is not carried out well, the sustainability of long term development might encounter challenges, especially when the non-renewable natural resources are exhausted.

Globalization in every aspect of life which is triggered by the advancement of science and technology encourages countries to work harder in developing their science and technology. These attempts

result in international competition for development in all aspects. Mastery of science and technology among developed countries can accelerate the economic and national growth in those countries. The globalization era gave birth to a new paradigm in the field of economy known as a Techno-economic paradigm. Within this paradigm, technology becomes the most contributive factor in the improvement of living quality of a nation.

The implication of this paradigm is the economic transition from the resources-based economy into a Knowledge-Based Economy (KBE) or K-Economy. In K-economy, the strength of a nation is measured by its ability and mastery of science and technology as the primary factors of the economy rather than capitals, lands, and energy. This is due to the fact that its main characteristic is the use of advanced technology, entrepreneurship, and innovations which is supported by the development of science and technology.

Human resources for development must be prepared in a way to make them capable to grasp, master and apply science and technology to support the era of information and industrialization. This requires a reorientation of development and education paradigm with visions of science and technology, the political will of the government and the consistency of its implementation.

Science and technology-based development does not only accelerate the economic growth but also acts as a means to develop competitive qualities among countries in the world. In the past, the prosperity of a nation was usually seen as a result of control over an abundant amount of natural resources, energy, and human resources. A range of control and ownership of such resources gave comparative advantages over other countries that did not possess the same resources.

In the globalization era, comparative advantages are no longer a problem for countries that do not possess a large number of resources, because every country can acquire resources for their industrial and

development needs from various sources in an efficient and effective manner With the mastery of science and technology, a country can improve the strategic and economic value of a product so as to make it highly competitive.

Economists agree on the education's significant contribution towards economic growth. This theory is evident in a number of studies. The improvement of people's enrolment rate in education can accelerate economic growth. In a report to the President of United States through a conference on productivity held at the White House, Adam Smith, in the Wealth of Nations (1776) pointed out that the wealth of nations was very much determined by the quality of its work force. Human resources provide the basic foundation for productivity and productivity growth. Without a literate, skilled, healthy and motivated labor force, capital and technology cannot create a productive environment.

In relation to this, the result of a study conducted by Page (1993) showed a significantly positive correlation between the average education level and the economic growth. Research on subject countries indicated that average education level can reach a critical mass to a certain extent, making it one of the factors of exponential improvement of national income per capita. Therefore, education can be made as a means to improve economic growth.

In the context of economic growth, education is seen as an investment in human capital. This investment is expected to yield a return in form of certain benefits, for example, higher income gained by educated labor force through participation in the work market. The higher level of people's income with higher educational backgrounds is the key to understanding the relationship between investment in education and economic growth. This is based on the theory that every person has different effectiveness in performing his or her work. More effective human resources have higher productivity and output levels, due to the impact of education. So, the improvement of

effectiveness and productivity of human resources through acquiring education requires funds is categorized as an investment.

The important role of human capital whether in determining production output or in the context of economic growth, can be noted in the findings of various studies. Various studies carried out in the United States have proven that, out of the total GNP rate of 2.9 percent per year, 0.32 percent is caused by the accumulation of assets, 1.09 percent by the improvement of human resource productivity, and the remaining 1.49 percent by the development of technology. It shows that from the perspective of macroeconomics, investment on in human capital is very important for accelerating the national development or even to maintain economic growth.

Education has a significant relationship with income. The relationship between education and income can simply be described as follows: the higher the education level is, the higher the productivity will be. High productivity will generate a large income. This is in accordance with the theory of marginal productivity, under which salary is determined by a worker's marginal contribution towards the company's income. So, the more productive a worker is, the larger the income he/she will earn.

Many experts have conducted studies on the correlation between education and economic growth, especially using macro approach. Among the interesting finding is the study carried out on South Korea. The finding showed that the people's average education enrolment rate gave a significant contribution towards the country's economic growth, as can be seen from its Gross National Product (GNP) and Gross Domestic Product (GDP) as well as income per capita. Furthermore, the study indicated that in order to start the efforts of achieving a quite high economic growth, there has to be a certain period of time to attain a level of the educational level called critical mass. This critical mass is a certain level of education that must be reached as a prerequisite for high sustainable economic growth.

One of the important aspects of these studies is the human resources aspect. In this context, human resource is one of the input factors of a production system. Therefore, the level of ability possessed becomes the main indicator of a human resource. Since educational attainment level makes a significant contribution to such level of ability, a change in educational attainment level can also impact the human resources input quality.

An interesting indication in a country's employment situation is the imbalance between the number and competencies of the available workforce and the competence requirements of the work opportunities, resulting in structural unemployment. This is due to the transfer of human resources from subsistent sector to a remunerative technical sector does not run smoothly.

From a macro perspective, a number of studies that were cited in the previous section showed that GNP growth was driven by real contribution from the stock of abilities of human resources obtained through education. The contribution of education to economic growth can be found in the correlation between the improvement of human resources ability and the national output. The indicator used in measuring economic growth is the real GNP growth per capita, which has a high positive correlation with the growth of human resources productivity and reflects improvements in living standard.

Role of Education in Sustainability

Quality human resources hold a very important role in the implementation of sustainable development, due to the fact that development does not only give various positive impacts, such as economic growth and the improvement of people's welfare, but also negative impacts, such as deterioration and contamination of the environment. If human resources as the agents of development, whether as decision makers, policy makers or field agents are highly qualified, then the development will not be carried out merely for

the benefit and function of it, but also will be carried out wisely by taking many aspects into consideration, including the balance between economic benefit and environmental disadvantages. On the contrary, unqualified human resources will overlook many negative impacts of the development, resulting in an imbalance between the benefit of the development and the damages to the environment.

The quality of human resources can be seen from the abilities they possess in relation to their knowledge, skills or behavior. We can also identify human resources quality from their state of health and intelligence, that can cover intellectual, emotional, social or spiritual intelligence; morality reflected by their behaviors in interacting with other human beings and with the environment is highly essential as well as their liability. All of the indicators above are generally products of quality education. Quality education can be seen from the essence or substance of the education, facilities, and equipment owned, teaching staff, learning process and system and other factors contributing to the effectiveness and quality of the education.

Education for sustainable development, or sustainability education, means education with regard to the following sustainable development pillars as independent and interrelated dimensions: society, culture, economy, and environment, in an attempt to improve living quality (UNESCO, 2005). This is a dynamic concept as well as a collective attempt to look into the future when everyone will reap benefit from the opportunity to obtain education and to learn about important lifestyle, behavior, and values for the creation of a sustainable future.

As it is explained above, the background to the emergence of sustainable development concept is the environmental damages which are incurred due to the implementation of development which disregarded its negative impacts towards the environment. Most environmental issues occur due to lack of education on natural environments and about the ways to achieve sustainable living.

To enforce implementation of such concept, the 58th UN General Assembly in December 2005 agreed on the application of the Decade of Education for Sustainable Development (DESD) starting in the year 2005.

The basic vision of the decade is the achievement of a world where everybody has equal opportunities to obtain benefits from education for the sake of social transformation. One of its goals is to develop strategies at all levels to strengthen ESD's capacity. The DESD reinforces other UN programs, especially the Education for All (EFA) and the Millennium Development Goals (MDG). Article 36 of Agenda 21 underlined the importance of reorientation of education towards sustainable development. These include all types of formal and non-formal education as well as all key issues related to education for the sake of sustainable human development.

The Decade of ESD 2005-2014 was established for the following purposes:

1. To promote education as the basis of sustainable social life and to strengthen international cooperation for the development of policy innovations, programs and the implementation of ESD.
2. To integrate sustainable development into the education system at all levels of education.
3. To provide funds and support for the education, research, and public awareness programs as well as the development of institutions in developing countries and countries undergoing economic transition.

In order to implement ESD, the government in each country must pay attention to self-reliance in carrying out its country's development. It includes the following three aspects:

1. Community-oriented. Development which is based on the needs of the local people;

2. Community-based. Development is based on the local resources available to the local society: human resources, natural resources, economic-social-political institutional resources as well as the supporting values.
3. Community-managed. Development involves the local society starting from the planning stage up to the implementation and outcome of the activities, which gradually shifts the local people's position from object to subject of development.

During the launching of International Education Decade for Sustainable Development in March 2005 in New York, Koichiro Matsura, Director General of UNESCO stated that education for the sustainable development must not be a mere logo or slogan. It must be a concrete reality for us all, whether to individuals, organizations or governments, in every action and decision we make every day. That way, we can ensure a sustainable planet and a safer world for our children, our children's children and so on. Therefore, education becomes the most important element of the Sustainability. Its shall be carried out with the purpose of giving the required understanding, skills, and values for sustainable social life.

The concept of education for sustainable development includes a new education vision with an attempt of empowering people of all ages to participate in creating a sustainable future. It is an integral part of achieving the three pillars of human development, as suggested by the United Nations Development Program (UNDP) and enforced in the World Summit for Sustainable Development in Johannesburg in 2002.

The three pillars include economic growth, social development, and preservation of the natural environment. Cultural element is also identified as the basic theme essential to the education for sustainable development. It considers the importance of education for sustainable development involves the stakeholders and new partners in a local relevant framework.

This concept is not necessarily similar in meaning with that of education on sustainable development which is merely a transfer of knowledge. Education for sustainable development is related to the attempts of changing our behavior and lifestyle for positive transformation of the society. This concept is different from environmental education. Environmental education is one of the components for sustainable development It is related to a study discipline focusing on the relationship between human being and its surrounding and how to preserve and conserve the environment.

The application of this concept involves socio-cultural and sociopolitical issues, including equality of rights, poverty, democracy and life quality. The theme includes various subjects such as education for the eradication of poverty, human rights, gender equality, democracy and good governance. Through the themes, the learning goals become so vast that must be integrated into various school subjects, in school, and in university.

In the implementation, different theories are circulating, even if the theories are not so different from one another:

1. Development Education. The development education focuses on the issues of human rights, human dignity, self-ability and social justice in developing countries and third-world countries. This concept pays attention to the impacts of the sub-standard development and increases the understanding about which components are contained in a development. In addition, it aims to achieve the pathway to international social and economic order.
2. Education for Sustainable Development. There are two terms related to this, namely, sustainable education, and Education for Sustainability. The first term was mentioned in Chapter 36 Agenda 21 (1992 Earth Summit in Rio de Janeiro). This chapter identifies four main purposes for starting ESD concept: (1) to improve primary education, (2) to redirect the existing education for the purpose of sustainable development, (3) to develop the

social awareness and understanding and (4) to train. The second, education for sustainable development is a combination of environment education and development education. The concept enables people to develop their knowledge, values, and ability to participate in decision making concerning how to behave well in personal or collective manner, locally or globally, in order to improve the current living quality without destroying or damaging the future.

3. Education for Sustainable Future (ESF). Education for Sustainable Future was the theme of an international conference held in Ahmadabad, India in January 2005. It was the first conference which marked the education decade for sustainable development by the UN. The three-day event did not only discuss what we can do in this decade to redirect the visions of development, and how the educators can facilitate this process but also places the idea of ESD action in 20 sectors through the separate workshop. Declaration from the International Conference on Education for a Sustainable Future, 18-20 January 2005, Centre for Environment Education, Gujarat, India.

4. Environmental Education. Environmental Education refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behavior and ecosystems in order to live sustainably (Wikipedia, the free online-encyclopedia, 01.26.06).

5. Global Education. There is no standard definition of theory or practice of this concept. Two possible descriptions: First, Global Education concerns issues of cross-national borders and the interrelationship of system, ecology, culture, economy, politics, and technology. Global education sees things through other people's eyes, mind or heart. It means that an individual or a group must see the world differently since they have similar wishes and needs. The global education elements consist of:

a. Awareness and appreciation of the other sides of the world

b. Cross-cultural awareness includes general understanding in defining the characteristics of cultures around the world by focusing on equality and difference.

c. The awareness of the existence of other countries on this planet, including a profound understanding of global issues.

d. Systematic understanding, which is defined as closeness to a natural system and the introduction to a complex international system where all aspects will be connected to each other in a dependency pattern and internal dependency in certain issues.

6. Peace Education. Peace Education may be defined as the process of acquiring the values, the knowledge and developing the attitudes, skills, and behaviors to live in harmony with oneself, with others, and with the natural environment. This is according to the philosophy which teaches peace, anti-violence, love, compassion, trust, justice, cooperation, respect and appreciation for every human being and living thing on Earth. This is a social practice with sharing values where everyone can give a significant contribution.

Based on this, education should:

1. Provide abilities that enable the participants to have forward views to anticipate and solve all life-threatening problems on this planet.
2. Understand the concepts and weigh the values as well as principles for sustainable development such as:

   a. Equality of rights and opportunities between generations

   b. Tolerance and difference

   c. Protection and restoration of the environment

   d. Conservation of natural resources

e. Peaceful and just people
f. Gender equality
g. Eradication of poverty

3. Identify the complexity and interdependency of social, cultural, economic, and environmental dimensions in the sustainable development.

One of the most important outcomes of Earth Summit I in Rio de Janeiro in 1992 is a common agreement on the importance of education in executing eco-friendly development and to improve human understanding on the development and environmental issues. This was further underlined in Earth Summit II in Johannesburg in 2002, but with an even larger vision, where education plays an essential role of not only to achieve eco-friendly development but also to create social justice and eradicates poverty. The Johannesburg Summit then recommended UN to create the education for sustainable development program.

As a further measure, during the 57th annual meeting in December 2002, UN legalized a resolution (57/254) concerning the launching of Decade of Education for Sustainable Development program beginning in January 1st, 2005 until 2014. UNESCO was then assigned as the key organizer who is responsible for promoting and compiling the implementation draft for this program. The vision is to create a world where every living being has equal opportunity in obtaining education and learning norms, behaviors and living style required for sustainable future and social transformation process.

The relationship between human beings is often based on personal interests (greed, cravings for power, etc.), resulting in unequal distribution of welfare and in conflicts due to the scarcity of natural resources. On the other side, justice, peace, relationship based on common interest calls for the values of equity, respect, and understanding.

Sustainability requires respect for human rights as well as a commitment for social and economic justice, respect for the rights of the future generation, as well as commitment and responsibility between generation, respect for and awareness of community life with all of the diversity involved, including conservation of the ecosystem as well as the commitment to create the culture of tolerance and non-violence.

Implementation of Sustainability Education

Education within the perspectives of sustainability basically teaches values as mentioned above. With education, human can understand themselves and other creatures as well as their relationship with the natural environment and wider social environment. Education teaches the value of appreciating other creatures, the value of understanding diversity and difference as well as justice, responsibility and tries to bring out dialogues on the subjects. That is why education can be an important means to promote the values in order to achieve sustainable development.

Several types of roles the education plays in achieving sustainable development: (1) education is the inspiration for the creation of belief that every person has the ability and responsibility to make positive changes, (2) education is the main factor in the process of transformation towards sustainable development and in improving every person's ability to transform their vision into reality, (3) education can nourish norms, behavior and living style required for sustainable future, (4) education is a learning process on how to make decisions that take justice, economy and ecology of all communities into long term consideration, (5) education can build the ability to think in the long term.

The issues of sustainable development are multidimensional in nature. It does not depend on education, but also rely on other social aspects at hand, such as government, type of economic organization,

and participation of citizens. Within the sustainable development, learning activity becomes an important factor. It is not only carried out in the formal and non-formal education system but also in daily life at home, in a community or at the workplace.

The goals of sustainability education can be articulated with a different way in various places, from local to global scope. Generally there are five global targets to be achieved: (1) to provide an understanding on the importance of education and learning to achieve sustainable development, (2) to form a network, trade and interaction between stakeholders of this program, (3) as a media to promote the vision and the transition process towards sustainable development, (4) to improve quality of learning on sustainable development, and (5) to develop a strategy to strengthen the capacity of education for sustainable development.

Since this constitutes a global awareness, the message is directed to all developed and developing countries. In its implementation, every country must define their own priorities, goals, and action programs which must be adjusted to the local environmental and socio-economic conditions. Furthermore, the resolution of several issues requires international cooperation, such as climate change and biodiversity issues.

The values expected from this program come in the forms of awareness, behavior, and norms that may inspire or become the basis for the community to achieve a sustainable development. The narrowing of concept and program planning requires all types of education, formal or non-formal, to apply practices and approaches which will contribute to a new order of sustainable development.

Sustainability education can become a learning process on how to make a decision which takes the economy, ecology, and social equality into consideration for the long-term. However, this requires a new vision of education. A vision that helps us to understand the world better, understand the complexity and interconnectivity of

various problems, such as poverty, environmental damage, population growth and health issues that may endanger our future.

In viewing the sustainable development, new visions of education emphasize the holistic and interdisciplinary approaches, values-driven, multi-pronged methods, participative in nature and encourage people to think critically and solve various problems. These require education institutions that can reorient the system, policy and educational practices which can support people to take measure and make decisions according to the local condition in handling various issues that may potentially harm their future.

Educational reorientation, from primary education to university, which clearly focuses on the development of knowledge, skills, perspectives, and norms related to the sustainable development, becomes very important for present and future generations. Reviewing the objectives, contents and teaching method of the existing curriculum is required in order to develop a trans-disciplinary understanding in viewing social, economic and environmental issues.

Awareness of such matters should be introduced since childhood up until adulthood by putting these subjects in the curriculum and syllabus of every school subject. The biodiversity resources, in addition to the natural resources are also assets for sustainable development which must be introduced to students through formal or non-formal education.

At higher education level, the level of understanding of sustainable development must also be larger and more complete. Education on ecology or control of waste must be given in every subject and integrated into the general college subject given to all students from all majors. Since it is general and multidisciplinary in nature, the delivery must also be carried out using a simple and popular language.

Understanding of waste and pollution (land, water, and air) can be integrated into a particular subject, such as combustion engine

subject for students of technical engineering. In addition to explaining the mechanism of car machine, it should also explain the negative impacts of reckless fuel consumption. Hospital waste processing must also be taught to medical and hospital management students. The environmental economy subject is also recommended as one of the subjects that every economy student needs to learn. These are examples of how educational programs for sustainable development must be integrated into university curricula.

The implementation of this particular education program is integrated into resolution number 57/254, that was the result of UN Plenary Meeting which proclaimed the Decade of Education for Sustainable Development 2005-2014 in December 2002. UNESCO was assigned as the coordinator of this decade program, initiated consultations with various parties in 2003 with the intention of preparing the International Implementation Framework (IIF) for this program. This program is implemented locally, nationally, regionally and internationally. IIF fulfilled the two concerns stated in the UN Plenary Meeting, about how to encourage governments to enliven the Decade and build public awareness so that all can contribute to the program.

In relation to the DESD, UN formulated the concept as follows:

1. DESD is an education which enables human to see, face and solve problems which threaten our life on Planet Earth;
2. In the context of ESD, education delivers values and principles acting as a basis for sustainable development (justice between generations, gender equality, social tolerance, eradication of poverty, protection and recuperation of the environment, conservation of natural resources and peace in the society);
3. DESD also means that the education highlights on complexity and interdependency between three components: environment, society-including culture, and economy (UNESCO, 2005).

All of these are the challenges that must be addressed during the implementation of the Decade program. The more specific aims of the program include: 1) to help improve the quality of education and learning through ESD; 2) to help countries to achieve advancement in order to achieve the Purposes of Millennium Development through the efforts made by ESD; 3) to give new opportunities for countries to integrate ESD into the reformation of their educational system; and 4) to facilitate the establishment of the network as well as interaction among stakeholders of the ESD project.

In order to achieve all of the above purposes, all stakeholders should try to:

1. promote and improve the quality of education: the purpose will be more focused on the lifelong education in order to obtain the knowledge, skills, and values required by the society in order to improve their living quality;
2. redirect the curriculum: starting from pre-school to university, education must be reviewed and reconstructed to become a vehicle for knowledge, way of thinking and values required to build a sustainable world;
3. improve public awareness on sustainable development concept: improving the awareness will make it more possible to produce citizens who understand, active and responsible locally, nationally and internationally; and
4. educate workers: sustainable technical and skills education for directors and workers, especially those working in the fields of industry and commerce, so that they will be able to adopt sustainable production and consumption patterns.

Education within the perspectives of sustainability basically teaches values as mentioned above. Through education, humans can understand themselves and other creatures as well as their relationship with the natural environment and wider social environment.

Education teaches the value of appreciating other creatures, the value of understanding diversity and difference as well as justice, responsibility and tries to bring out dialogues on the subjects. That is why education can be an important means to promote the values in order to achieve SD.

Since this constitutes a global awareness, the message is directed to all developed and developing countries. In its implementation, every country must define their own priorities, goals, and action programs which must be adjusted to the local environmental and socio-economic conditions. Furthermore, the resolution of several issues requires international cooperation, such as climate change and biodiversity issues.

Educational reorientation, from primary education to university, which clearly focuses on the development of knowledge, skills, perspectives, and norms related to the SD, becomes very important for present and future generations. Reviewing the objectives, contents and teaching method of the existing curriculum is required in order to develop a trans-disciplinary understanding in viewing social, economic and environmental issues.

The awareness of such matters should be introduced since childhood until adulthood by putting these subjects in the curriculum and syllabus of every school subject. The biodiversity resources, in addition to the natural resources, are also an asset for SD which must be introduced to students through formal or non-formal education.

At higher education level, the level of understanding of SD must also be larger and more complete. Education on ecology or control of waste must be given in every subject and integrated into the general college subject given to all students from all majors. Since it is general and multidisciplinary in nature, the delivery must also be carried out using a simple and popular language. Understanding of waste and pollution (land, water, and air) can be integrated into a particular subject, such as combustion engine subject for students

of technical engineering. In addition to explaining the mechanism of car machine, it should also explain the negative impacts of reckless fuel consumption. Hospital waste processing must also be taught to medical and hospital management students. The environmental economy subject is also recommended as one of the subjects that every economy student needs to learn. These are examples of how educational programs for SD must be integrated into university curricula.

Since 2015 through 2030 every UNESCO member country has been entering Global Action Program (GAP) achieving sustainable development goals (SDGs). The GAP will focus on five priority action areas, covering:

1. Advancing policy;
2. Integrating sustainability practices into education and training environments (the whole institution approaches);
3. Increasing the capacity of educators and trainer;
4. Empowering and mobilizing youth; and
5. Encouraging local communities and municipal authorities to develop community-based ESD programs.

Besides, there are 17 goals the ESD is to achieve during the global action program, 2015-2030, namely: 1) no poverty, 2) zero hunger, 3) good health and well-being, 4) quality education, 5) gender inequality, 6) clean water and sanitation, 7) affordable and clean energy, 8) decent work and economic growth, 9) industry innovation and infrastructure, 10) reduced inequality, 11) sustainabilities and communities, 12) responsible consumption and production, 13) climate action, 14) life below water, 15) life on land, 16) peace, justice, and strong institution, and 17) partnership for the goals (UNESCO, 2015).

In fact, SD by itself is unsustainable unless all stakeholders concern and have the commitment to its implementation. Sterling

(2014) explained, "Sustainable development is not itself sustainable (i.e., lasting and secured) unless relevant learning among all stakeholders is central to the process" (p. 93). This is due to the fact that education improves competencies. Therefore, in its implementation it requires "...long term and systems thinking, dealing with complexities and working in partnerships. It also entails specific knowledge related to areas of ones' personal and professional life that impact local and global communities and ecosystems" (Fadeeva, Petry, and Payyapppalimana, 2012, p.8).

This also needs to identify the type education and instruction that improve this particular competency. Ohman and Ostman (2008), explained:

> Thus, from this practical perspective, fulfilling the intention of the education for sustainable development policy documents basically means to offer various kinds of situations where students can display, and experience others displaying, what they regard to be the correct way of acting and the values they believe in. In this way, opportunities are created for students to increase their sensitivity to the subtle nuances of language when it comes to communicating the ethical tendency (p. 66).

In order to develop the related curriculum, it needs to develop an effective teaching-learning strategy, as well as its evaluation (Pruneau, Lang, Kerry, Fortin, Langis, and Liboiron, 2014). Its curriculum implementation should emphasize on practical experience in order to cultivate awareness, attitude, and value system toward sustainable development (Akker, 2006). This requires every education institution (at all levels) to reorientate its system, policy, the education practice aimed at encouraging the students to make the proper decision on tackling the future threats (Ali, 2015). This is in line with Cincera (2013), "According to our experience, it seems to be reasonable to use experiential education as a theoretical background for ESD programs", (p.35).

For this regard, the curriculum should be formulated in thematic forms related to three types of competencies, i.e., "... learning and innovation skills, information, media, and technology skills, and life and career skills" (p. 48). Furthermore, according to Baiquni and Astuti (2015), the key to success of ESD teaching and learning is the critical learning, joyful learning, and competitive learning on environment betterment; and these need a long term and various learning process.

Chapter 3

Sustainability Education Curriculum

The implementation of sustainability education, just like that of any other education field, is based on the curricula that can be used in schools. In the countries which use standard base education, the curriculum is developed based on its national education standard. It is aimed that every citizen, regardless schools where they learn, has the opportunity to gain a similar learning experience.

Given the curriculum that is used as a guide to the implementation of education, we can get the impression that the existence of the curriculum is a plan of the type of expected learning experience to be obtained by students during the education at the school. The plan is sometimes only formulated in the forms of lessons, goals to be achieved, or fully formulated in various aspects related to the learning experience that will be obtained by students during the education at the school.

In the curriculum which is developed based on the national education standards, the existence of every subject in the school curriculum, or syllabus, consists of core competencies and basic competencies. The core competencies are related to the national

standard, while the basic competencies are the elaboration of the core competencies and are related to certain knowledge, skill, and attitudes. These competencies are further formulated by the teachers into learning materials, mode of teaching learning processes, and assessment technique accordingly.

Recently, sustainability education becomes one of the education programs that every UNESCO member country should implement. In regard to the implementation of the program, curriculum needs to be developed. Prior to its development, we need to be clearer on the nature of of curriculum. So, it is beneficial for us to begin with definition of curriculum.

Various Meanings of Curriculum

The curriculum is an essential plan that guides teachers or practioners in organizing the educational process. What is set forth in the plan is much influenced by the planner's viewpoints of the existence of education? While the view of the existence of education is affected by educational philosophy embraced by planners.

Prior to the twentieth century, the term curriculum has not been widely used in the context of education. Experts noted that the concepts of curriculum began to flourish since the publication of The Curriculum 'book written by Franklin Bobbit in 1918 (Saylor, Alexander, and Lewis, 1981). Since the advent of his writings, other writings of curriculum have emerged, resulting in various views and concepts about the curriculum.

The emergence of various meanings about the curriculum has an impact on the emergence of various formulas of understanding of the curriculum terms. From various formulations of these definitions, there are some elements which have similarity and differences that can be put into a category. Saylor, Alexander, and Lewis (1981) categorize the definition of curriculum, namely:

1. Curriculum as a plan for lessons or lesson materials.
2. The curriculum as a plan for the learning experience.
3. Curriculum as a plan for the learning goal to be achieved.
4. Curriculum as a plan for learning opportunities.

In these four categories, the authors see the existence of two categories that are actually complementary to each other, namely the curriculum as an educational objective and as a learning plan. In this context, the goal of education is the basis for planning learning activities. Therefore, the authors create a category of curriculum definition into:

1. Curriculum as a lesson plan or teaching materials.
2. The curriculum as a learning experience.
3. The curriculum as a learning plan.

Curriculum as a Lesson Plan

Traditionally, the term curriculum is defined as a plan on the number of subjects or teaching materials offered by an educational institution to be learned by the student. This formulation of understanding is so popular that Webster's New International Dictionary, which has included the term curriculum in English vocabulary since 1953, gives meaning to the term curriculum as follows:

a. A course, especially a specified fixed course of study, as in a school or college, as one leading to a degree.
b. The whole body of courses is offered in an educational institution, or a department there of.

The above definition, defines the term curriculum: 1) as a number of lessons set for study by students in a school or college, to obtain a diploma or degree, 2) the overall subjects offered by an educational institution or a particular department.

The first one is very common in the world of education. Even today this understanding is still widely used, especially in various universities. This phenomenon shows that there is still higher education institution whose curriculum only contains a list of subjects offered to be studied by the students in completing education in college.

The use of aforementioned curriculum definition formulas brings the impact of the existence of education in schools. The most prominent impact that can be identified is the clear distinction between what is included in the curriculum, the extra-curriculum, and co-curriculum. What belongs to the curriculum are all subjects that have been determined to be studied by students. Students' activities of studying the various subjects are associated with curricular or intra-curricular activities. Activities other than studying the subjects or teaching materials listed in the curriculum are not included in the curriculum.

In fact, in the process of education in schools, we can recognize the existence of various activities that are very useful in supporting the process of student personality formation. Those activities are outside the activities of learning the subjects included in the curriculum. In relation to traditional curricular notions, such activities may occasionally be included in extra-curricular or co-curricular activities.

When those activities are regarded as being loosely linked to the curriculum and implemented outside of the time allotment in the curriculum, such as sports and scouts, such activities are often referred to as extra-curricular activities. If the activity is directly acknowledged to support the achievement of curriculum objectives, such as lab work, it is known as co-curriculum or co-curriculum.

Curriculum as a Learning Experience

The second category of curriculum is considered as the overall learning experience that students gain on school responsibilities.

These learning experiences can take the form of studying subjects, as well as other activities that are thought to provide a learning experience that is memorable.

On the basis of this understanding, activities that are in accordance with traditional curricular notions are regarded as extra-curriculum and co-curriculum, based on this definition, included in the curriculum. In addition, learning activities are not limited to learning activities in the classroom or in the school building solely, but those include activities that are done outside the classroom or school; based on the school's responsibility (Romine, 1954).

It seems that the above meaning is influenced by earlier views, such as Stratemeyer, Forkner, and McKim (1947), which states that "courses and class activities in which children and youth engage; the total range of in-class and out of class experiences sponsored by the school; and the total life experiences of the learner ".

The aforementioned scholars define the curriculum in three ways: 1) Subjects and other activities conducted in the classroom. 2) Entire learning experience, both obtained from within and outside the school supported by the school. 3) All life experiences of students.

The above definitions explain that the curriculum covers a fairly broad aspect, covering the entire student experience. Why so? The expert view that education is in charge of preparing students to function and adapt to all aspects of life in society. Therefore, schools are responsible for providing a comprehensive and authentic learning experience to the students. These learning experiences are not limited to studying the subjects only, but also the values system prevailing in society, customs, manners, the ways of dealing with others, and other aspects of life. All of this, according to them, should be obtained by students from schools, and for that school needs to prepare it for the curriculum.

In addition to studying the aspects of life as described above, students are also given learning experience associated with learning

the results of the mind, creativity, and creation of others, whether collected in the materials, as well as cultural lessons. So, by doing various activities, social interaction in the school environment, working with fellow students in group activities, and even by interacting with the physical environment, such as school buildings, classrooms, and circumstances around the school, students gain a variety of learning experiences and experiences life. This whole experience is covered in the curriculum according to the above insights, so

Thornton and Wright (1964) concluded that the term curriculum is used to show to all student learning experiences gained under the direction of the school. Tanner and Tanner (1980) make a more detailed formulation, which is the elaboration of the curriculum definition formula as a learning experience. They stated that the curriculum includes: "... 1) the cumulative tradition of organized knowledge; 2) modes of thought; 3) race experience; 4) guided experience; 5) a panned learning environment; 6) cognitive content and process; 7) an instructional plan; 8) instructional ends and outcomes; and 9) a technological system of production "(p 36).

This definition explains in detail that the curriculum encompasses organized knowledge, mind modes, racial experience, integrated experience, a planned learning environment, cognitive/affective content and processes, teaching plans, objectives and teaching outcomes and a production technology system.

The above definition formulas view the curriculum not merely what is planned, but also the results achieved as the product of the plan itself. When examined closely, this formulation includes a broader aspect, because what is produced is influenced not only by the plan being made but also by how the plan is implemented. So, this kind of understanding can be seen as too broad. According to Taba (1962), too broad definition would be less functional to be applied in practical situations.

Curriculum as a Plan for Learning

Both categories of curriculum definition formulation as stated above have limitations in its application. In the first formulation, the limitations of its application lie in the narrowness of coverage. In the second formulation, the limitation lies in the ineffectiveness of the concept to be applied in the context of planning. Meanwhile, the third category offers a more rational and functional alternative, so that it can be applied in practical situations.

The definition of the curriculum included in this category is the learning plan, which is what the curriculum planner wants the students to learn in the school. In the learning plan, the objectives to be covered, the type of experience/material learned, the organization of the activity, and how to judge its success. In order for a planned plan of learning to function, it is necessary to consider related concepts, i.e, the concepts of learning psychology and developmental psychology.

According to Taba (1962), "A curriculum is a plan for learning; Therefore, what is known about the learning processes and the development of individual bearing on the shaping of a curriculum "(p.11). The curriculum is a plan of learning, therefore the concepts of individual learning and development can affect the forms of the curriculum.

As has been explained before, the learning plan includes goals, materials, organization activities, and assessment of the learning. The goal to be achieved is the basis and reference in planning other elements. This is in line with the concept that is often used in business management and industry, which is famous for management by objectives.

The application of the concept of management based on objectives in the curriculum was first expressed by Franklin Bobbitt.

The procedure he uses in developing curriculum by applying this concept is by formulating objectives. These objectives are formulated based on the results of his research on the types of knowledge and skills required by adults. On the basis of these objectives, formulated learning experiences in the form of abilities that students should have in their later life as adults (Saylor, Alexander, and Lewis, 1981).

The Bobbit procedure was further systematized by Ralph Tyler. In the book 'Basic Principles of Curriculum and Instruction' first published in 1949, Tyler (1970) put forward the principles of curriculum and instruction planning. According to him, the principles of curriculum planning are the same as teaching planning. If someone is going to plan curriculum or teaching, there are four questions that should be asked:

1. What goals do you want to achieve?
2. What learning experience should be prepared to achieve that goal?
3. How are the learning activities organized?
4. How to assess the success of goal achievement?

Nowadays, the concepts about the curriculum are separated from teaching, so curriculum and teaching are two different things. This distinction has an impact on the activities conducted in the planning of the curriculum and the planning of the teaching. The curriculum deals with learning plans at a broader level, while teaching is related to the learning plan for the implementation of the curriculum. However, in the process of schooling, curriculum and teaching are closely related, and both support each other to achieve the educational goals.

The concepts of the curriculum can be used as guides to determine which curriculum forms are prepared. Differences in the concepts that are held may result in differences in the curriculum itself (Mc Neil, 1981). Various concepts about curriculum arise because of the different concepts of school functions. According to

Taba, the educational function of the school can be categorized into three types, namely 1) as the keeper and transmitter of culture, 2) as a cultural transformer, and 3) as the developer of children's character (Taba, 1962).

The traditions and culture of a society have deep roots in the lives of the people who have them. In general, people want the tradition and culture to be preserved and preserved so that it is not destroyed. Formally, the conservation is done through educational institutions i.e. schools. Through education in schools to students who are the next generation, it has been delivered the traditions and cultural heritage of the ancestors, both through formal teachings or through daily interaction. The conservation of tradition and culture is a task that must be done by the school.

Among the sharpest criticisms of the first concept of school function is that human life is always evolving. Similarly, the traditions and cultures which are the product of human creativity. Reality shows many societies not only survive in a particular culture but also receive the other cultural pattern. This is due to the dynamics of culture itself as well as by the influence of the development of the thinking ability of the community.

On the basis of that, then education functions as converter or transformer of the culture. According to this concept, schools as formal educational institutions are a way to transform cultures into a more advanced pattern, either by developing the original cultural forms of society or through the process of receiving selective outside cultural influences.

The above two concepts when examined from the point of the psychological study is seen the only emphasis on the interests and needs of society in general, by ignoring the aspects of the psychological needs of students who are individual. Such circumstances can be detrimental to the development of student personalities because each individual student has different psychological needs. On this basis,

the education should function to develop the individual personality of the students.

Various Views on Curriculum

The curriculum, as a plan that guides for conducting the process of education in schools, has different forms as a result of the different concepts of education. Oliva (2005), explained that there are three different views on curriculum, namely, the curriculum which is based on its purpose, its context, and the one that is based on the teaching-learning strategy.

Based on its purpose, curriculum is considered as the means to develop the students' intellectual capacity or as to transmit the cultural heritage. Based on its context, curriculum is the means for the students' preparation of their future life. Based on the teaching-learning strategy, it is connected with a strategy of teaching and learning in such the way that students are capable of learning effectively.

The traditional concept \ of the curriculum refers to a body of subjects or subject matter prepared by the teachers for the students to learn. It was synonymous with the course of study and syllabus. The curriculum is viewed as permanent studies where the 3 Rs are emphasized on basic education and college education should be grounded in liberal education.

On the other hand, essentialist believe that the mission of the school should be intellectual training. Hence, the curriculum should focus on the fundamental intellectual discipline of grammar, literature, and writing. It should also include mathematics, science, history, and foreign language.

McNeil (1999) categorizes the curriculum concepts into four kinds, namely (1) humanistic curriculum concepts, (2) technological curriculum concepts, (3) concepts of social reconstruction curriculum, and (4) academic curriculum concepts.

Humanistic Curriculum

The concept of the humanistic curriculum views the curriculum as a tool for developing each individual student. The curriculum should give every student the opportunity to realize themselves in accordance with their potential. The objectives of the curriculum should emphasize on the aspects of individual development, integrity, and autonomy. The objective is viewed as data to be a means to manifest itself.

The concept of the humanistic curriculum is influenced by the concept of the function of education for personal development.,It is also rooted in the concept of humanism psychology, such as the concept proposed by Abraham Maslow. Maslow's concepts emphasize on the study of hierarchy of individual needs. The concept views that each individual has needs that need to be met. The needs move from the most basic needs to the highest needs.

Each type of need must be met and the successful need fulfillment will motivate the individual to meet the needs on the level above. The most basic needs are physical needs such as eating, drinking and sleeping. Needs at the advanced level cover the need for a sense of security, the need for love or a sense of acceptance by the group, the need for a sense of respect, and the highest need is the need for self-realization or self-actualization.

The educational task related to this concept is to assist the individual in the effort to achieve the self-realization, through exploring the students' potentials. Therefore, the school curriculum should be prepared by observing the harmony between personal development and cognitive development simultaneously. Curriculum Implementation which is especially related to teaching and learning processes should be able to motivate students to do something according to their individual needs. In this case, education is not merely giving, but it encourages students to do or do something.

The concept of humanistic curriculum gives birth to a child-centered curriculum. In this kind of curriculum, each student has the opportunity to learn according to their own interests and needs. The substance or figure of this kind of curriculum almost does not seem as clear, but rather a learning plan that is shared between the child and the teacher. With an emphasis on the importance of paying attention to the interests and needs of students individually, each student with the help of the teacher makes a learning plan in accordance with the interest and needs.

Curriculum as a Social Reconstruction

This curriculum concept emphasizes the importance of the curriculum as a tool for reconstructing or redrafting the lifestyle and culture of the community. In the curriculum, there is a plan that deals with how to restructure people's lives to a better-regarded order. This order includes the social, political, economic, mental, and spiritual aspects. Through the process of education in schools which is the implementation of the curriculum, students are invited to recognize the various problems that appear in the community, in accordance with the level of thinking ability, then try to find alternative solutions.

The impacts of applying the curriculum concept as a social reconstruction are (1) for the purposes of the preparation of the curriculum, needs analysis should be conducted, (2) on the basis of the needs, the priority can be identified, (3) the education process emphasizes the problem-solving activities, and (4) the community can be used as a learning resource.

In the curriculum preparation, needs analysis identify kinds of needs felt by the community that can to improve their standard of living. Based on recognizable needs, a priority scale is set, i.e. what needs are deemed most important to be pursued. Based on what is prioritized, students are invited to recognize and solve the problems encountered, by making the community as a source of their learning.

The concept of the reconstructionist curriculum gives a birth to a curriculum-centered activity. School curricula do not provide specific subject-specific courses but provide the possibility for students to plan specific activity projects. Therefore, this kind of curriculum is also called project curriculum. The purpose of all activities undertaken is to provide the experience of learning as much as possible directly in the life of society. The practice of this kind of curriculum is often referred to as the curriculum of experience. The main learning method used in the implementation of this curriculum is the problem-solving method.

Curriculum as Technology

The term technology is meant here is a system approach to solving practical problems in life. This concept considers that the curriculum is a system developed by system approach. As a system, the curriculum has a number of interdependent components and interrelationships in the effectiveness of achieving the goals. Therefore, curriculum development using the system approach starts from the formulation of the objectives to be achieved. Based on the objectives, learning materials, learning activities, and tools for assessing the achievement of the objectives are selected and formulated. Such methods and tools are seen to lead students to reach the goal.

The concept of the technological curriculum does not produce certain forms of curriculum, such as a child-centered curriculum or an activity curriculum. This concept emphasizes more on the design of teaching and learning system based on the approach system. Its application in educational practice is reflected in the application of individual teaching systems. In this individualized teaching, each student can choose his own learning materials, which can be learned on their own. Thus, each student can learn according to his or her potential, so that every potentially high student can learn and master the lessons faster than the potentially inferior students.

The curriculum designed with reference to this concept is a learning package that can be studied individually.

Academic Curriculum

Awareness of the importance of improving the progress in the field of science and technology produce the concept in which the curriculum becomes a tool to produce individuals who have the high intellectual ability through educational processes that can foster cognitive development. Elliot Einser and Elizabeth Vallance in the book 'Conflicting conceptions of curriculum' put forward the concept that a curriculum is a tool for developing cognitive abilities (McNeil, 1999).

The curriculum development process is done by planning activities to learn the materials, such as studying the eyes of the traditional curriculum. However, not all learning materials are taken from a number of subjects that were made into curriculum content. A careful selection of the content is conducted on the basis of the structure of a particular discipline.

The core materials of a discipline are the basic ideas of such a discipline. Bruner (1960) termed the core material as a disciplinary scientific structure. To study structures effectively in supporting the development of cognitive processes, discovery or inquiry methods is used in the teaching-learning processes. The concept of an academic curriculum produces a subject-oriented curriculum. The materials that become the contents of the curricula are selected from the related disciplines that are deemed to improve the ability to perform the cognition process. Bruner (1960) proposed this form of academic curriculum in a form of spiral curriculum. The curriculum consists of a number of disciplinary structures, repeatedly studied by students at various levels of school with different depth and width depending upon school level.

Another form of curriculum born under the concept of academic curriculum is the core curriculum. The core curriculum contains subjects and lesson materials that are fundamental and most important to be mastered by students. Thus, the core curriculum is a general curriculum, or about general educational materials. The general education materials must be studied by all students, with the aim that they have the same basic knowledge and ability.

To give each student the possibility of developing their potential, the elective subjects are provided. So, the learning plan on this kind of curriculum always provides two packages, the core curriculum package and the elective package, which contains fields of study that can be selected according to the interests and talents of each student. The core curriculum materials can be drawn from the field of study. This can also be taken from the problems of daily life, in accordance with the interests of the expected personal developers of the students.

Relationship Between Curriculum and Teaching

The term curriculum may be viewed as indicating to a learning plan for students who attend education in a particular educational institution or school. This learning plan is a guide in carrying out teaching and learning processes.

When we look closely, the execution of teaching is geared to what is contained in the planning of teaching or learning plans. Thus, there is interrelationship between the curriculum and teaching. Without a good learning plan or curriculum, effective teaching implementation is almost impossible to achieve. Similarly, no matter how well the planned lesson or curriculum is developed, without any instruction in teaching, the compilation effort is less meaningful (Saylor, Alexander, and Lewis, 1981).

In addition, the curriculum is a learning plan containing various aspects that are related to the implementation of education in schools. Within the plan, it includes how appropriate teaching is to achieve the curriculum goals. Thus, teaching is an integral part of a curriculum (Akker, 2006).

In the context of sustainability education curriculum, its core activities are emphasized on the practice of teaching and learning of sustainable development. This is due to the fact that indicating the major function of education, in this case, is an essential tool for achieving sustainable development and highlighted areas of action for education.

Sustainability education involves integrating key sustainability issues into teaching and learning. This may include, for example, instruction about climate change, disaster risk reduction, biodiversity, and poverty reduction and sustainable consumption. It also requires participatory teaching and learning methods that motivate and empower learners to change their behaviors and to take action for sustainable development.

Problems that can arise in connection with the above concept is how to develop a curriculum for the benefit of teaching so that it can be implemented effectively. In the context of macro curriculum, particularly in standard-based curriculum, the curriculum implementation in schools should be the same. However, the implementation of the curriculum needs to consider many factors, such as availability of competent teachers, condusive learing environment, and supporting facilities. The curriculum cannot be implemented with maximum results without involving these factors.

Sustainability education carries the inherent idea of implementing programs that are locally relevant and culturally appropriate. All sustainability programs must take into consideration the local environmental, economic, and societal conditions. This should involve

and motivate individuals and organizations to reflect on how they currently live and work including their value systems that can bring changes in the way they do things, leading ultimately towards a more sustainable future. This seeks to develop the knowledge, skills, values, and attitudes necessary to bring about the change required for sustainability.

In order to help the students knowledgeably engage in sustainability, appropriate approaches need to be developed in terms of both the content of the learning and the style of the learning process. According to UNESCO (2005), the content needs to include futures thinking (visioning), participation in democratic processes, development of problem-solving skills, collaborative action, generation of collective knowledge through dialogue, consensus-building, critical and systemic thinking and an exploration of the change process. The process, on the other side, facilitates people with the skills necessary to be leaders and engagers in the change process towards sustainability. It applies engagement rather than informing. It also applies approaches of learner-centered, creating situations for participants to become involved in decision-making, being collaborative and participatory in designing and developing the program, offering opportunities for dialogue and generation of shared knowledge, seeking to be self-sustaining, and developing partnerships and networks.

In its implementation, it needs to do efforts on the curriculum implementation planning. In the planning of curriculum implementation, we need to think of what goals to be achieved, what materials or learning experiences are provided for the students in the attempt to achieve the goals, how the learning experiences are organized by using appropriate teaching methods, and how to assess the students' learning success in accordance with the goals. Based on this, then the ultimate goals of the plan to achieve educational results are determined based on the optimal macro curriculum. The embodiment of the outcome of this plan in practice is through teaching. Thus,

a non-teaching curriculum will not bring the educational results to the students. Whereas teaching without a curriculum can be an unfocused and unplanned activity.

To recapitulate, teaching and learning processes are the core activities in the implementation of the curriculum. In another word, it is the curriculum actualization so it is the actual or the real curriculum. From this perspective, the curriculum will remain as an ideal program which is potentially become a means to achieve the education goals and objectives if it is not actualized in the teaching and learning processes.

Chapter 4

Foundations of Curriculum Development

Education, from the global perspective, is aimed at achieving four goals, namely personal development, employability, citizenship, and cultural transmission and transformation. This means, national education in every country has a major mission of providing its youngsters with competencies, knowledge, skills, and attitudes needed by each of them for:

1. Realizing his or her potential capacity in his or her life.
2. Being employed for generating income.
3. Becoming a good citizen in the sense of knowledgeable of his or rights and obligations as a citizen.
4. Preserving, enhancing, and improving the local and national cultures.

The implementation of education is guided by a curriculum. In this context, the curriculum is a means or vehicle to achieve education goals. The government-developed curriculum which is used by schools is called the official curriculum. The substance of the curriculum is a written plan of learning. Ideas or beliefs underlying the curriculum would shape directly its components to be achieved through education.

This curriculum can also be called an ideal curriculum or the formal curriculum which reflects a desire or hope which will be realized when it can be implemented. Meanwhile, the implementation of the curriculum in the actual situation is called the unofficial curriculum or the actual curriculum. The unofficial curriculum or the actual curriculum describes the true state of the education itself.

The realization of the formal curriculum into the actual curriculum requires the efforts of the implementers or teachers to think about how to implement the curriculum so as to achieve the goal optimally. Such thoughts are included in the development of the school curriculum. This chapter describes the foundations used in curriculum development.

Urgency of Curriculum Development

It has been explained in advance that the formal curriculum is essentially an aspiration, or a wish to be realized through the provision of education. What is contained in the official curriculum is an idea. While the existence of an idea sometimes can be realized in reality. This depends on various factors that can support the successful embodiment of ideas contained in the official curriculum. The important point is the ability of curriculum implementer in developing and implementing the curriculum.

Teachers are responsible as the implementer of the curriculum in terms of the efforts to realize what is contained in the official curriculum This is based on the reasons below:

1. Teachers directly implement the curriculum in the classroom.
2. Teachers need to describe the official curriculum in operational form so it can be implemented in the teaching-learning processes through:
    a. the analysis of a more general purpose/objectives to more specific instructional objectives;

b. the development of a successful appraisal tool for achieving goals;

c. the formulation of instructional materials to suit the objective/ purpose;

d. the formulation of teaching and learning activities that can provide learning experiences for students; and

e. the implementation of all programs in an effort to implement the official curriculum.

3. Teachers are the ones who directly face the problems that arise in connection with the implementation of the curriculum.

4. Teachers also seek to solve the problems faced.

Professional Teacher and Curriculum Development

To day, educational personnel, especially teacher, is a profession, just like professions in medical doctor, pharmacy, and lawyer. The teachers' professionalism, however, needs collective efforts to be equalized with the other aforementioned professions It is because this profession demands various requirements. In fact, sometimes, there are teachers who are formally regarded as professional teachers but have lower abilities than the ones who are formally considered unprofessional. This suggests that the professionalism of teachers is a kind of formalilty.

If we explore more closely about the profession in various fields, a teacher as the profession is still far from being ideal. As an illustration, we take the medical profession as a comparison. In terms of the education level to be followed, the professional doctor may only be carried by a person who has completed his undergraduate education at the Medical Faculty (4 years), undertaking clinical practice and internship in the hospital as professional development partner (2 years), and has passed the medical doctor's competence examination. Thus, in performing the duties, a doctor is always

guided by related theoretical abilities in a field and is supported by adequate skills acquired during the clinical practice. This results in proper working procedures.

In treating the patient, for example, before determining the type of illness suffered by the patient, the doctor conducts a diagnosis (identifying the symptom and what causes it) carefully, followed by the ability to make prognosis (linking the cause with recognizable symptoms to determine the proper and effective treatment). Based on these things, then doctor gives treatment. With the support of his/her professional skills, the results of treatment can be done quite satisfactorily.

Unlike the case of the teacher profession, in terms of education level, one can become a teacher after graduating from university level in a related field for four years plus one year (two semesters) professional education which is quite different from the way a prospective medical doctor undertakes clinical practice and internship both in terms of duration and training activities.

Although the prospective teachers should come from the undergraduate program, the fields they undertake are not necessarily in education. Those who earn an undergraduate degree are eligible for being admitted to the teacher professional education. This can have an impact on the reliability of teachers in performing their professional duties, especially when compared to doctors.

In terms of working procedures and results, when the input of education is equalized to a patient, while educational practice is equalized to the procedures and work techniques of a doctor, educational process should be able to deliver students to achieve educational goals. The reality often indicates that the professional expertise of the teacher may not necessarily guarantee to facilitate every student or the majority of students to achieve the desired curricular goals when compared to patients who seek medical attention can most likely achieve the patient's expected goals.

We admit that many factors influence the success of student learning. In terms of teaching and learning processes, for example, a method that is considered appropriate for a group of individual students is not necessarily suitable for other groups. Similarly, a method employed by some teachers may be effective, but in the hands of the other teacher becomes ineffective. There are many other factors that show how difficult a teacher's work is.

However, this does not mean that teacher professionalism is impossible to achieve. The above illustration and comparison is a challenge faced in realizing this idea of teacher professionalism. One thing that should be noted here is that it is needed a clear benchmark of professional teachers in an effort to realize the professionalism of the teacher. In addition, the requirements to become a teacher also needs to be formulated with reference to the benchmark. For this purpose, the following section will explain the definitions of the profession as the basis for reviewing the concept of professional teachers.

The Meaning of Profession

Generally, a work can be done and completed well in the hands of someone who has the ability and expertise in that field. This ability at the most basic level and simple is characterized by the existence of work skills. With work skills, a person can complete his or her work related to the given job better.

The work skills that one possesses are derived from the exercise, which is a kind of activity that is done repeatedly using certain procedures and techniques. In such a way, the procedure and technique used is a coordinated one. However, it cannot be said as the only clue that a person has a work skill. We need to prove that someone has the work skills, the mastery of working techniques requires the related knowledge, even though in a limited degree, or at least is a technical knowledge.

Work skills are a requirement of a profession. However, not everyone who has job skills in a field is viewed as a professional. The level of work skills exists at the level of technical skills alone, and some are at the expert level, which is supported by related concepts and theories. With the support of theory, it allows people to predict and control a phenomenon described in that theory. The last described skill is often associated with professionals.

To master a professional skill, high-level education and training are required. Usually, if this is linked to the educational level, it is commonly associated with the university level. However, this is not the only way to master a skill or profession because someone can be a professional by studying and training himself in a particular field, even though he does not go to college.

The difference between these two ways of achieving professional recognition lies on the basis of education. Someone who aquires the profession on the basis of education will gain formal recognition, while the one who obtains it from other than formal education is generally only recognized informally.

In addition to those views, we can also review the profession in terms of procedures and techniques for carrying out the work. A professional in a field will carry out the work which is based on clear concepts and theories. With this foundation, it allows him or her to always control the possibilities that arise from the work of reason. Therefore, professionals in carrying out their duties in a filed are always logically reasonable and acceptable

In addition, a professional position is characterized by the nature of the impact of its work on the community. That is, the impact that arises from the work he does is always responded by the field of the profession. Thus, the field of the profession must be developed in line with the dynamics of the development of community life.

In summary, it can be stated here, that a job or professional position has the following benchmarks:

1. The existence of work skills based on the concepts and theories of the related discipline;
2. The focus on a skill in the field related to the profession concerned.
3. The formal requirement of a high degree of completion of education
4. The sensitivity to the social impact of the work undertaken
5. The possibility of development along with the dynamics of the development demands in life.

Based on the benchmark, the following discussion will review the position of job or position of teacher in the context of professionalism.

Main Demands of Professional Teachers

Professional positions in a field can be examined from the point of the benchmarks mentioned above. It also requires a certain competence. In this context, competence can be seen from the following indicators.

1. Competence is supported by background knowledge.
2. Competence can be identified from the performance in doing the job in accordance with the demands.
3. Competence entails clear procedures and techniques.
4. Competence can be seen from recognizable work.

Based on this description, the term competence refers to the combination of skills or special skills, and it is linked to the implementation of field work. Competency study is very important for the development of educational activities related to a type of work because it is a hallmark of the job title or in the field. By recognizing these characteristics, the task of the job in a particular position can be analyzed for further formulation in education.

It has been discussed before that a profession demands expertise. So, the teaching profession entails a position in the field

of teacher training that requires expertise. If this is linked to the tasks of teachers in the field, it is necessary to recognize in advance whether or not the competencies are required by the teacher. Based on this concept, the main demand of teacher as the profession is competence associated with the position.

Asian Institute for Teacher Education (1972), formulate the details of a teacher's competence as follows:

1. Personal competence covers the following traits
   1.1. knowledge of customs (social and religious);
   1.2. knowledge of tradition and culture;
   1.3. knowledge of the core of democracy;
   1.4. knowledge of aesthetics;
   1.5. appreciation and social awareness;
   1.6. the right attitude to knowledge and work;
   1.7. faithful to human dignity.
2. Subject competence, which has adequate knowledge about the subjects.
3. Professional competence includes the ability to which the teachers:
   3.1. understand and apply the foundation of education, whether philosophical, psychological, or other foundations;
   3.2. understand and apply the theory of learning according to the level of development of children's behavior;
   3.3. are able to handle the subjects assigned to him/her;
   3.4. understand and be able to apply appropriate teaching methods;
   3.5. can use various learning tools and other learning facilities;
   3.6. can organize and implement teaching programs;
   3.7. are able to conduct educational evaluation;
   3.8. can grow a child's personality.

When examined carefully, from the three competencies as mentioned above can be concluded that the first two kinds of competencies are a prerequisite for the third competence. That is why teachers can display professional skills when they have personal competence and subject competence. Therefore, the professional manifestation of the teacher can be demonstrated by his performance in demonstrating the professional competence.

In Indonesia, teacher competence refers to four main competencies: professional competence, pedagogical competence, personal competence, and social competence (Ministry of Education and Culture, 2004). These four competencies are the foundation for developing an educational system and education personnel and they can also be attributed as a requirement for someone who wants to become a teacher.

It has been explained that the meaning of the curriculum refers to the learning plan. The plan includes the components of objectives, materials, methods, and evaluation. To realize the plan in practice, the official curriculum that becomes the reference in the delivery of education needs to be developed by teachers.

A professional teacher always bases his work on rational theories and concepts. If we explore more closely the professional competence of teachers and then compared with what should be done in curriculum developers, it can be concluded that:

1. In implementing the curriculum, the teacher requires a theoretical foundation, especially related to the theories of learning and individual development.
2. In developing the curricular content, it is necessary to organize the rational order of material with reference to the nature of the subject/dicipline.
3. In implementing the teaching and learning processes, teachers need the ability to handle lessons by using tools, methods, and learning facilities.

4. In assessing the teaching and learning processes, the teachers need the ability to evaluate learning outcomes.
5. At the macro level, curriculum preparation is directed to foster learners in accordance with the planned educational goals and objectives.

The ability to perform the activities as mentioned above must be supported by personal ability and mastery of subject that he/she is teaching. The ability is also required in performing curriculum development. Therefore, the ability to develop curriculum become a professional demand for the teachers. At the school level, curriculum development deals with the planning of curriculum implementation so that every developer needs to understand the concepts of various disciplines.

Conceptual Base of Curriculum Development

Basically, curriculum is a plan for teaching. In designing this plan, the ideas of the designers affect the curriculum itself. In several countries, the formal curriculum is designed nationally., However, at school level, curriculum is developed by teachers by considering the students' potentials and the school's condition.

The curriculum at school level is called a micro curriculum and its development applies a planning model. This is based on the conceptual framework of micro curriculum design. In general, the concepts related to curriculum development can be traced from the development process itself. With this concept, at the beginning, the curriculum is the designer's idea of the school education activity (Stenhouse, 1976).

The idea in mind is communicated by putting it into a written plan that will be used in the practice of school education. That is why educational practice often results in students' learning experience which is not written in the planning. This kind of learning result

is called the hidden curriculum (Taba, 1962, 1972). In general, this can be illustrated in the following model.

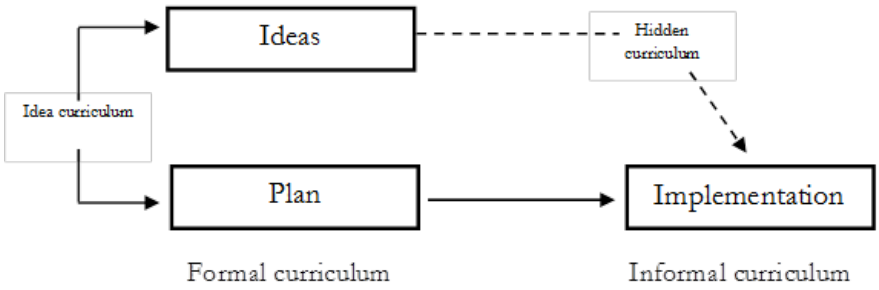

Figure 4.1: Curriculum design model

The picture shows that the process of curriculum development starts with the process of thinking about various matters relating to the implementation of school education (ideas) that exist in the mind of the curriculum developer. The idea can be based either on thought, the research or combination of the two. In addition to the results of research and thought, development of micro curriculum also rests on the official curriculum which is issued by the government. All of these serve as the bases for developing a written plan or an operational curriculum.

In the context of the macro curriculum, this official curriculum is a curriculum book that is used by all schools in a territory. In the context of the micro curriculum, the intended curriculum is the school curriculum, the curriculum of the study area which is planned by the school. Based on the official curriculum, the education process is implemented (curriculum implementation). The process of education in schools that is reflected curriculum implementation is called the unofficial curriculum.

The existence of an ideal curriculum resides in the designer's idea and embodied in a written plan. We can only recognize the existence of this ideal curriculum contained in the plan, but essentially, the

wishes or expectations implied behind the plan may be more than what is written in the plan. This implies that curriculum developers must be clearer in putting their ideas in the forms of straightforward concepts.

In addition, in the implementation of the curriculum, there is often a result of learning which is not actually contained in the written plan. The results can give both positive and negative impacts on learning. This kind of learning result is called a hidden curriculum. The implication of the concept of the hidden curriculum is that in thinking of curriculum engineering, whether it is macro, or micro, the curriculum planner or engineer needs to anticipate the possibility of the emergence of a hidden curriculum that can minimize the possibility of a negative curriculum (Taba 1972).

In the context of the micro curriculum, the development process can be developed in the following chart.

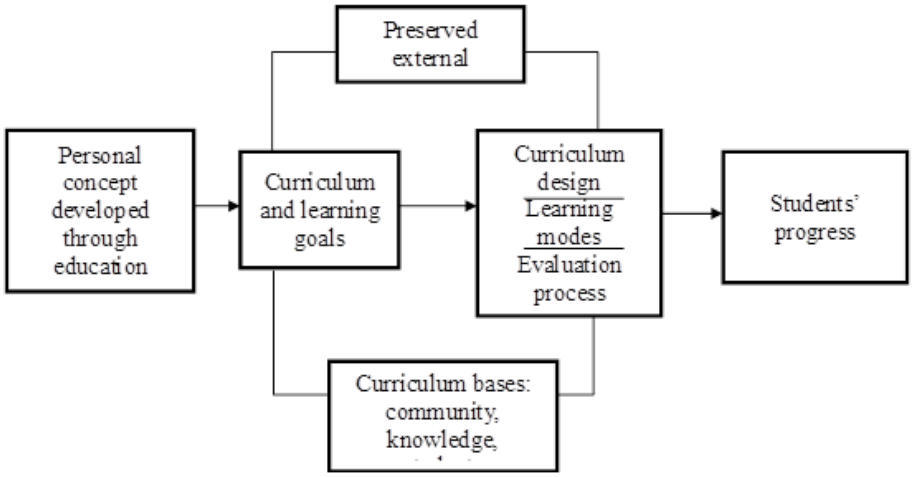

Figure 4.2: Curriculum design chart
(Adapted from Saylor, Alexander, and Lewis)

The above chart gives an explanation of the curriculum development process. The process starts with thinking about the personal concept or belief that wants to be infused in education.

Questions that can be used as guidance in thinking about this are "Which people have the personal traits to be established through the implementation of education?" Such questions are a philosophical reference for formulating educational goals and curriculum goals, while at the macro level, it is formulated as the goal of teaching. The objectives formulated with reference to the philosophy is used as guidance, then they will be used as guides in formulating forms of learning opportunities prepared in the curriculum.

By adjusting the thinking to the conditions and the order of the schools concerned, the formulation of curriculum objectives and teaching objectives is further formulated. The formulation of those objectives takes into account external forces, including requirements stipulated by applicable laws and regulations, the results of research, and professional knowledge in the relevant disciplines. In addition, these objectives are formulated on the basis of community, knowledge, and student needs.

The purpose of the formulated objective leads to the selection and determination of the curriculum design and the best teaching forms to be implemented, and the process for evaluating the curriculum. Both the curriculum design, the teaching process and its evaluation can be used to predict the expected progress of the students in the school education.

It should be a record for curriculum makers that basically any form of curriculum that we produce, conceptually, has advantages and disadvantages. So, curriculum development is a matter of choice or some kind of hypothesis. This hypothesis will be tested in practice, i.e. in the curriculum implementation. Whether the result is true to answer the challenge or meet the needs of the community, will be visible after the curriculum is implemented.

By considering the essential aspects of curriculum in the process of curriculum development by the developer, it is hoped that a produced micro curriculum will be more appropriate for the

school to be implemented. The concepts of curriculum development are expected to guide in the direction that produces a curriculum which is expected to be closer to the realization of community needs.

Foundations of Curriculum Development

Curriculum development is carried out by using benchmarks and foundations that are oriented towards educational outcomes through the use of the curriculum. The selection of the curriculum foundations can be carried out using the following benchmarks:

1. The curriculum is directed to produce something that is believed to be truth or goodness for society.
2. Learning experiences which are expected to be obtained by the students through the education is adjusted to the demands and needs of society.
3. Materials as the curriculum contents should be adapted to developments in science and technology.
4. Teaching and learning processes should be guided by the existing psychological theories, both learning psychology and developmental psychology.

Based on these benchmarks, curriculum development deals with deliberation and selection of the foundations, such as the philosophy adopted by the society, the community needs, science and techology develoment, and psychology.

Philosophical Foundation

What is believed by one person or society as a truth is an important thing to be used as a reference in the process of education because among the important aims of education is to infuse the values of truth. To be able to infuse values to students effectively,

each teacher should hold a value system which is relevant to what has been taught.

One study in philosophy is related to the value system. This system is one's view of something related to the meaning of life. This view is derived from one's study of the religious and social norms he or she embraces. Differences in views can lead to differences in the direction of education provided to students.

The individual's view of life as a value system is also shared by a group of people or nation. Therefore, the rules and social norms, as well as the value system, adopted nationally refers to the system. Thus, the organization of education is officially directed to form the people who have this particular viewpoint.

The value system, as one of the referenced values of the nation, needs also to recognize other values held by various groups of people with different religions, ethnicities, and customs. Every religion has different norms and value systems. Similarly, ethnic groups have various customs as highly respected values. This difference can affect the value system held so that what is believed to be a truth by individuals or society can be based on religion or other customs.

These differences are constitutionally guaranteed by law and regulation and one of the nation's philosophy which recognizes equality and difference. On this basis, the direction of education, in terms of infusing the values to students could be varied according to social background or religion respectively. So, it is not surprising that there are differences in direction of education.

Besides the value system, the individual concept of education itself has an effect on the direction of education. As explained in the last chapter, the concept of education in schools can be grouped into three types:

1. Education in schools serves to preserve and convey the cultural heritage to students.

2. Education in schools serves to transform culture.
3. Education in schools fuctions to develop the individual person (Taba, 1962)

In the first concept, the school functions to maintain and convey cultural heritage. In this context, the education in schools is directed to transfer and maintain cultural values held by the ancestors or the predecessors to students. The practice of implementing an education that adheres to this concept is that students are educated in order to preserve the cultural values of the previous generation. In another word, education functions to transfer values from one generation to others.

Unlike the case of the first concept, the second concept of education is directed in order that students are able to accept the values that come from outside that is considered as appropriate and good. Education functions to transform culture by adjusting and adopting other cultures that can enrich the existing culture. In the third concept, the direction of education is to emphasize the importance of fostering the potentials possessed by individuals. In this case, education functions to help students develop their potentials.

In practice, the philosophical basis of education must clearer so that teachers or curriculum developers can formulate this foundation into the process of selection and organization of curriculum components or elements. For teachers, clarity of curriculum foundation can lead them to plan and excute teaching and learning processes in the classroom. For example, teachers' beliefs about the truth could guide them in carrying out their duties more meaningful for students. Even more than this, every effort made by teachers can lead to clearer targets or objectives.

Community Foundation

It has been discussed before that education plays an important role in the process of infusing culture, socialization, and even in

social reconstruction. However, we often find it difficult to determine the goals of education, whether for preserving culture, socialization process, or social reconstruction. This could influence the role played by the educators in the teaching and learning processes. The emergence of the difficulties does exist because it is not easy to assess the dynamic changes in societal demand. Besides the dynamic nature and the growing demands of society, each community group has different demands and needs. For example, an agrarian society has different needs and demands from non-agrarian society. Similarly, people with high and good level of education will be different from those who have a poor and low level of education.

The existence of dynamic nature, the development of demands, and the peculiarities of societal life are influenced by various factors, such as the culture, and natural environment. This implies that differences and varieties among a group of people, especially from the aspects of life should be addressed by education. Therefore, in order for education to give a meaningful basis for the community, the curriculum planning needs to accomodate the demands and needs of the community as one of the foundations in its preparation.

Science Foundation

Science and technology are products of culture. Nowadays, the human culture associated with science and technology has reached a very high level. Advancement of science and technology grows rapidly and has reached the level of 'explosion'. It is impossible for students to cope with this rapid changes of scence and techology in a limited time allotment in school. It is, therefore, necessary to make an in-depth selection of the materials or curricular contents given to the students at the school. The school curriculum can only provide students with the most fundamental knowledge needed for their future life. In addition, the limitations that human has to acquire and controll all forms of science has led to the selection of curricular contents that are needed by students.

The school curriculum in some countries is national version. The implementation of such a curriculum does not require too much effort of teachers to select the types of knowledge which should be incorporated into the curriculum. However, in the course of carrying out their tasks, it is a must for them to formulate national official curriculum into an operational one. This can be done by conducting studies on certain forms of learning experiences that are appropriate for students. This is particularly true in the implementation of the curriculum at Senior High Schools.

In a curriculum, the lesson material (or content) is organized into two parts namely the core curriculum as a general education program, and elective program. The contents of the curriculum are selected and organized by a team. In this process, teachers should consder many factors in in designing a package of options that will be offered in the school curricula, such as students and school potentials. For example, if a senior high school has access to ICT facilities it is worth to be offered a package computer related-skills in the curriculum.

Psychological Foundation

Psychology deals with the study of human behavior. With regard to curriculum formulation, human behavior is the basis for 'learning'. This includes theories of the learning process itself, and theories of individual development associated with the development of learning.

Learning Theory and Curriculum Development

Learning theories serve as one of the foundations of curriculum development in addition to other foundations that have been described above. The study of the learning process that forms the core of learning theories derives from the branch of psychology.

The learning theories are highly diverse. Every theory explains certain aspects of learning that can shape ways of the curriculum is structured or developed. In practice, a theory of learning might not be applicable in many situations. There is a suitable situation for a particular learning theory to be applied, and some are unsuitable. Therefore, the preparation and development of the curriculum should deal with the understanding of the various theories that must be selected as one of the curriculum foundations..

Each learning theory is formulated based on a study of individual behavior in the learning process. The review essentially concerns with:

1. Concepts dealing with the human mind which consists of a number of potential abilities, such as reasoning, remembering, and imagining that can be trained.
2. The concept that human beings are an energy system, a dynamic power system, which seeks to maintain balance in response to other systems of energy so that it can interact with the whole human body including taste organ. This energy system includes responses to stimuli, drives and reasoning processes.

The study of these two concepts produces learning theories that can be grouped into two kinds of mainstreams, that is,

1. Cognitive psychology, which views that the human mentality or cognition consists of a number of diverse powers. In this case, learning in principle is to train the mental powers. Learaning in this connection is shaped by cognitive processes. The concepts of cognitive processes are two kinds of models, namely 1) models that show cognitive processes in the acquisition of understanding through perception and gestalt, and 2) information processing model that takes place within the individual
2. Behaviorism or Behavioristic psychology that assumes that human behavior is essentially a collection of responses to stimuli.

There are two variants of this theory. The first is known as connectionism that assumes that the behavior is a response to certain stimuli coming from outside. Each stimulus has a relationship or association/connection with a particular response form. The second, behaviorism theorizes that processes within the organism should be acknowledged, particularly the presence of private events (such as thoughts and feelings), and suggests that environmental variables also control these internal events just as they control observable behaviors.

This perspective emphasizes the formation of certain mental power. This school of thought affects the preparation and development of the curriculum in terms of the selection and organization of the lesson or learning materials into the contents of the curriculum. This school of thought does not question the form of content included in the curriculum.

The cognitive psychology puts more emphasis on the function of materials (curricular content) in shaping a certain mental power. For example, Mathematics serves to form and develop good thinking as the main focus of learning. Similarly, writing or painting serves to form the mental power of fantasy and memorization to form the mental power of remembering. If schools want their students to have high abilities in both cases, these lessons become the main emphasis in the curriculum.

The problem that may be encountered in applying learning theory according to this psychology of learning is to determine what type of study that coud be best trained, shaped, or developed by using the brain. Experts have assumed that lessons are hardly considered to be very useful in this regard. Therefore, mathematics lessons are deemed good and most importantly taught in school. Because this lesson trainsstudents to solve difficult math problems, then the ability of the brain will develop.

The most prominent learning process in the application of this theory is through practice and practice, such as in solving problems, memorizing, and composing. Student learning motivation according to this theory should be very important to consider, as well as in the implementation of teaching. Whereas, the factor of individual differences is considered irrelevant for the application of this theory.

The problem of transfer in learning is advocated by this theory as something automatic. This means that when the mental power has been trained and formed, this ability can be transferred to other situations. So, people who already have good thinking ability, trained through math, for example, the ability can be diverted in solving complicated problems of life, such as social, economic and political problems.

In contrast to the adherents of the mental discipline perspectives, the behavioral psychology views that human behavior is a response to stimulus or stimuli. As it is explained above, there are two main branches or variants of the theory due to differences in the concept of response, i.e. the theory of connectionism and association of cognitive theory.

According to association theory, each stimulus has a relationship (association, connection) with a particular response. Learning, in this case, is formed by a number of stimulus-response ties to the individual self. To form the association, it is necessary to exercise mechanically, such as by way of repetion.

Because this theory views the transfer of learning is limited, i.e. transfer into situations that have similar elements, the lesson materials that are structured in the curriculum should be as much as possible similar to life situations. Thus, learning outcomes are expected to be useful for students, as they can be transferred into life situations.

The curriculum which is based on this theory contains lesson materials that are broken down into small units. Each unit is

structured and formed into an exercise for the formation of bonds between stimuli and related responses. The learning process can be done mechanically, even it can also be done by using learning packages, such as programmed teaching, or teaching by technology tools, like teaching with computers.

Connectionism theory assumes that certain behaviors can be formed through conditioning. There are two types of conditioning theories, namely classical conditioning pioneered by I. P. Pavlov, and instrumental conditioning theory pioneered by B. F. Skinner. Classical conditioning emphasizes the importance of exercise factors to elicit other responses from a particular stimulus. This theory assumes that repetitive practice of data results in a form of behavior, in response to a stimulus, although the stimulus is only in ordinary circumstances.

Classical conditioning theory is very appropriate applied in the process of learning things related to the habit, such as morals, courtesy or language. For example, habituation or continuous practice in language learning will result in certain habits in using the target language, even if one does not use the language.

Meanwhile, in instrumental conditioning theory, the role of reward factor becomes prominent. This reward can be a reinforcement to the bond of stimulation and response. There are two kinds of rewards, those that come from outside like praise, and those coming from inside like feeling satisfied with the response to a stimulus. Because the reward that comes from within the self is a stimulus binding that can trigger response and this process is not dependent on outside factors.

The application of this theory in the preparation of the curriculum is reflected in the selection of teaching materials, and learning processes as described above which is also highlighted by the forms of reinforcement. This can be applied through a continuous assessment system, and the results of the assessment are notified to the students. Thus, students who succeed in the assessment

can gain reinforcement. This is one of the characteristics of the curriculum that emphasizes the learning process through the tools as described above.

Another theory that became the main branch of behavioral psychology is a cognitive theory. This theory differs from association theory in explaining the concept of response to stimuli. In associationist theory, the concept of response is more accentuating observable behavior, whereas, in cognitive theory, the emphais is on the process of cognition, which is the primary function of intellect or intelligence.

The theory of the cognition process which is reflected in the acquisition of understanding or insight is known as gestalt theory. This is also known as information processing theory.

The gestalt theory views that acquisition of understanding is characteristic of the human response in perceiving or responding to the environment. This understanding comes suddenly when one can see relationships between elements in problematic situations, or when one can understand the core of the structure in problematic situations. In another word, the theory implies understanding is a kind of sudden reorganization of experiences, such as when one finds a new idea or solves a problem.

In gaining insight, individuals learn by experience, by a trial and error for acquiring a plan, The acquired experience can be reorganized when faced with the same situation. For example, in learning mathematics, not only done by studying the answer to the problem, but also by obtaining a solution to the problem. Therefore, the understanding of the existence of the problems and knowing how to solve them is essential. The curriculum structure which is based on this theory is more associated with the practice of analytic thinking through problem solving. Lesson materials are structured along with the importance of the structure of a discipline, i.e. ideas, concepts, and theories derived from a certain science. Learning occures with process approach. Thus, students can master how to solve problems

or problems related to the theory. With this mastery, their ability can be transferred into various situations related to the theory.

Information processing theory emphasizes the study of a person's process of receiving, storing and retrieving the information obtained. This theory is more emphasized on the memory and process of cognition. According to this theory, stimuli in the form of information obtained by individuals from the environment sent through recipients to memory or short-term memory. The information received is sent back to the nerves by short-term memory. However, in addition to the stimulus in the form of instantly responded information, it is also stored in the memory storage warehouse in the brain, which can be re-issued (or recalled) in response to the same stimulus.

The application of this theory in the learning process in school is that learning is essentially an effort to obtain and store information so that at any time can be used when necessary. This information storage is called remembering, and the process is done through the process of cognition. In the cognitive processes, the role of learning conditions is very important.

Learning conditions are a prerequisite for the process of studying certain types of materials. Conditions that can be arose from within, like a motivation, and some come from the outside, such as teaching and learning situations created by teachers. In creating this situation it is necessary to identify the desired forms of learning outcomes. Alignment of learning outcomes with learning conditions will improve the effectiveness of the learning process.

The curriculum, based on this theory, emphasizes the importance of selecting instructional materials whose information can be stored in long-term memory by students. Such materials can be selected from the subject areas. The materials that should be chosen are the basic ideas, or what Bruner (1966) termed 'structures'. The suggested form of the curriculum is the spiral one. This type of curriculum

presents the same materials in various levels of education repeatedly with different levels of depth and breadth of learning according to the level of education.

From the point of the learning process, this theory also takes into account the information processing theory, emphasizing how the materials can be stored in the long term memory. The appropriate ways to realize this type of learning is by using the inquiry and discovery method (Bruner, 1966), or by using Ausubel's model, which is known as the advanced organizer (Joice and Weil, 1986).

Based on the aforementioned discussion, it turns out that the preparation and development of curriculum need to be based on the theories of learning because the theories can provide an explanation of the learning processes in various situations. By knowing the learning processes, the developed curriculum can give students the possibility to learn effectively and efficiently.

Individuals in the learning process

Since learning process essentially takes place on an individual basis so in selecting learning experiences we need to consider individual variation or individual differences. We can observe these symptoms from recognizable events. For example, a teacher teaches a number of students in a class with the same materials and at the same time including the same method and tools, however, when their learning outcomes are assessed, the results differ from each other. The concept of individual differences in learning is in harmony with the general concept of psychology which sees that each individual is a unique person. According to this concept, each individual has both psychic and psychic characteristics that distinguish one from the others. In line with influential psychic traits in learning, individual uniqueness is characterized by differences in (1) potential ability, (2) Readiness in learing, and (3) motivation to learn

Potential ability

Potential abilities include talent and intelligence. Talent is the mental ability possessed by a person who can develop when conditions permit. There are various views about what is meant by mental ability depending upon the following.

1. Factors that triger the existence of mental ability, for example, talent could be influenced by heredity or environmental.
2. The nature of talent, wheter it is considered as constant or changeable.
3. The concept of talent itselft, whether it is perceived as unity or a number of special abilities.

Different views on the above issues lead experts to conduct research on talent. Various studies have led to the conclusion that talent is the result of the interaction between innate and environmental factors. Therefore, talent is not constant, it can be changed. But the extent to which the changes that occur in a person cannot be ascertained. For example, a person has a talent in a particular field, then if it is trigered by circumstances, and conditions that likely develop that talent, his or her ability will change even higher. Conversely, if the situation does not support, it can also decrease the ability level.

Apart from that, talent is seen as not in unitary form. Talent has a variety of parts on the person. For example, there are individuals who have high mechanical talents but low in verbal terms.

John B. Carrol sees the inner talents generally equal to intelligence. Talent in is not an index that describes ability level of a person to learn something but rather describes the speed of time in learning (Carrol, 1963). So, talent shows how long a person can master what he or she learns in the given ideal condition for learning. This means that people with good talent will learn better in ideal learning conditions. Meanwhile, those who have poor talent will take longer.

This concept has implications in the preparation and development of curricula relating to the importance of considering individual differences in learning abilities. The curriculum should provide a learning task that allows each student to master the material according to their respective abilities. In this connection, it is appropriate if the curriculum is structured in the form of individual learning packages. Thus, each student can achieve learning progress in accordance with their respective potential.

Intelligence and readiness

An individual's intelligence evolves chonologically. A newborn baby or 5-year-old child, for example, has not been able to do the thinking process. Yet, once he reaches that age, he can do something he previously could not afford. This shows that the intelligence develops in a chronological way.

Jean Piaget, a Switzerland psychologist, is the figure who put forward the theory of intellectual development. Based on the results of his research for many years, Piaget formulated the stages of development of human intelligence as follows:

1. Sensorimotor Period. At this stage, the development of intelligence is still in the form of coordination of the actions which is also reflected in language development. This stage lasts approximately at the age of 0 to 1 half year.
2. Pre-operational period. At this stage, the individual is able to recognize a variety of objects but has not been able to classify the object which is based on a certain concept. Nor has it been able to draft, or see relationships between objects. This stage lasts approximately at the age of 1 and a half until the age of 6 years.
3. Concrete operational period. At this stage, the individual begins to form the classification of various objects based on a particular concept and can also see the relationship between the various

objects. But its ability is limited to concrete or imaginable concrete objects. This takes place at the age of 6 or 7 years until the age of 10 or 11 years.

4. Formal operational period. At this stage, the individual is able to use abstract thinking symbols and abstract relationships between various objects. It begins at the age of 10 or 11 years on wards.

The stages of intelligence as stated above, based on the situation that took place in general. It does not reject the degree of intelligence So, it turns out that individuals who have a high degree of intelligence, their ability can be achieved at a lower age than what generally applies. On the contrary, lower achiever individuals will run the stage slower.

As a foundation for curriculum development, intelligence stages can guide us in selecting and organizing appropriate materials and learning processes for our students at a certain age.

Readiness in learning has a close relationship with the development of intelligence. Readiness itself can be defined as the capacity to perform an action. Readiness has a relationship with the development of intelligence. Someone who has reached the stage of development of a particular intelligence is considered having preparedness to learn the materials in accordance with that age. For example, a person who has entered formal operational stage is considered ready to study abstract subjects.

Regarding preparedness, the traditional view assumes that certain subjects are new to the child at a certain age. For example, algebra or geometry lessons are considered newly studied by Junior High School students. In this connection, Bruner (1960) states that any material can be given to anyone at any age by presenting them appropriate with the level.

Based on this concept, curriculum preparation can use a spiral approach, as it is mentioned earlier. A similar material can be given

at different levels of the class or school with the depth, breadth, and manner of presentation completed with the stage of intelligence that the child has achieved.

Learning motivation

Someone will want to do a job no matter how heavy it is if he or she has high motivation. Similarly, in learning, motivation plays an essential role to achieve results. Motivation is an encouragement to behave that arises from the inside or the outside of students.

A student who does a hands-on experience in sustainability education lesson can find it completely new to him. Such discovery may be encouraging to know further. Under the guidance of a skilled teacher, he will be given various instructions for other learning activities. For that reason, he does everything that could allow him to succeed. This can be done because he has the motivation to do that.

The description above is just an example of how to generate motivation in learning. There are many other examples that can be given, such as growing the desire to get high repetition, is also one way of generating motivation.

Motivation is a psychological factor which drives an individual behavior. Theoretically, fulfilling a basic need, such as biological, psychological, social, esteem, and self-actualization needs drive an individual behavior. The basic needs are hierarchical in their nature. Once an individual satisfies his or her lower needs level he or she will behave to fulfill his or her higher level one, and then move again until fulfilling the highest level in the hierarchy of the needs. This is applied in every aspect of human life, including motivation to learn.

Motivation is derived from an individual's desire to fulfill their basic needs whether it is physical, psychologcal, or social needs. Latham and Pinder (2005) define motivation as a set of energy that can drive an individual to achieve certain goals in life. Similar

to them, Santrock (2011) also defines motivation as a process that provides an individual with spirit, directs and sustains individual's behavior.

Motvation is often divided into intrinsic and extrinsic motivation. Intrinsic motivation is an internal motivation even though an individual does not have an external reward for doing something, while extrinsic one is a type of motivation that is driven by rewards and punishment that an individual will receive. Implementation of this concept in sustainability education curriculum development is in the selection of learning and teaching activities should consider those that can generate the students' motivation, particularly the intrinsic one, so that they can learn better.

Chapter 5

Procedures of Curriculum Development

In order to make an effective sustainability education curriculum which serves as a vehicle for achieving its goals, the curriculum should be developed by following certain procedures. The procedures should ideally meet the design which describes the curriculum components and their interconnection, the system for analyzing each component and interconnection among them, and the steps in its development. In this chapter, however, one needs to understand the framework of a sustainability education prior to understanding the procedures of the curriculum development.

Sustainability Education Curriculum Framework

Curriculum framework can be defined as a group of related subjects or themes which fit together acoording to a predertermined criterion (Marsh, 2009). In the context of sustainability education, curriculum framework refers to interconnected-subjects or themes related to the sustainability education that provides a rationale or the bases for developing curriculum components of sustainability education.

The curriculum framework is targeted at curriculum designers, planners and senior executives at different levels of the educational system, and also schools and their partners. Its practical implementation must be supported by various aspects. Teachers and students need

new models, textbooks and learning materials. In order to produce them, the close cooperation between subject didactics, teaching practice, and textbook writers is needed.

The things need to be considered in the sustainability curriculum are: First, it should be implemented in cross-curricular topics through thematic areas of specific school subjects or the integration of subjects.

Second, the curriculum implementation, in the form of teaching and learning processes, applies the competency- based approach and addresses student-oriented approaches.

Third, a particularly important contribution to educational transformation is a common agreement on values and objectives. Such an agreement can be seen in the global community's resolution on sustainable development goals (SDGs) and in the UNESCO impulses for the implementation of the Agenda 2030 in education.

Fourth, in an increasingly globalized world, the principle of sustainability has become the central values of a vulnerable and extremely endangered environment and humanity.

The elements which should interconnect to one another are:

1. Goals and objectives must be based upon comprehensive sustainable development principle.
2. The curriculum content in regard to achieving the objectives and goals must be selected and organized by taking into consideration the four foundations that are explained above.
3. The curriculum processes or the teaching and learning processes emphasize on the hands-on experience.
4. Evaluation uses proper model which is focused on the comprehensive aspects of the curriculum and applies proper evaluation technique.

The Curriculum Framework must connect different educational traditions, like Environmental Education and Global Learning to within sustainability education. In the desired transformation process, the

comprehensive sustainable development principle will be the value center and common starting point for all school subjects and school activities as shown in Figure 5.1.

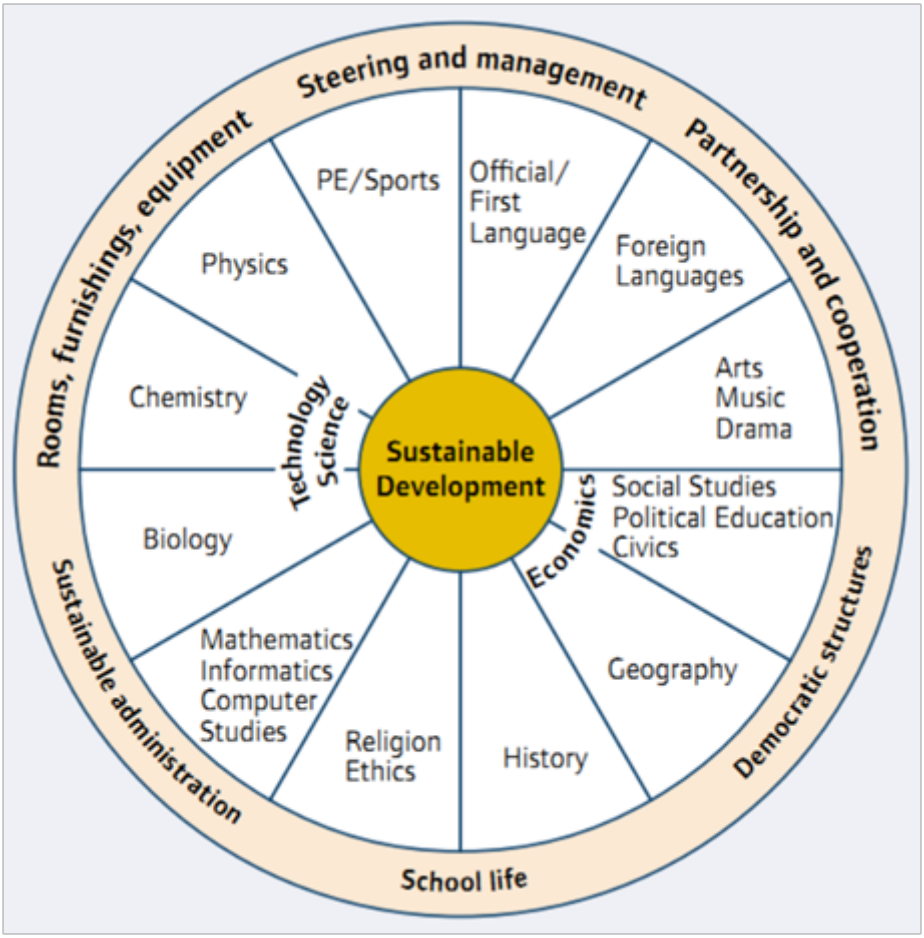

Figure 5.1: Sustainability education curriculum framework (Schreiber and Siege, 2016).

The framework as it is shown in Figure 5.1 explains that the sustainability or sustainable development may be integrated into every subject of the curriculum, both related to technology and science and economics. Its scope includes school life, democratic structure, partnership and cooperation, steering and management, room, furnishing, and equipment; and sustainable administration.

According to the Curriculum Framework, learning processes at schools are not only based on common values, but they also share common objectives aimed at developing basic competencies for shaping one's personal and professional life, active involvement in the transformation of society, and for accepting shared responsibility on a global level.

Moreover, educational topics need to be related to students' real life. If the chosen topics are not connected to their life and surroundings, learning would not be meaningful for them. Appropriate didactical and organizational forms of cross-curricular and subject-linking learning need to be developed and enhanced. Even where the chance is limited to implement these forms, the principle of sustainable development will be the foundation of all subjects and supplementary educational activities as well as of school management within a whole school approach (Schreiber and Siege, 2016).

It is important to be considered, that by 2030, all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through sustainability education, sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity.

The Rio Earth Summit in 1992 was the starting point for the international acceptance of the guiding principle of sustainable development and for the necessity to attune social, economic and ecological objectives. Education is a right that transforms lives when it is accessible to all, relevant and underpinned by coreshared values. High quality in education is the most influential force for alleviating poverty, improving health and livelihoods, increasing prosperity and shaping more inclusive, sustainable and peaceful societies. So, it is in everyone's interest to ensure that education is at the center of the post-2015 development agenda.

Schreiber and Siege (2016), reiterate that the end of the four mutually reinforcing waves of global change mentioned below creates a new reality of the international system:

1. Networked global economy. The accelerating economic globalization which creates manifold chances but at the same time global vulnerabilities and risks.
2. Diffuse power structures. The tectonic shifts of power towards the emerging countries, most of all China, India, Brazil, which undermine the Western dominance and create polycentric power constellations and blockages.
3. Anthropocene - the geological epoch of mankind. The realization that mankind has become the driving force in the earth system, and that it is likely that within this century there will be a change in the earth system with incalculable effects for nine billion people if the global economy will go ahead on the mainstream growth path producing greenhouse gases and consuming natural resources.
4. Communication infrastructures for the global society. For the first time in the history of mankind, the new communication technologies make a global exchange of information, knowledge and news possible in real-time. New, virtual, cross-border cooperation areas are thus created and at the same time hitherto unknown modes of data control and supervision.

Processes of education are to be focused on a guiding principle with four targeted dimensions of development, economic performance, social justice, ecological compatibility, and good governance. These provide orientation for responsible evaluation, judgment, and action. In the light of the target conflicts between the four dimensions of development and the need for coherence, we are searching for sustainable synergies and ways to overcome (or alleviate) such

conflicts against the background of a variety of cultural and socio-economic situations and interests as well as human rights. Education for sustainable development has given important stimuli and had an integrating impact in the context of the UN decade with the same name (2005-2014).

In view of growing challenges, children and youth need to develop sustainability competencies for their own life and environment and for their professional and social future perspectives. Systems of education need to enable such qualifications, as the globalization of economy and society constantly changes the fields of activity and hence also the profiles of qualification for the employees in almost all sectors and fields of profession.

The Design of Curriculum

The design of curriculum is a general pattern that describes the existence of the substance or the existence of the curriculum, the mapping of the components in particular set. The mapping is based on the point of view of the curriculum developer.

The formulation of curriculum design can vary from one developer to another. This is due to the difference in the point of view associated with the curriculum components. When the curriculum is viewed as having components consisting of objectives, content, organization, and evaluation, the design is formulated to create curriculum patterns which can map the components in an arrangement, so that it allows us to examine the interrelationships of each component.

The design that maps the curriculum components is in a reciprocal relationship which allows us to recognize all components and their connection. In addition, this kind of mapping pattern can guide us to develop a curriculum that can solve educational problems encountered, such as creating relevant educational programs with the community needs. The design can be illustrated as follow:

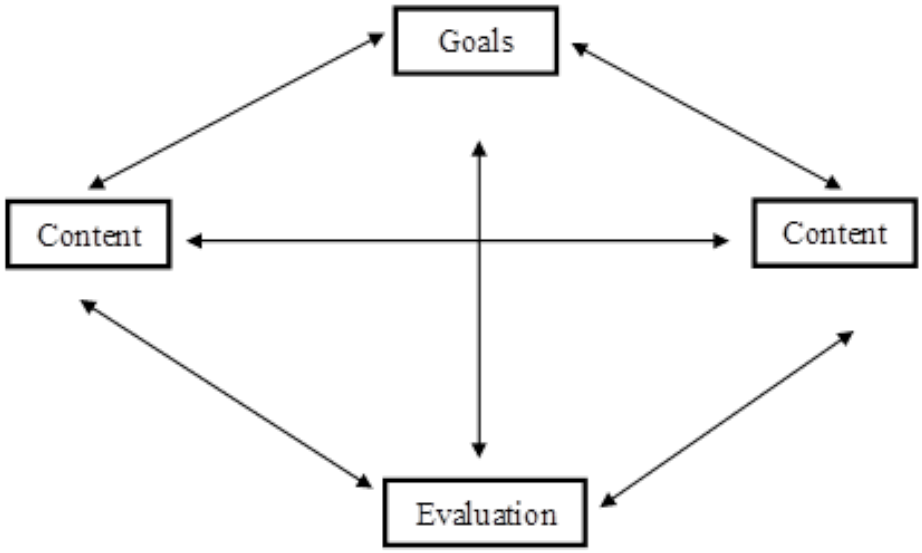

Figure 5.2: Curriculum design

The above curriculum design illustrates the mapping of curriculum components in a reciprocal arrangement. In the design, it can be seen that each component of the curriculum is related to one another. In addition, this design places the goal as the first component in the development of the curriculum. The vertical line indicates that goal connects directly to the evaluation. This means that after the formulation of objectives, the activity should deal with formulating a tool to assess the achievement of the objectives. It should be noted, however, that the vertical line has a reciprocal direction, which means that there is mutual relation between objectives and the evaluation.

In the picture above there is also a line that stretches from the left side towards the content component. This line is moving in both directions. This suggests that the objectives also relate to the content which must also relate to the objectives. The horizontal line that links the content to the organization also directs in two directions, which means that the content has been formulated in accordance with the curriculum objectives, and the learning organization should be relevant to the content of the curriculum. Reciprocal lines from

and to each component show that the components are intertwined. Therefore, their alignment can help achieve the curricular goals.

Problems that may arise in connection with the use of the above design is in determining which component becomes the priority in developing curriculum. The answer to this question depends on what form of curriculum will be developed. As an illustration, if the curriculum form is a subject curriculum, we tend to empasize on the content component. In the case of activity–based curriculum, the emphasis is on learning process component

The curriculum form which is mostly applied in our country can be categorized into the curriculum of subjects, or curriculum compiled by applying the concept of academic curriculum. This means that the curriculum deals with the study of the subjects. Therefore, in the development of the curriculum, objectives are formulated with reference to the subjects.

Components of Curriculum

Components of curriculum cover objectives, content, organization of teaching and learning experiences or method and evaluation. The followings are the discussion.

Objectives

Curriculum objective is the direction or goal that will be addressed by the process of organizing education. In every activity, it is a must to have an objective, because it leads to what is to be achieved, or it becomes a description of the end result of an activity. By having a clear idea of the desired results, an effort will be conducted to achieve that objective. Here, the objective is defined as a specific

statement of educational aim or goal which delineat either general or specific outcomes. Whereas, goals are defined as general statements of the educational purposes or aims. The purpose can come from inside and outside. However, wherever the source is, every desired objective directs the activities undertaken.

There are two types of goals in terms of the time needed for their attainment. Sometimes achieving a goal takes a long and short time. The goal that the achievement takes a long time is called the long-term goals. Meanwhile, those which needs short time is called short-term goals. The long-term goal is an integral part that achieves a step in achieving long-term goals. So it can be said that the existence of long-term goals is the ultimate goal of an activity. To achieve the ultimate goal, several steps are taken through the achievement of short-term goals, whose existence becomes an intermediary of achievable goals. The intermediate purpose is called the intermediate goal, and there is also an immediate goal. Thus, the existence of these short-term goals includes intermediate goals and objectives.

Regarding the curriculum as a means of achieving educational goals, the ultimate goal is the goal of education or school goal. This goal cannot be achieved in a short time. To achieve that goal, it is conducted through the steps of achieving the intermediate objectives, which are narrower and shorter in terms of time, i.e. the curricular objective or subject goals. Nevertheless, intermediate objectives often require immediate steps of achievement, i.e. goals that describe the results of an activity in the process or the purpose of teaching.

The chart below illustrates the types of goal level, as well as its relationship to a particular curriculum level, and its accomplishment steps.

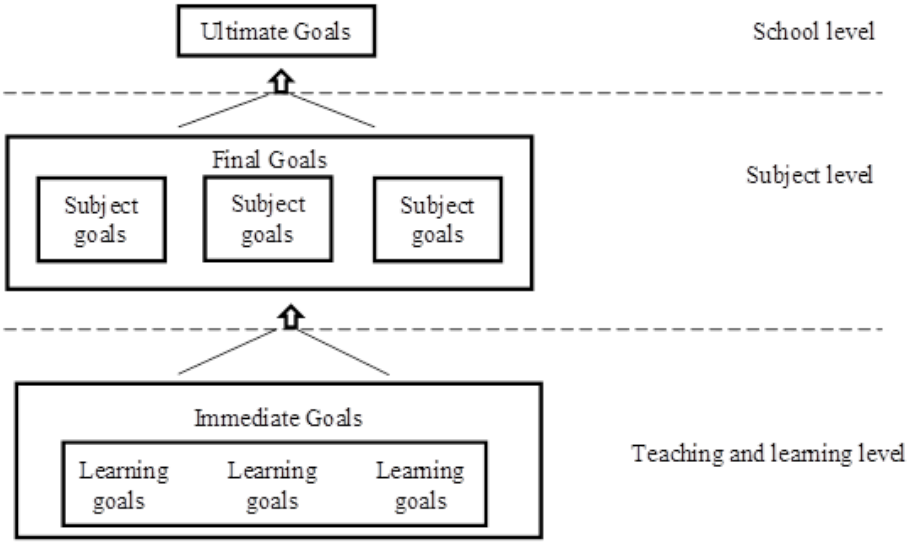

Figure 5.3: Levels of goals in relation to curriculum level

As can be seen in the illustration (Figure 5.3), either the ultimate, final, or intermediate goals are immediately on a single frame. This entails that the real goal to be achieved is the ultimate goal. To achieve the goal, one needs to go through the narrower goals which relatively shorter. The objectives at each level when linked to the level of the curriculum is the ultimate goal at the school curriculum level. The final goal is related to the study/subject curriculum level, and learning objectives of the lesson and the immediate goal are linked to the teaching and learning level.

Contents

The learning experience that students get from school becomes the content of the curriculum. Students undertake various activities in order to gain the learning experience. These experiences are designed and organized in such a way in order that students can achieve the objectives.

In determining the type of experience, sometimes the purpose is used as the reference, sometimes on the contrary, the content becomes a reference. This depends on the concept, design, and reference of the philosophy used. If the learning experience takes precedence, then the goal refers to it. Conversely, when the goal is preferred, then the learning experience refers to the goal.

The curriculum content is formulated based on the overall student learning experience. As explained in the previous chapter, that view of the curriculum creates a form of the curriculum of experience or curriculum of activity. Since the main emphasis of the curriculum is on project activities related to the understanding and solving the problems in life and social problems surrounding it, the curriculum is not oriented to subjects or lessons. This kind of curriculum is integrated, i.e. not explicitly giving the boundaries of subjects. Therefore, the existence of curriculum content is a kind of guidance for teachers and students in organizing activities which are oriented to understanding and solving problems in life and social issues.

In the view of curriculum as a learning plan, especially based on the concept of academic curriculum, curriculum content is a subject that must be studied by students. The existence of the contents of the curriculum is a formula of learning materials taken from various disciplines.

The thoughts about the content of the curriculum are directed at what kinds of lesson materials are possible to be better learned. This thought is basically based on the study of the value of mastery learning of the students. In relation to this, the question that becomes the basis of the content study is more valuable for the students. If the facts are considered more valuable to be studied, then the contents of the curriculum are facts taken from various disciplines. Conversely, if the basic idea is considered more valuable,

then the curriculum contains a number of basic ideas taken from various disciplines.

Nowadays, the thought about the contents of the curriculum tends to emphasize the basic ideas of various disciplines. These basic ideas are called the structure of science, whose existence is fundamental to many subjects including basic concepts, propositions, laws, or theories. A structure is greater in value than facts because facts are easily forgotten. The structure contains the principles in general. If this is really mastered, it will be difficult to forget and can be transferred to a new situation, or can be applied to the relevant situation.

The failure that often occurs in academic curriculum education is caused by the content that only consists of a variety of facts related to a field or a single subject only. In the mathematics curriculum for example, if the contents of the curriculum are only a matter of doing mathematics problems, without the opportunity given to students to find concepts, propositions, related law, the content will be easily forgotten. On the contrary, if the curriculum contains general principles, and questions referring to them, then the students will be able to apply the principles and concepts in a wider range of related situations.

It is not easy to determine which includes basic ideas and facts. For this reason, in determining contents of the curriculum, the involvement of experts in related subject areas is required. They are more competent to decide which should be included as the content of the curriculum.

Organization and Methods

The curriculum organization shows the understanding of how the curriculum content in the form of learning experiences is organized and delivered to the students. The organization is closely

related to the selection of method of teaching and learning in the implementation of curriculum which is determined by the patterns used in designing the curriculum.

The form of organization itself is determined by the form or type of curriculum. Thus, the curriculum forms also affect the method of teaching and learning. A child-centered curriculum, for example, emphasizes to shape the whole person. Therefore, the role of curriculum materials or content is not so prominent, because the most important is the learning process that can provide experience in accordance with the needs of each student, both physical, and psychological according to their talents and interests. In general, this form of the curriculum is the learning process in the form of a project, just as it is carried out in the curriculum of the activity or the experiential curriculum. This can be seen, for example, in the works of John Dewey in the Laborartory School and Ellsworth Collins with Project Curriculum. Both are considered as activity-based curriculum. Such curriculum implementation does not teach the subjects to the students, but the students do activities related to daily life through the undertaken projects. Thus, they can gain meaningful experiences for life.

The contents of the curriculum as described above are organized in an integrated manner. In this kind of organization, the boundaries between the subjects are eliminated, so the learning experience that the curriculum content centers on the learning units may be studied from the perspective of different disciplines. With such organization, the existence of the teaching and learning process is not focused on studying the subjects, rather making the subject as a means of approaching the problem of study focus. This can enable each student to gain a learning experience that suits their interests and talents, and can psychologically be a means of personal development.

Comment on the application of curriculum concepts that emphasize personal development as a whole is that this kind of curriculum is

beneficial, especially from the point of view of the development of students. Through this kind of curriculum, children will form their personalities. Their talents can be channeled and developed, as well as their interests and abilities so that each student can manifest or actualize himself. However, in terms of scientific and technological developments, this kind of curriculum can be hampered because in the process of education applying this form of curriculum, the role of science in the form of other curricula into prominent contents can be ignored. If this kind of long-term educational process takes place within a particular community, it can cause a lag in science and technology.

In the lesson-centered curriculum, the contents of the curriculum are organized in the form of subjects. The educational process leads many students to learn those subjects. The question that is raised about the application of this curriculum is what is the most important for students to learn. Should all branches of science be included in the curriculum?

We know that the development of science and technology is very rapid. Because the progress that humanity has endured in science and technology has been remarkable, it is impossible to master all existing science in a short time. Therefore, a curriculum developer should use a variety of considerations in determining what types of lesson materials are incorporated into the curriculum.

Although the development of science in the last decade has reached a high level, when observed carefully, especially from the point of view of experts in related disciplines, there are fundamental ideas in every discipline of science. The main ideas are not too fast developing. What is growing rapidly is the fact of the results of research, as the application or development of the main ideas. Bruner (1960) names these basic ideas with the structure of science. This structure is important to learn by students, for the following reasons:

1. Understanding the main idea to make a person has a broad

understanding of a field.

2. The main idea can be more easily remembered for long period of time.
3. By understanding the underlying idea, one will be able to transfer or transfer to a new situation.
4. By reexamining key ideas in learning, it can narrow the gap between basic knowledge and broad knowledge.

Now, we have come to a question, how to learn this structure? In the traditional teaching-learning process, teachers often teach something by giving information only, even though the teacher himself realizes that teaching in this way has many weaknesses because of various abilities of the students. Therefore, in the process of teaching and learning, Bruner suggested to use discovery method.

The development of science and technology turned out to have a significant effect on education. The concepts and principles of science and technology today are widely applied in the field of education, as well as the hardware devices of modern technology that have been widely used in education. Today, the application of the concept and use of technology in education is known as educational technology. Curriculum in today's era applies educational technology. This can be seen in the application of an individual teaching system involving a program or software tool, called instructional courseware or a hardware device of teaching and technology, such as a computer programmed for teaching and learning, called a computer based instruction (CBI).

It is very important to note in the design of curriculum development, especially related to organizational elements and methods is about how the educational process should be done. This must necessarily refer to what goals are to be achieved and the nature of the curriculum itself. By doing so, we do not fall into the wrong place in the preparation and the development of the curriculum.

Evaluation

Evaluation is critical in for curriculum implementation. Evaluation results can provide guidance on whether the target can be achieved or not. In addition, evaluation is also useful for assessing whether the curriculum process is running optimally or not. Thus, feedbacks on the implementation of the curriculum needs to be obtained through evaluation.

The curriculum evaluation should be done continuously. Therefore, it is necessary to first clearly establish what will be evaluated, using clear reference and benchmarks. In relation to the design of this curriculum, evaluation is conducted to achieve two main objectives:

1. Evaluation of the curriculum product or product;
2. Evaluation of the curriculum process.

Evaluation results aimed at assessing the extent to which the students have achieved the goals. In other words, this evaluation aimed at achieving the achievement of goals. Process evaluation assesses whether the curriculum implementation process is running optimally, enabling the achievement of the objectives. Both kinds of evaluation are very important to conduct as a basis for reviewing the curriculum and its implementation. So that it can be used as a basis for the review to enhance the effectiveness.

For better data in the curriculum evaluation, the principles of evaluation should be standardized. The principles are as follows.

1. Evaluation refers to the purpose. As stated at the beginning, the main function of evaluation is to assess the success of goal achievement. In order to be clearly understood whether the implementation of the curriculum has achieved the objectives, the evaluation should refer to the formulated objectives. Based

on the data obtained from the evaluation, further study can be done whether it is needed to revise the goals or to conduct a further study about the reason of the weakness or the advantage of the curriculum in achieving the goals.

2. Evaluation is done thoroughly. It often happens, we do curriculum evaluation in certain parts only. This means that evaluation is done only on the results, or the process alone. Sometimes evaluation of outcomes or process evaluations is made only on certain parts of the chart, e.g. evaluation of results is only cognitive. Similarly, process evaluation, sometimes only concerns the availability of tools or the establishment of discipline alone. If such things are done in the the evaluation, then they are not comprehensive in identifying what should be evaluated. The curriculum should reach the broader aspect, including the learning outcomes, the process, as well as the usefulness of what is learned for life. This is not an easy job. However, if it is done carefully by using relevant techniques, it can provide sufficient benefits for the curriculum itself.
3. The evaluation must be objective. Decisions made on curriculum evaluation results should be made based on actual data. The data is derived based on the results achieved by certain collection techniques. So what is described is seen as a realistic one. If all the decisions are made with objective data, then the curriculum can be an effective tool in the educational process, since all improvement and changes are always based on empiricism.

Conducting evaluation by adhering to the above principles can use various techniques. These techniques sometimes take the form of objective data collection from students, sometimes from the outsider (community) view of the curriculum used in the school. Both of them should be the basis of consideration in the evaluation.

System Approach to Curriculum Development

The preparation and development of the curriculum require a certain approach. An approach that is considered the most rational and effective one today is the system approach. With this approach, all curriculum components and their relationship can be analyzed.

Meaning of System

A system can be interpreted as a unity consisting of elements that are interconnected with each other to achieve certain goals. If we examine the problem with the system approach, then we must study what purpose and the relationship are between the elements of the system. This is done to generate a rational decision about the achievement of goals. Thus, it can be said that the analytical system study is basically a kind of thinking method to solve a problem.

A review of the system should be carried out in at least three components, namely the process, input, and the output. The relationship among the components can be illustrated in the chart below:

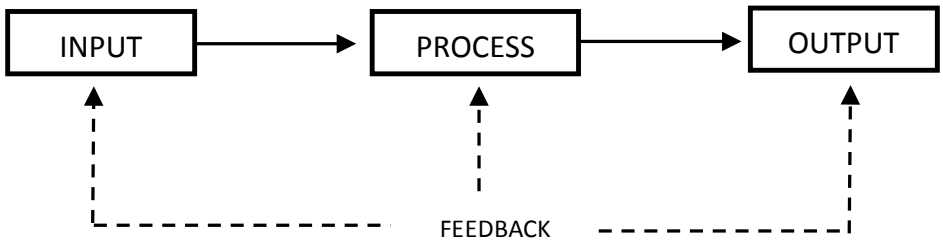

Figure 5.4: System analysis

Input is the raw material to be processed. The process is the activities in which the input is dealt with so that certain results are obtained. The output is the result obtained in accordance with the objectives. The results can be reversed, as a basis for improvement, both in the input and in the process.

A curriculum which is based on this point of view, is regarded as a system. The interconnectedness of its components is described in Figure 5.5:

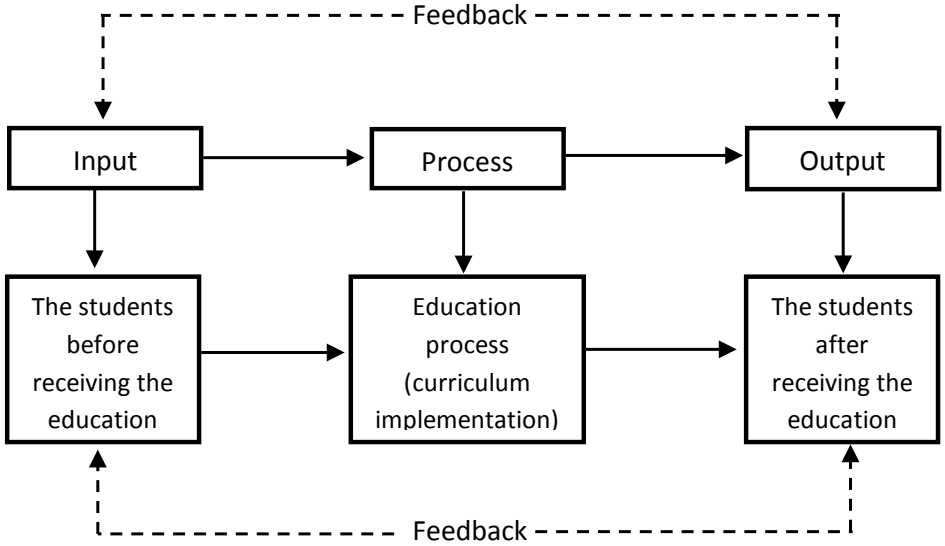

Figure 5.5: The application of system analysis in curriculum design

Based on the above chart, system analysis can be applied in assessing the curriculum. The chart illustrates the components of input, i.e. the students before experiencing the process of education; the process, namely the implementation of curriculum; and output that is the students after experiencing the content of education. The application of system analysis in the curriculum can be done based on the study of the of the curriculum components, i.e. objectives, content, processes, and evaluation. In its application, it needs to formulate system design as the preparation.

System Design in Curriculum Development

System design is a common pattern or pattern in developing a system. In essence, the design of the system is our pattern in

analyzing a system to produce a new system. In the preparation and development of the curriculum, the design of the system means the general pattern using basic analysis. The system design for the development of curriculum comes from the understanding of the system and the curriculum system as can be seen in the chart below.

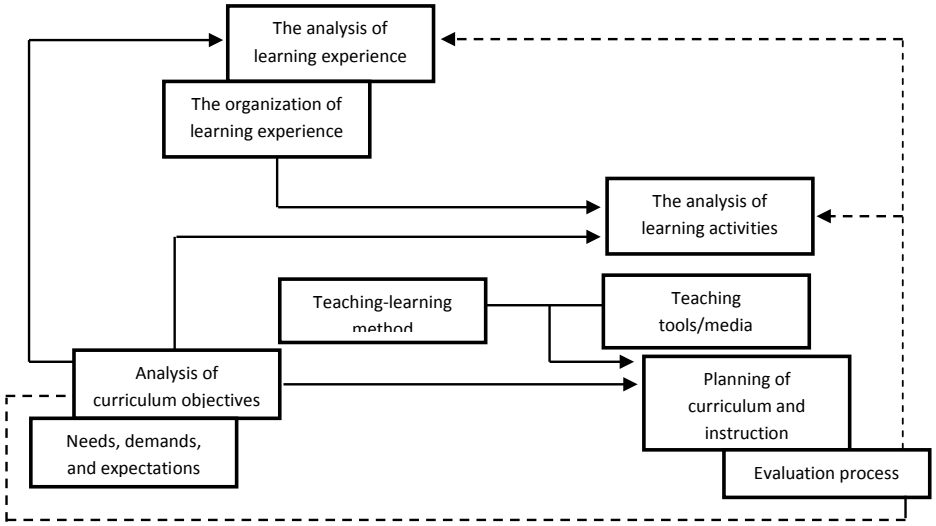

Figure 5.6: design system in developing curriculum

In the above diagram, the solid line (___) shows the direction of activity, while the dotted line (----) shows the direction of feedback. The beginning of activities in curriculum formulation (at the macro level) is to analyze the needs, demands and expectations of education. Based on this needs analysis, the goal is formulated. At the micro level, i.e. in the curriculum development of the field of study, the goals can be directly elaborated from the objectives that have been formulated in official circumstances. So, curriculum developers just map out these goals into more operational goals.

Based on the formulated objectives, the analysis of learning experiences selection and organization is conducted. In curriculum development, this is directly taken from the official curriculum by taking into consideration the facts, especially regarding the factors

of society. The objectives of the curriculum are also used as the basis for formulating evaluation plans and their implementation, as well as the analysis of learning activities, involving methods and tools. As shown in the figure, the results of the evaluation are reversed to review the objectives, the learning experience that the curriculum content, and the teaching and learning activities for the sake of improvement.

The Steps in Curriculum Development

The preparation and development of the curriculum can take steps 1) goal formulation, 2) determination of content, 3) selecting activities, 4) formulating evaluation.

Goals formulation. As described above, objectives are formulated based on an analysis of the various needs, demands and expectations. Therefore, objectives are formulated by considering the needs of society, students' needs, and science and technology development.

Contents selection. The contents of the curriculum is a learning experience that is planned to be obtained by students during the learning. This learning experience can take the form of studying subjects or other types of learning experiences according to the curriculum itself.

Activity organization. Organization activities can be formulated in accordance with the objectives and learning experiences and the contents of the curriculum. This process must be based upon the form of curriculum used.

Evaluation formulation. Curriculum evaluation must be formulated with referece to the objectives of the curriculum, and with regard to evaluation principles, as they are described above. Evaluation needs to be done to obtain the feedback as a basis for making improvements. Therefore, evaluation needs to be done continuously.

The steps as described above are made based on the design of the curriculum feeding system. Further details of each step can be seen in the following chapters which will be discussed in sequence/ one by one.

Chapter 6

Curriculum Objectives

In carrying out its functions, every educational institution has always a desire to determine the form of its graduates. The graduates should at least have knowledge, skills, and attitudes, as an effect of the learning experience. What is expected from the outcome of education is called general objective or goal.

The purpose of education as a statement of desire about educational outcomes reflects a broad and narrow range. Objectives reflecting the broad coverage are general, therefore it is called general objectives, while the narrow sphere is specific and is called specific objectives. General objectives describe the student's overall personal form, while the specific objective is a description that describes the characteristics of the individual.

The general term of a goal is relative. This is meant to be a goal of describing the people to be relevant to the national expectation. This kind of goals describes the national character in which it is applied to every school and is the source of all the objectives of the various levels of the formal school. At a lower level, the school wishes to deliver students to attain behavioral changes which deal with particular knowledge, attitude, and skills.

To achieve the general objectives, the schools need a more detailed description that can describe the forms of knowledge, attitude, and skills expected to be possessed by their graduates. This

kind of objective describes the shape of the school curriculum to be implemented Davis, 1977). While the outline of the school curriculum objectives will result in more specific forms of behavioral changes achieved from the teaching-learning processes, i.e. the purpose of teaching. In order to give the pattern of specific behavioral changes, the objectives can be described into more specific one so that it can be observed and evaluated.

Based on the above description, the objectives can be grouped into three kinds, namely:

1. Long-term objective or goals
2. Intermediate objectives
3. Immediate or specific objective

The general objectives of national education are clearly achievable after a long-term education process, in accordance with the level of education followed. Then, the curriculum and school objectives become the intermediary. To achieve the objective of the school curriculum, the learning process which also has an objective is conducted. This objective is achieved immediately after the completion of the study.

The classification of objectives is not intended to make a distinction, this is done to facilitate the discussion of this term so that it can produce a more systematic one. A narrower or more specific kind of objective becomes description for achieving a more general objective. Therefore, what will be achieved from the educational process is the general goals which can be obtained through specific objectives.

The Goals of Education

Education plays important roles in the national development. In the context of development, according to UNESCO concept, as

stated in the book written by Delors (1993), education should be carried out to equip students with the four most significant skills required in a pluralistic society. The four skills are known as pillars: 1) knowledge (learning to know), 2) skills (learning to do), 3) the ability for self-actualization (learning to be), and 4) the ability to live with other people in a plural society (learning to live together).

Learners in their capacity of society members should acquire abilities related to various aspects of knowledge. The knowledge that has developed rapidly today is not possible to be learned all. Therefore, there should be a selection according to the levels of importance and function. The types of knowledge that should be acquired are thoseconsidered important and functional for the lives and field of works of the citizens with a relative level of mastery according to the education level, subjects involved and the types of professions being practiced.

The abilities related to skills are also similar. These days so many types of skills have been developed. If the skills are related to the use of several products of science and technology, the skill types will even continue to develop. Therefore, in order to learn skills, education institutions should offer various skills which are useful and appropriate to the level of mastery adjusted to one's level of education, types and fields of particular vocational, and professional subjects.

The ability to actualize oneself in relation to optimum self-development is in accordance with each individual's potentials and interests. Theoretically, everyone has their own unique potentials (like intelligence, talents, and skills obtained from training/education) as well as interests or goals at hand. In reality, not everyone can develop their natural potentials optimally nor realize their goals or interests. The ability to realize these depend on how education can facilitate and assist learners to actualize themselves (self-actualization) according to their potentials and interests or goals.

The ability to live alongside other people in a plural society is very much related to the ability and willingness of a person to accept that social life is naturally varied. God created human beings with differences, in culture, habits, religions, races, etc. The willingness to embrace differences is vital so that in many ways people would be able a to cooperate towards a common goal. Education should be able to facilitate and enable every learner to live alongside other people in diversity.

From another perspective, in the context national development, education has four main goals, namely: 1) personal development, 2) employability or work skills development, 3) citizenship development and 4) transmission and transformation of culture (Ali, 2015).

With respect to personal development goal, it is based on a principle that every individual possesses a unique talent, intelligence, and characteristics. The development of such traits can be facilitated through education so that the individual can positively develop his/her personality traits according to his/her unique talents and abilities. Lack of education often results in less positive behavior and inappropriate or less optimum development of his/her talent and intelligence. Therefore, education should be a process of self-development towards a positive character and optimum potentials of its participants.

Education also has the goal of developing skills and other professional abilities required to thrive in the workplace or to become a productive member of the society. Every person cannot escape from the demands of fulfilling one's and one's family's basic needs. The efforts of fulfilling these basic needs are carried out by earning incomes through economic activities, such as job or productivity. This requires skills and abilities available through education.

As a citizen, there are rights to be obtained and obligations to be carried out. A right is something that should be or can be

accepted by someone in a certain position and is endowed by other parties, government or individual. Rights imply obligations from other parties who are obliged to give one as stated in the existing provisions of law. There are also rights and obligations as regulated by religious teachings and social norms, which are universal, national or local. Someone who acquires the rights as citizen implicates the State's obligation to give those rights. For example, every citizen has the right to security, which means that the State is obliged to protect and guarantee the security of its citizens.

Every citizen has rights in which the State must ensure its fulfillment. In addition, a citizen has obligations in which one should carry out and are subject to the State/government demand. Every citizen should be able to recognize their rights, including basic human rights and any other person's rights and basic rights, which means that the person involved is obliged to fulfill the rights of the State or the other person. The information on rights, rights holders, and/or obligations and duty bearers can be acquired from various existing provisions of law as well as universal, national, or local religious and social norms. The education develops understanding and awareness of rights and obligations of every citizen.

The goal of education which is related to the transmission and transformation of culture is aimed to maintain and preserve the culture of a nation which becomes the characteristics and identity of the nation. For example, within the context of Indonesian education, one of the functions of education related to the culture transmission is aimed to preserve Indonesian culture, which is the nation's own uniqueness and identity. As widely known, Indonesia has a diversity of culture. The culture which becomes Indonesian characteristics and identity can disappear if it is not passed on from generation to generation through the means of education. In addition, education can also bring a cultural transformation by developing culture into a better and more advanced one.

The formulation of education functions stated above is universal in nature, which means that it applies to many countries in the world. The countries acknowledge that they implement education to achieve the four functions and based on the four pillars. In implementing education, every country has its own system related to its national interests from which national education goals are formulated. Based on the national education goals, curriculum and school objectives are formulated.

Development of Multiple Dimensions of Intelligence

The achievement of the purposes of education as stated above is in line with the efforts of improving the talent and intelligence of learners. The talent or aptitude is the capacity to learn or the potential ability to learn. Generally, talent is a potential ability possessed by a person to achieve future success. The potential ability will only transform into real useful skills after a person finishes his/her training or education. In the next stage of development, talent is defined as an individual's ability to carry out a certain task without depending much on education and training.

In many cases, talent affects the studies' results. If a lesson is learnt according to one's talent, the result will be better. The education process should pay attention to special aptitudes of the students and give them stimulus in order to discover and develop their talent. Education that takes into account the students' aptitude, will give a more optimum outcome. In addition, intelligence is another type of individual potential that needs to be developed. The aim of education to advance human intelligence encourages the development of theory and concepts related to intelligence. Intelligence develops along with the birth of new ideas and innovations related to the key factors of a person's success and in relation to a person's attempt at achieving happiness in life.

There are various concepts of intelligence formulated by various scholars. Some of them define intelligence as the ability to understand the world, to think rationally and to use resources effectively when faced with challenges. According to Gregory (2000), intelligence is the ability or the skill to solve a problem or create a valuable product within one or more cultural constructs. Other definition states that intelligence is multiple abilities to achieve various, possibilities. This ability can develop or diminish according to the motivation and relevant educational experience in of a person. In the classical concept, intelligence consists of three components: (a) the ability to direct thought or action; (b) the ability to change something; and (c) the ability to change oneself.

The revolution in theory and concept of intelligence initially came about since the creation of Intelligence theory and its measurement method called Intelligent Quotient (IQ). This theory had been developing since the early 20th century. It became a phenomenal finding because for the first time mankind was able to reveal the mystery of human intelligence with a relatively accurate measure. Intelligence test measured by IQ points was initially developed by Alfred Binet and Theodore Simon, French psychologists. This Binet-Simon method was then revised in 1911 by Lewis Therman, an American psychologist. His main contribution was the numerical index which states intelligence as the ratio of mental age and chronological age. This revision was called Stanford-Binet Test. The test is further developed by Carl Brigham who designed a new version of IQ test known as the Scholastic Aptitude Test (SAT).

The uniqueness of IQ thinking pattern lies in the rational and logical thinking which is often compared to computer intelligence. At the beginning, intelligence is understood to be linear and mathematical. In reality, IQ is still the easiest method to measure a person's ability. School enrollment, talent and interest analysis, and employment selection process, all implement a set of formal

IQ tests. However, is IQ the only factor contributing to a person's success? Gardner (1999) explains that the intelligence scales used by many people today still had their own limitations and therefore it is unreliable to use them for predicting a person's future success.

Gardner (1999) formulated an understanding of the concept of multiple intelligences by correcting the conventional way of looking at intelligence. According to Gardner, intelligence is not limited only to intellectual intelligence measured through various limited intelligence tests or a person's academic achievements in his/her school grades. Intelligence is also reflected by a person's skills in art, spatial skills, sports, communication and his/her care towards the environment.

Multiple intelligences according to Lazaer (2000), are the latest development in the field of intelligence which explains the channels/ways the human-beings use to become intelligent. The ways to make a human as an intelligent-being are the basis for the classification of multiple-intelligence. Based on such a theory, Gardner stated that there are seven types of multiple intelligences. A research conducted by Lazaer (2000) enriched Gardner's theory by adding the last type of multiple intelligence: naturalist intelligence.

As result of further research developments, there may be more types of multiple intelligences discovered in the future. But for now, there are at least eight types of intelligence, as explained in the following paragraphs:

1. Verbal/linguistic intelligence

   Verbal/linguistic intelligence is a part of multiple intelligences related to a person's sensitivity to noise, structure, semantics, and functions of words and languages in conversations, discussions, and reading. This type of multiple intelligences can also be seen in the form of effective usage of words, orally or in writings, including the ability to manipulate language syntax or structure,

phonology or sound in a language, semantics or meanings of language, and pragmatics or practical usage of language. The language usage includes rhetoric (influencing other people to take action), mnemonic (using language to memorize information), explanation (using language to make an explanation) and meta-language (using language for self-discussion). The characteristic of a person who has high verbal/linguistic intelligence is the love to read, write, tell stories, play word games, etc.

2. Logical mathematical intelligence

   Logical mathematical intelligence is a part of multiple intelligence related to a person's sensitivity in seeking and finding patterns used to calculate and think abstractly as well as logically and scientifically. This intelligence can be seen by a person's ability to find differences in logical and numerical patterns as well as the ability to make a long and structural argumentation in a logical and scientific manner. The types of process used in solving mathematical logics include categorization, classification, inference, generalization, calculation and hypothetical tests.

3. Intrapersonal Intelligence

   Intrapersonal intelligence is a part of multiple-intelligence related to the sensitivity of introspecting oneself and compares it with other people's strengths and weaknesses. This intelligence involves having an accurate picture of oneself (strength and limitations of self), the awareness of personal feelings, intentions, motivations, temperament, and wishes; and the ability to be disciplined, understanding oneself and to feel confident. The characteristics of a person with intrapersonal intelligence are free attitude and way of thinking, strong will, self-study and work, the ability to learn from past experiences, precise expression of mind and feelings, and the ability to direct an activity towards the designated objectives and the possession of a hobby.

4. Interpersonal Intelligence

   Interpersonal intelligence is a part of multiple-intelligence related to a person's sensitivity of distinguishing and responding to other people's behavior. This kind of intelligence comes in the ability to motivate and communicate with other people, work in a team, and benevolence with other people. This type of intelligence also includes the ability to perceive and distinguish various modus, intentions, motivation, and feelings of other people. This intelligence also involves the sensitivity towards facial expression, sound, and gesture, the ability to distinguish between different interpersonal signs, the ability to effectively react towards those signs in a pragmatic way (for example influencing a group of people to join him/her in an action).

5. Naturalist intelligence

   Naturalist intelligence is a part of multiple-intelligence related to the sensitivity in appreciating the surrounding nature and environment. This intelligence can be seen from a person's love of nature and environment as reflected in his/her active participation and awareness of the environment and natural conservation.

6. Kinesthetic and body movement intelligence

   Bodily kinesthetic intelligence is a part of multiple intelligence related to the sensitivity and aptitude of controlling the coordination of body movement through rough and soft motor movement, such as skillful usage tools, jumping, running, making a sudden stop and the aptitude of conducting rhythmic or dance movements, martial arts, etc. This intelligence is manifested in the ability to use the entire body's potentials to express ideas and feelings (such as actor, pantomime, sports athlete or dance), the ability to use hands to produce or transform a material (such as crafter, painter, mechanics, or surgeons). This ability also involves special bodily aptitude such as coordination, balance, strength, flexibility, speed, tactile and hectic abilities.

7. Music-Rhythm Intelligence

   Music-rhythm intelligence is a part of multiple intelligences related to the sensitivity in listening to a voice, music and other sounds. This type of intelligence can be seen from a person's ability to produce and appreciate rhythm and music and reflected in the ability to perceive (for example, playing music), distinguish (for example, assessing music), and express (for example, practicing music) all forms of music. This intelligence involves the sensitivity to rhythm, melody and other musical sounds.

8. Visual-Spatial Intelligence

   Visual-spatial intelligence is a part of multiple-intelligence related to the sensitivity to collaborate visually and mentally-perceived activities (using eyes) as well as the ability to transform visual-spatial perceptions such as practiced in painting, designing patterns, and designing a building. This intelligence involves the sensitivity to colors, lines, shapes, measurements, space and the connection between those elements. It also involves the ability to visualize and graphically expresses visual and spatial ideas as well as precise self-orientation into a spatial matrix.

Multiple-intelligence developed by Gardner stresses that a person can gain success in many ways with the strategy of focusing. The processes involved are learning and producing (a work or an achievement) something out of the learning process. Someone who studies music to the point where he/she can compose or arrange a song to a string of beautiful melodies like Mozart is a person who is intelligent, if not a genius, in the field of music-rhythm intelligence. Basketball athletes who practice hard to attain worldwide achievements, such as Michael Jordan, is said to have high kinesthetic intelligence.

These findings changed the paradigm and approaches used in the world of education, which include a new understanding for students and parents that a child's intelligence can be manifested in various forms. A child may be weak in a certain subject but is exceptionally

smart in another subject. Therefore, an attempt must be made to focus the child's study on the fields that he/she is good at. In the past, a child with a low IQ (such as below 100) is perceived as not smart. However, in the present day, parents should be aware that their children might be gifted in other areas.

The Gardner theory was then developed and complemented by other experts. One of the most famous experts was Daniel Goleman who wrote a famous book titled Emotional Intelligence. Goleman (1995) tried to emphasize on human interpersonal intelligence. Emotional intelligence can be defined as the ability to align emotion and logics, the aptitude of recognizing and processing emotion, the skill to motivate oneself, the ability to develop empathy and the skills to maintain social relationships.

He stated that the coordination of feelings is the core of a good social relationship. If a person is good at adapting his emotion with another individual's emotion or is empathic, s/he is considered to have a good emotional level and it will be easier for him/her to adapt in a new social environment. Furthermore, He said that emotional intelligence is a special ability a person has to motivate her/himself, to face defeat, to control emotion, to regulate desire and to manage the inner condition. With good EI, a person will be able to manage his/her emotion and regulate his/her mood.

According to Goleman (1995), emotional factor is essential. It provides a rich concept into interpersonal intelligence. There are five areas of personal intelligence in terms of emotional intelligence. They are the ability to recognize one's own emotion, the ability to manage emotion, the ability to motivate oneself, the ability to recognize other's emotions and the ability to form/maintain relationships.

Formulation of emotional intelligence theory shows that a person's success is not only affected by his/her academic achievements. Especially in the professional and social world, the ability to relate to other people and to place oneself in the right position highly contributes to a person's success. There are a lot of students who

make great achievements at school, but are poor at processing their emotions, for example easily upset or get or desperate or arrogant that their academic achievement only does little to help them thrive in the society. In fact, emotional intelligence needs also appreciation and needs to be developed among students since early age because it will become the basis of a person's skills in the society which makes it possible for the optimum development of the person's potentials.

The latest development on intelligence theory, complimentary to the previous findings, is the theory of spiritual intelligence. This development was introduced by Zohar and Marshall (2001) who defined spiritual intelligence as the ultimate intelligence. If an intellectual intelligence is based on logics, ratio, and intellectuality, whereas emotional intelligence is based on emotions, then the spiritual intelligence is based on the soul's intelligence.

Intellectual intelligence works in an outward manner (eyes of the thought). Emotional intelligence processes the inside of human feelings (ears of the thought). Spiritual intelligence (SI), on the other hand, refers to the "center of the self" condition (Zohar and Marshall, 2001). Spiritual intelligence is related to the enlightenment of the soul. Those who have high SI are able to assign positive meanings to experiences in the event, trouble, or even suffering. By assigning positive meanings, the person will be able to resurrect his/her soul and do positive action or deeds. People who possess spiritual intelligence are always full of happiness due to acceptance and meaningfulness of the self.

Aside from intellectual intelligence, there is another type of intelligence known as moral intelligence, which also holds an important role in a person's success (Coles, 1997). This is characterized by the ability of a student to appreciate himself or herself and other people, understand the deepest feelings of those nearby, and to follow the existing regulations, in which they are the keys to future success.

As an individual, a student is required to communicate with his/her schoolmates, teachers and other people within the school

community. However, as a creature of God, students have the obligation to abide by the religion they practice. Therefore, a balanced relationship should be maintained between intellectual intelligence, emotional intelligence, and spiritual intelligence.

Based uponm the above discussion, intelligence theories actually complement each other. The dimension of human intelligence in the framework of education cannot be understood in a linear or monolithic way. Education cannot only focus on only one dimension of intelligence. All forms of intelligence must be developed simultaneously in an optimum proportion. Therefore, education will find its essence as an attempt at developing human as a whole.

The awareness about the importance of intelligence, especially emotional and spiritual intelligence for the success of a student living among the society is acknowledged by people from all walks of life. It has even become an issue often discussed among education experts, even though the implementation is still far from adequate. Formal educational institutions (from schools to universities) are often restrained by formal regulations and curriculum targets which only emphasize on the cognitive aspects of learning evaluations. Therefore, it requires creativity among all elements of education is needed to develop education model which gives priorities to the students' emotional and spiritual dimension.

School objectives and Curriculum Objectives

School objectives are often referred to as institutional objectives. While the curriculum objective is also called the lesson objective of particular subjects.

The purpose of the school reflects the expectations to be achieved through education at a certain level or type of school. Each level of education, even every type of educational institution has a different purpose from others. A certain level of education has an objective that

describes the level of learning outcomes that students can achieve. For example, the objectives of elementary school describe the level of the learning experience in both basic knowledge and skills, while the objectives of junior high school certainly reflect a higher level of learning experience above the elementary school.

Similarly, high school objectives reflect higher learning experience levels from junior high. However, because the levels of elementary, junior and senior high school education, as well as other types of vocational education institutions equivalent to senior high school are the order in the formal education system. So, the learning experience acquired by students at a certain level of education can be continued on the above level. This is consistent with the principle of sustainability in the curriculum. However, since each level of education is also a terminal, the learning experience gained at that level of education can also be utilized, even though it does not proceed to the level of education above.

The objectives of educational institutions cover general and specific ones. At a certain level of education, this general objective can also be viewed as a long-term objective. Because it still describes forms of behavior that are still common. It does not yet describe the possession of behaviors related to knowledge or skills and attitudes related to certain areas. To reflect more specific expectations, each level and type of education also has the specific purpose of the school.

The purpose of having relationships has become a basis for developing other curriculum components. If an objective statement is still drawing on something general, it is difficult to explain the reference for the development of other curriculum components. Therefore, general objectives are translated into specific objectives. The specific objectives can become a basis for determining subjects as the content of the curriculum. To determine the subject matter that is the content of each field of study is based on the formulation of the objectives of the curriculum or the field of study.

The objectives of the curriculum or the field of study illustrate the forms of knowledge, skills, and attitudes related to the field of study and the school curriculum. Each field of study has its own objectives different from other fields of study. This objective becomes the reference of the forms of learning experience that students achieve after studying the field of study on a particular level. Therefore, such objectives can provide demands to school curriculum implementers on what materials can be developed and presented.

The Taxonomy of objectives

The objective of teaching describes the form of behavior or abilities that students will obtain after the learning process. This type of objective is divided into two, namely general and specific objectives

The behaviors described in the general teaching objectives illustrate the behavioral trends. This form of behavior is difficult to observe or measure. Therefore, to facilitate the achievement, it should be operational, observable, and measurable in order to be translated into specific teaching objectives.

The formulation of teaching objectives can be made in a variety of ways. Often, the objective formula describes what the teacher will do in the teaching and learning processes. When such formulation is made, it does not give students an objective to learn so as to obtain certain results. For example, teachers formulate a teaching objective: "To show students how to set up laboratory equipment". This describes what the teacher will do. This does not describe the learning outcomes that students will gain. As a result of the teaching process, the teachers only undertake the activities as defined in that objective. So, when the activities have been carried out, they think that job is done without considering students'involvement in learning. Therefore, a short form of learning outcomes to be achieved by students through teaching and learning processes need to be formulated by teachers.

The desired learning outcomes of the students are in the form of behavior change. Bloom, et al (1956) classified the form of learning behavior into three kinds. Bloom, et al., Named the classification "The taxonomy of educational objectives". Taxonomy of educational objectives consists of three domains:

1. Cognitive domain
2. Affective domain
3. Psychomotor domain

Cognitive domain includes the development of intellectual and knowledge abilities. This is related to the ability to think; to obtain knowledge and logics. The psychomotor domain includes the ability to coordinate physical movements and to use motor functions. This is related to the ability to do an activity which involves the use of body part and the ability related to physical movement. Affective domain includes things related to emotions such as feelings, appreciation, enthusiasm, motivation and attitude.

Cognitive domain deals with behaviors related to thinking, knowing and solving problems. This domain has six levels. The lowest level shows the ability of simple, while the highest show complex ability. The order of that ability (starting from the lowest) is:

- Knowledge
- Understanding
- Application
- Analysis
- Synthesis
- Evaluation

Knowledge. Knowledge refers to the ability to remember the previously learned material. Knowledge can be broad and narrow material. What is known is just information that can be remembered or recalled so that this level of ability is the lowest one.

Understanding. The ability to understand the materials, such as explaining and summarizing.

Applying. The ability to understand the meaning of a material, such as interpreting a material that has been studied into a new situation with different, methods, concepts, principles or theory.

Analysis. The ability to decipher or translate something into components or parts, which is more understandable. This capability involves knowing the parts, the relationships between the parts and the principles used in the analysis of organization to support generalization.

Synthesis. The ability of synthesis shows to assemble a part into a whole. This includes formulating the theme of a plan, or looking at the abstract relationship of various information or facts. In another word, anlysis is a kind of ability to formulate a new pattern or structure based on various information or facts.

Evaluation. The ability to make an assessment of something based on a specific purpose or criterion. The criteria used may be internal (such as the organization) or external (its relevance for a particular purpose).

Of the six levels of ability above, it can be concluded that the ability to deal with knowledge and understanding only requires lower order thinking skills process, while the application, analysis, synthesis, and evaluation require a higher order thinking skills process.

Marzano and Kendall (2007) a new taxonomy of educational objectives. Based on their concept on a system of thinking, they formulated the new taxonomy of cognitive domain as the correction to Bloom's taxonomy on cognitive domain. According to their concept, there are six hierarchical levels of the cognitive domain, namely; 1) retrieval, 2) comprehension, 3) analysis, 4) knowledge utilization, 5) metacognition, and 6) self-system of thinking.

The six categories are classified into three systems of thinking, namely Cognitive system, Metacognitive system, and Self-system. The

first one, that is the Cognitive system, hierarchically consists of four levels of thinking, namely Level 1(the lowest level) is Retrieval;. Level 2 is Comprehension; Level 3 is Analysis; and Level 4 (the highest level of the Cognitive system) is Knowledge utilization. The second system is categorized as a Metacognitive system, which is the level 5 of the taxonomy and is called Metacognition. This ability denotes monitoring, evaluating, and regulating the functioning of all other types of thought. The third system is categorized as Self-system, which is level 6 of the taxonomy and is called Self-system thinking. According to Marzano and Kendall, 2007): "It is the interaction of attitudes, believes, and emotion that determines both motivation and attention. The self-system determines whether an individual will engage in or disengage in a given task, it also determines how much energy the individual will bring to the task"(p. 55).

Meanwhile, affective domain deals with attitudes, values, interests, appreciation, and social feelings. The affective level consists of five, from simple to complex. The order of levels is:

- Receiving
- Responding
- Believing
- Valuing
- Naturalizing.

Receiving. The ability to receive is the desire to pay attention to a particular stimulus, such as reading a book, listening to music or mixing with people with different races.

Responding. The ability to address the active participants in certain activities, such as completing structured tasks, obeying rules, attending class discussions, completing laboratory assignments or helping others.

Believing. The ability to accept the value system of individuals, such as showing confidence in something, appreciation of something,

scientific attitude or sincerity (commitment) to make the improvement of a social life.

Valuing. The ability to accept different value systems based on a higher value system. To realize the importance of harmony between the rights and responsibilities of the deed done, to understand and accept the advantages and lack of self, or to realize the role of planning in solving a problem.

Naturalizing. This is the highest degree of affection. At this stage, individuals who have a value system always align their behavior according to the value system they hold. Like being objective about everything.

Then, psychomotor domains include objectives that are related to manual or motoric skills. As with the other two domains, this domain also has many levels. The order of levels is from simple to more complex one that covers :

Perception. The ability to the use of the senses in conducting activities, such as to know the damage to the machine from a discordant sound, or connect the sound of music with a particular dance.

Readiness. The ability which deals with the readiness to do something of the activities (set) covering mental set, physical set, and emotional set to perform an action.

Mechanism. The ability which deals with the appearance of responses that have been learned and has become a habit, so that the movement shown indicates a proficiency. Like writing fine, dancing or organizing/ organizing labs.

Guided response. The ability of imitating or following, repeating actions ordered or indicated by others, conducting trial and error.

Proficiency. The full motor skills appearance. Skills that show usually fast, with good results, but use less energy. Like motor driving skills.

Adaptation. The ability which regards to skills already developed in the individual so that the concerned can modify the pattern of

movement in accordance with certain situations and conditions. As we see in people who play tennis, movement patterns tailored to the need to break opponents play.

Origination. The ability which refers to the creation of new motion patterns to suit the situation or problem. Usually, this can be done by people who already have high skills such as creating a method of clothing, music composition or dance.

In relation to the taxonomy of the educational objectives, students are expected to acquire the following domains:

1. Cognitive domain: students are able to master the knowledge, technology and academic ability to continue their study to a higher level as well as to be successful in developing their knowledge and career.
2. Psychomotor domain, students have the ability to communicate, life skills and adaptability with the development of social, cultural and natural environments in local, regional and global scale; having physical and spiritual health useful to perform daily duties or activities.
3. Affective domain, students have faith and obedience towards God Almighty according to their own religious teachings. The faith should be reflected in their behavior and attitudes; they have to possess ethical and esthetical values and practice them in their daily lives. They should also possess democratic, tolerance and humanitarian values and apply them in their social and civil life at national or global scale.

However, in actual practice, the educational objectives have not been carried out consistently in the education and learning practices. The learning process in school tends to emphasize on the achievement of cognitive (intellectual) domain through various learning approaches, strategies, and models. and overlooks the affective domain.

Even if the affective domain is carried out, it is made only as nurturing effect or a hidden curriculum inserted in the main learning activities of the cognitive or psychomotor domain. Conceptually and empirically, it is believed that the affective domain holds a very important role in a person's successful professional or personal life. Even so, affective learning is carried out and developed more outside of the formal school curricula.

The formulation of teaching objectives should use operational verbs which can represent the students' real ability. Each domain in the taxonomy can be demonstrated by the use of certain verbs. Even each level of each domain can be formulated by using certain types of verbs. The verb ' know ' for example shows the cognitive domain at the level of knowledge. While the verb 'realize' shows affective domain.

Nevertheless, the verbs can be used for formulating general objectives and specific ones. For expale, the verb ' kow' cannot be measured, this verb is used for general purpose formulas, while 'show' can be measured; this can be used for the formulation of specific teaching purposes. There are a lot of specific or operational verbs that can use by teachers in formulating specific objectives. However, in their formulation, teachers are getting stuck in realizing the attainment of specific objevtives. Their formulation of this type of objective is limited to narrow learning outcomes.

To avoid the dangers of learning that contain only some information about facts, teachers must be careful in formulating specific objectives. The main guideline is that teaching is not only aimed at achieving a specific objective but a higher general purpose. The use of this special purpose is only one step in achieving a higher objective. Therefore, specific objectives are formulated by elaborating general objectives and taking part as representative samples of the achievement of the general objectives.

Sources for Objective Formulation

Clear objectives formulation becomes a demand in the development of other curriculum components. They have tremendous benefits in curriculum development. The objective itself has various functions. Taba (1962), explains that objectives have at least the function to guide in determining the curriculum content, the forms of learning experience that students want to achieve and the determination of criteria used in determining what to teach and how to teach it.

Curriculum functions as a tool to facilitate students to achieve objectives. It needs some considerations in order to make effective objectives. The consideration is based on the sources of objective formulation used. Tyler (1970) suggests the following sources of curriculum objectives, namely:

1. Student needs both individual and social
2. The demands of contemporary life
3. Advice from experts from various branches of science.

Student needs.

A study of the needs deals with the practice in the field of psychology. This proceeds from a view that individual behavior always directed in order to meet the needs. These needs can be broadly grouped into biological needs and psychological needs. Biological needs are related to various lives that can support survival as biological beings, such as feeding, drinking, and sex. While the psychological needs associated with the mental atmosphere, such as the need for awards, recognized by the group or the need to manifest itself in accordance with its potential.

Conducting a study of needs is not solely based on the clustering as outlined above. There is a need for more detailed life needs, so the school can facilitate students to meet those needs. Therefore,

a needs assessment must be carried out as a basis for formulating objectives.

In addition, the study of needs is not solely about the individual needs of students, but the most important thing is to conduct a study of what is needed by the students and adults. So, it can give the prediction what the students will attain in their future learning.

Many needs studies have been done as a source of curriculum objectives. Schools that exist in Smithville, for example analyzes the needs of children, namely:

1. Health
2. Social relationships are included in the family, with friends and acquaintances
3. Socio-civics relationships, including in school and community settings
4. Consumption
5. Position or occupation
6. Recreation.

Another example is the results of research conducted by Doald C. Doane (Nasution, 1987, p.71) about the needs of students as a youth. The results showed that the youth felt the wholeness in terms of:

1. Job
2. Living philosophy
3. Hanging out with others
4. Moral
5. Marriage and family
6. Use of leisure and leisure time
7. Finance
8. Relationships with other sexes

9. Health
10. Sex and repression
11. Religion
12. Relationship with family
13. Social skills
14. Traditional subjects
15. Other interests.

The examples mentioned above are not intended to be used as guidance in making the results of the study of the needs of children as a source in formulating objectives. The most important thing, in this case, is that before we develop the objective is necessary to study the needs of children. The study can use a variety of methods, for example by interviews, questionnaires, observations or other methods that can be used in social studies. Because it is not impossible that the results of studies conducted are different from what is produced by others. This is because the differences in terms of social conditions, economics, and even the geographical location of the community affect the different needs.

The demands of life

Human life is always evolving, in line with the progress achieved, both in science and technology. The demands are always changing from period to period. In traditional societies, for example, the demands of life are still simpler compared to the modern society. Nevertheless, there are types of contemporaries that apply contemporarily, independent of the various changes or patterns of life. The demands of this kind of life need to be studied to be a source in the formulation of curriculum objectives.

The demands of life are more than just necessities. Demands have more meaning than necessity because it has to do with society

in which it is most needed for the survival of society. Need, on the other side, refers to the individual in the survival of both biological and psychological life.

In examining the demands of life, many experts have different views. Demands in the field of knowledge, for example, there is a post that the old cultural values need to be inherited to students. There is a view that the most important is what is most essential in life. Jerome S. Bruner (196) strongly prioritizes the importance of structure as the basic idea of the sciences as most needed. While his opponents consider sharing new information or facts very important in life.

When we look at the outline, as individual needs, the demands of life that need to be considered as the source of the objectives concern the aspects that can be grouped into aspects of health, family, recreation, occupation, religion, consumption and citizenship. Based on this survival life can be sustained by these aspects. This can also be seen as a contemporary demand for life.

Studies conducted by Virginia State Study (USA), as taken from Tyler (1970, p.20) classify contemporary life demands as follows:

1. protection and conservation of life
2. natural resources
3. production of gods and services and their distribution of returns of production
4. consumption of goods and services
5. communications and transportation of goods and people
6. recreation
7. expression of esthetic impulses
8. expression of religious impulses
9. education
10. extension of freedom

11. integration of the individual
12. exploration

Types of life demands on the results of study above can be used as a guideline. However, we need to be adapted the results to specific situations and conditions through relevant studies.

Expert advice

Another way to develop an objective is to seek the advice of various experts in different branches of science as a source. Experts in a discipline are people who know the extent and depth of field or discipline. They know more about the various concepts and theories in that field. Because they can suggest what is proper and not to be mastered by students. This development can be done by inviting experts in a conference, which is continued with the working committee in a team.

Development of Curriculum Objectives

The use of various sources in the development of objectives as described above can lead to the formulation of objectives. For functional purposes, it is necessary to note and use the following objective formula as benchmarks:

1. The statement of purpose shall describe the type of expected behavior and the content or context of its application. A lot of the objectives formulation describes the expected form of behavior, but in their formulation, the content of the curriculum from which the behavioral change can be realized is not explicitly covered. The statement of purpose of "developing logical thinking ability" can describe a form of behavior, although it is still general. But what content or subject matter used to develop that ability is not clearly defined. Therefore, the objective formula needs to be made

more specifically so that it clearly describes the expected form of behavior or content of the lesson. For example, the objective formulation "can distinguish or interpret models of curriculum developmen is clearer than the previous one. The advantages of this kind of formulation are to facilitate in achieving it, also in doing the success of learning.

2. The formulation of complex objectives needs to be elaborated so it will not obscure the type of expected behavior. A complex formula makes it difficult to develop objectives and evaluations. In general, a complex thing can be always interpreted. The objective formulation in which the students can "appreciate the beauty" can be interpreted variously. Therefore, it needs to be spelled out so that it does not cause multiple interpretations.
3. The objective formula should clearly illustrate which form of behavior will be expected through various diverse learning experiences. As it is known that the forms of learning experience are very diverse. In formulating objectives, it should clearly describe the behavior to be achieved, from a variety of learning experiences.
4. The objective formula should describe forms of behavior that can be further developed in different contexts.
5. Objectives must be realistic in order to be realized in the curriculum as well as in the form of classroom learning experience. Unrealistic objectives cannot be realized in the curriculum or classroom learning experience. Such a purpose will remain as a mere hope without reality. Usually, the formulations are made too grandiose and exaggerated so it is just beautiful in hearing and too ideal.
6. The scope of objectives should be broad so as to penetrate various forms of student learning outcomes that are the responsibility of the school. The scope of the objectives does not merely include the forms of learning outcomes. Their formulation must consider aforementioned aspects. Therefore, the objectives must be comprehensive.

The formulation of curriculum objectives that can meet the above criteria can be developed using various sources. It has been argued above that the sources of the objectives can be obtained from the studies about the students themselves, the demands of life or advice from experts in the field of study. In order to develop objectives so as to produce a good formula, the curriculum designer or developer must use the philosophical, psychological and sociological foundations as described in the first chapter.

Formulating Sustainability Curriculum Objectives

In formulating curriculum objectives, we need to consider many factors. Factors, such as students'needs, the existing of learning resourses are the bases for the formulation of objectives. Therefore, when we develop curricuulum at the acertain level, the needs and resourses analyses must be conducted.

With respect to sustainability education curriculum, the objectives must be formulated based on the sustainable development goals (SDGs) as has been mentioned in the previous chapter. They should aslo be based on 21st century challenges and aspirations, and values and skills that lead to sustainable and inclusive growth, and peaceful living together. To create a more sustainable world and to engage with sustainability-related issues as described in the SDGs, individuals must become sustainability change-makers. They require the knowledge, skills, values, and attitudes that empower them to contribute to sustainable development. Education, therefore, is crucial for the achievement of sustainable development. However, not all kinds of education support sustainable development. Education that promotes economic growth alone may well also lead to an increase in unsustainable consumption patterns (UNESCO, 2017).

Further, UNESCO (2017) explains: "...the now well-established approach of Education for Sustainable Development (ESD) empowers learners to take informed decisions and responsible actions for

environmental integrity, economic viability and a just society for present and future generations (p. 6). Therefore, it aims at developing competencies that empower individuals to reflect on their own actions, taking into account their current and future social, cultural, economic and environmental impacts, from local and global perspectives. Individuals should also be empowered to act in complex situations in a sustainable manner, which may require them to strike out in new directions; and to participate in socio-political processes, moving their societies towards sustainable development.

The general steps in the formulation of the curriculum objectives should consider:

1. Analyzing needs
2. Analyzing the source of the destination
3. Developing school objectives
4. Developing the type of learning experience
5. Describing the objectives of the school according to the scope and sequence of defined learning experiences
6. Developing the objectives of the field of study
7. Developing lesson materials
8. Describing the purpose of the field of study
9. Developing general teaching objectives
10. Elaborating the general objectives into the specific teaching objectives.

At the lowest level of the curriculum (or instructional level), it is the teacher's regular duty to formulate the objectives of the lesson. It is because teaching is the kind of behavior that students are expected to have after the teaching and learning process. These types of objectives are common and some are special.

The purpose of general teaching objectives describes the form of learning outcomes that students are expected to achieve. This

objective formula uses verbs that describe common behaviors, such as knowing, understanding, using, applying or appreciating.

The often-mistake made in formulating the objective is the form of described behavior does not base on the student's learning activities but on the teacher's activities. To produce the objective formula that can describe the learning outcomes obtained by students, Gronlund (1987) provides the following guides:

1. Each teaching objective begins with operational or specific verbs (such as know, understand, appreciate and so on).
2. The objective is based on students' performance not on teacher performance.
3. Each objective should describe the learning outcomes, not the learning process.
4. Each objective should describe theterminals behavior, not the teaching materials covered during the course of teaching.
5. Each objective should cover only one type of learning outcome that is general, not composed of various learning outcomes.
6. Every objective at its level of announcement should clearly indicate the expected learning outcomes so that it can be limited by specific forms of student behavior.

For the practical purposes, the general objective is not described using observable or evaluable forms of behavior. Therefore, general objectives formulation needs to be elaborated into specific objectives, so that it is easier to achieve through teaching. However, as a curriculum developer, teachers should always refer to the general objective when they formulate expected learning objectives.

In formulating instructional objectives, operational verbs (or action verbs) that describe behaviors that students are expeted to to achieve must be used. The verb forms such as " indicate; differenitiate; or monitore" are included into oprational or specigfic verbs. The

techniques of analyzing the general objectives for formulating specific objectives are:

1. Formulate general purpose/objective
2. List a number of verbs that can support the achievement of the general purpose/objective as an indicator (instructions)
3. Select from a number of indicators reflected in the most important verbs as a way to achieve the general objective (selected indicator)
4. Formulate the selected indicator into the formulation of a special purpose.

Meager (1962) states that the formulation of specific teaching objectives has observable and measurable features. This is intended to be known if the program objective is achievable. There are ways to formulate the special purpose as follows:

1. Specifically, declare the form of behavior to be achieved
2. Limit in which circumstances behavioral changes are expected to occur
3. Specifically, state the criterion of behavior change in the sense of describing a minimum standard of acceptable behavior as a result achieved.

The objective formula with the above characteristics can be used as teacher guidance in developing other curriculum components. Thus, any curriculum development effort, especially at the level of teaching, should pay attention to the objectives as the form of expected behavioral change.

Chapter 7

Curriculum Content and Organization

The development of curriculum contents requires a strong and thoughtful basis. It is due to the fact that the school as an institution will lead the students to the maturity level. This maturity covers many aspects, both physically, mentally and socially.

Physical maturity is generally characterized by maturity in biological terms. This can be achieved by the individual who has entered a certain age. t It is different from mental and social maturity, this type of maturity cannot be attained without any meaningful guidance. The mental maturity that shows emotional maturity is an integral personal embodiment. While social maturity is based on the ability to live independently. Therefore, facilitating students to reach maturity level is considered as difficult task to be carried out by the school. To achieve this maturity, individual student needs to acquire relevent and significant learning experiences.

. As we know, the progress in various branches of life causes the development of life's demands. This can confuse curriculum planners or developers in determining what type of meaningful learning given to students.

If the duration of education is sufficient to provide the provisions of the learning experiences to students, the problems faced are not that great. But the reality shows that many demands to be met by educational institutions, while the time available is limited. Therefore,

it is necessary to select the contents of the curriculum, so that the process of education in schools can reach the target.

Selection of curriculum needs to be done for several reasons, namely:

1. What should be included as the contents of the curriculum requires a variety of considerations and criteria, so that the contents of the curriculum are adequate for students to run their life.
2. Rapid progress in the field of science and technology with limited school time allotment makes it impossible for the students to achieve the target.

On these bases, the question that can be asked in determining the contents of the curriculum is what can be asked in deciding what the curriculum content and what priority is to be used as the learning practice of the students in the school. Based on these concerns, rational activities need to be developed to select and develop the forms of learning experiences that become the content of the curriculum.

Criteria Used to Choose Curriculum Content

The selection and determination of the contents of the curriculum depend on the level of curriculum development. The curriculum at the school level is certainly different from the level of the study field or the level of teaching. At the school level, the content of the curriculum mainly contains subjects or areas of study that can be taught. At the level of the study field, the content of curriculum mainly deals with the subject that can be taught. The curriculum is the main unit of activity. At the level of the subject area, the curriculum content is in the form of topics that can be submitted and covered by the relevant fields. While at the level of teaching, there are core materials of the subject.

The criteria that can be used in determining the contents of the curriculum is presented by Hilda Taba (1962) as follows:

1. The contents of the curriculum must be valid and significant.
2. The contents must hold on to social realities.
3. The depth and breadth of the curriculum content should be balanced.
4. The content of the curriculum reaches broad goals, including knowledge, attitude skills.
5. The contents of the curriculum should be learned and adapted to the student experience.
6. The contents of the curriculum should be able to meet the needs and attract student interest.

The content of the curriculum is valid and significant with regard to fundamental science. This includes the central ideas or contemporary theories of a particular branch of science. Bruner (1960) termed this with the structure of a scientific discipline. According to him, by studying the structure of science, students will achieve a better level of ability because this has a wider transfer value.

Nowadays, science has developed rapidly. If all the branches of sciences should be studied, it takes a long time to learn them. In addition, if all information is merely related to a loose fact, the transfer value is also low. But if what is learned is a general principle or the main idea of a science, the learning outcomes can be transferred more broadly because the main idea can cover a number of facts or information related to it. With this way, the mastery can be transferred more widely.

Our question with respect to this view is how to determine a lesson materials as the contents of the curriculum relevant to the structure of science. We need to find out the expert in the branch of related science. Therefore, expert assistance is indispensable as

the appropriate way of determining the contents of a valid and significant curriculum.

Not all the lesson materials that are determined by the content of the curriculum is relevant to the demands of life,. especially in modern times like today. The demands of life in modern times are higher and more complex. This leads to the emergence of certain requirements need to be fulfilled by everyone who wants to enter the employment field. In order for schools to adjust their education to the demands of life, the contents of the school curriculum must take into account the various facts that occur in the social environment. So, curriculum contents would be more relevant to students' life. Another criterion of curriculum content is the balance between depth and breadth. This guides the notion that the content of the curriculum must have a balance between width and depth. The breadth of the scope has much to do with the amount of deepening of learning, as well as the number of lesson materials that can be learned. For example, -in the implementation of the curriculum or teaching, the presentation of materials through lectures could cover extensive materials but not profound ones. If the delivery is done by inquiry or discovery method, then only the level of depth is achieved. Therefore, consideration in determining the content that can meet this criterion is reviewed from the selection of the materials as well as the possibility of the method used to deliver the materials. To achieve this condidtion needs an adequate balance between breadth and depth.

The contents of the curriculum are developed based on the objectives to be achieved. The objective formulation includes various aspects of behaviorial changes that students expect to achieve either knowledge, skills or attitudes. Although the emphasis of achievement is not always among the three aspects. In mathematics, for example, the main emphasis is on the knowledge aspect (cognitive), notwithstanding both aspects of skills and attitudes. Studying ethics or moral education deals with the aspects of attitudes, without ignoring the other two

aspects. Nevertheless, materials that become the contents of the curriculum should be able to reach the aspects of behavior that can be covered in the objectives. This does not merely include one type of purpose or one behavioral aspect.

The criteria for selecting curriculum contents have a broad sense. This is not mainly related to the order of materials. Psychologically, the levels of individuals development have implications to the ability to learn something, as well as the experience they have. If the selection of a material does not take into account such psychological factors, it is likely that the material will not be effectively studied, because it is incompatible with the level of the students' mental ability or experience.

In general, individual lives should also be addressed in selecting learning materials. Even when it is realized, it can eventually become a necessity. The contents of the curriculum taken from the aspects of life can meet the needs and interest of students. Another point concerning this need can be viewed from the point of the psychological study. Based on the psychological study, individual needs differ from each other. However, in general, the need can be generalized. The study of student needs as set out in the previous chapter can be the basis for determining the contents of the curriculum.

Besides, the criteria as a benchmark in choosing the contents of the curriculum, we must use the general principles for selecting students' learning experiences. Tyler (1970) argues that the general principle in choosing the learning experiences includes into curriculum contents is as follows:

1. The purpose to be achieved by students must have a learning experience which gives them the opportunity to practice the type of intended behavior stated in the goal. Thus, if the goal is to expect that students have the ability to solve health problems for example, then the learning experiences should provide opportunities for students to do health problem solving activities in the real situations.

2. Learning experience should be able to give satisfaction to students through the implementation intended behavior as desired in the goal. This can be accomplished by choosing forms of learning experiences that guide students using the best way to display the behavioral form. In solving health problems for example, learning experiences provided should facilitate students to be able to solve problems, as well as the ability to use the best way to solving health problems. This will provide satisfaction in displaying the desired form of behavior in purpose.
3. The learning experiences should be within the limits of the possibility of students being actively involved in the process of obtaining them. This can happen when the determination is taken into account about the limits of students' abilities, both psychologically and academically.
4. Many forms of learning experience can be used to achieve a certain goal. They should be selected carefully so that they become the most suitable ones for implementation.
5. Learning experiences that should be pursued to achieve a kind of behavior also simultaneously can give students to develop other ability

The development of criteria in choosing the curriculum content which is based on the above principles is helpful, especially in choosing the topic and the lesson material. The selection of topics is related to the development of curriculum content at the level of the field of study compared to the level of the teaching curriculum.

Further, development of curriculum content can be made in the form of a large teaching-learning integration. This will ease the implementation of the curriculum in the classroom. The section will be elaborated on the process of selecting topics as the contents of the curriculum and the development of teaching program outlines.

Nowadays, as we have entered the 21st century, the education is facing the challenge of providing the learners with the twenty

first century skills. According to Trilling and Fadel (2009), the skills focus is on critical thinking and innovation, digital literacy, and career and life skills.

Critical thinking skill and innovation. Twenty first century life demands every individual to have capacity in solving complex problems. In this regard, the content of curriculum should be focused on the contents which facilitate learners to acquire critical thinking and problem-solving skills, communication and collaboration skills, and creativity and innovation.

Digital literacy. Among the twenty first century features is the rapid flow of information due to the advance of digital science and technology. In regard to preparing learners for being adapted in this particular situation, the content of curriculum should be focused on fulfilling their needs to acquire the skills to appropriately access, evaluate, use, manage and add to the wealth of information and media they now have at their thumbs and fingertips.

Career and life skills. The competitive era in twenty first century demands every individual to have skills for the career he/she takes and the life skills. These skills are related to flexibility and adaptability, initiative and self-direction, social and cross-cultural interaction, productivity and accountability, and leadership and responsibility. Therefore, the curriculum content should include these particular skills.

Concerning the skills, they need to be information literates so that they can access information efficiently and effectively, evaluate information critically and completely, and use information accurately and creatively. The content of curriculum, therefore, should also provide learners with the capacity to become digitally literate and ICT (information and communication technology) literate, as well.

To recapitulate the twenty first century skills, Trilling and Fadel (2009) suggested that competencies education is required to provide, in its teaching and learning processes, with what the so called 7 Cs

(seven competencies), namely:

1. Critical thinking and problem solving
2. Creativity and innovation
3. Collaboration, team work, and leadership
4. Cross-cultural understanding
5. Communication, information, and media literacy
6. Computing and ICT literacy
7. Career and self-reliance.

The seven competencies are connected with the traditional concept of three Rs (Reading, wRiting, and aRithmatics) which every learner should acquire from the education process. Concerning the 21st century teaching and learning processes, the 7 Cs are better combined with the 3 Rs and the combination results in the formula of 7 Cs x 3 Rs which needs to be included in the twenty first century teaching and learning processes.

Topic Selection Process

Lesson topics that are related to the learning experiences is expected to be obtained by students in school. The learning experiences include many aspects, whether related to the science of knowledge, or other aspects of life. Forms of curriculum, such as subject-centered curriculum, the activity curriculum or core curriculum affect the content covered by these topics.

The subject-centered curriculum takes subjects or disciplines as the focus. Such topics are taken from the subjects of Natural Science, Mathematics, and so forth. Curriculum activities take the function of the topic of life, such as life in the household, neighborhood, community environment, production, and so forth. As the core curriculum takes a general education-oriented topic, content which

is seen as an essential aspect of every individual to be mastered must be selected.

The breadth and depth of a chosen topic are relative. Depending on the purpose of choosing the topic as a lesson that becomes the content of the curriculum. Therefore, in choosing and determining the topic, several things need to be considered carefully.

Steps of Formulating Topics

The process of selecting the topics as the contents of the curriculum is done by taking the steps as follows:

1. Identify the topics expected to be used as materials for students to learn to achieve the goals set. In this step, the first thing is the nature of the goal to be achieved. Therefore, it is important to examine whether the purpose describes knowledge, skills, and attitudes that must be possessed., Furthermore, it should also be questioned the quality of the content knowledge of skills and attitudes that must be owned or mastered

   The followings are the tools to identify the topics included into learning materials:

   a. Analyze each goal to find out the essence to be achieved and to analyze the source of that goal from a more general or higher purpose.

   b. Identify the expected topics to be material in the process of achieving the goal

2. Selects relevant, functional, effective and comprehensive topics for the achievement of the identified objectives. A relevant topic is the topic that actually contains things that are covered in some general teaching objectives. For example, a teaching objective that has been identified as follows:

   Objectives of the field of study: knowing and trying to use the

principles of democracy. These goals are translated into teaching objectives:

a. Knowing and understanding that in taking a decision in a representative body of people required the most votes
b. Understanding that the principle used by the people's representative institutions prioritizes deliberation to reach consensus, but if it is not possible, decisions are made by majority vote.
c. Implementing the results of decisions taken based on the principle of mutual funds or with the most votes with honest and good faith.

The teaching objectives in points a and b essentially are demanding that after following the education program (social study) students have knowledge and understanding of the decision making process in the democratic system. The question is whether the principal issue and the concept relevant to be used as the material. Various alternatives need to be owned to determine the choice.

To achieve the above objectives, as an illustration, it can be identified various alternative materials that can be used as the contents of the curriculum, because the main purpose is to have knowledge and understanding the quiet decision-making process in the democratic system, various alternative materials can be proposed as follows:

1) President elections from various republican democracies.
2) The process of drafting the law within the democratic countries.
3) Elections as a democratic institution.
4) And so on.

In order that the chosen topic is functional and effective, we seek to question whether the topic can really function effectively in

achieving the goal. This depends on the subjective judgment. However, by asking the question as above, it is expected to encourage us to try to think and continue to review the proposed alternative, so we can ask whether the identified alternatives have been done completely.

The point is that we must always remember the position of an objective in the functional relationship with curricular goals. The knowledge and understanding of the decision-making process in the field of representation of the people are one of the goals for achieving knowledge and understanding of the principles of democracy. Therefore, one question that should be asked is whether the topic chosen comprehensively allows for the study of matters relating to the principles of democracy in general. The proposed topics in the above alternative allow us to teach the notion of democracy and democracy itself.

Dealing with the time allotment in achieving the goals, the question that needs to be addressed is how long the topic will be effectively studied. If it is only a one-time meeting, it is not a topic that is intended as the content of the curriculum at the level of study, but rather the topic as a curriculum content at the level of teaching. Therefore, the development of topics for the curriculum level of the field of study are topics that are expected to take at least four meetings.

Based on the above description, it can be summarized that the steps of determining the topic as the contents of the curriculum are:

1) Analysis of the nature and purpose of teaching
2) Identification of alternative topics which, according to estimates, can be used as lesson materials to achieve certain goals.
3) Selecting one or several alternative topics to be used as a lesson subject with the following requirements:
    a. Relevant
    b. Functional and effective

c. Comprehensive

d. Broad that can be measured from the time it takes to study the topic effectively and efficiently for the achievement of the goal.

Source of Topic Selection

Under the process of identifying and selecting topics, questions are still asked, what can be topics? The topics can be concepts, theories, generalizations, laws, or propositions, issues of life or experience. In this connection, the formulation of a goal-oriented curriculum is not tied to any one kind of material. But it is only tied to the goal to be achieved. Therefore, the concept, theory, generalization that can be used to achieve a particular purpose could be selected as a topic.

Every curriculum planner or developer should master adequate knowledge, the discipline of science or life issues if they areidentified as possible topics. However, the selection of the topic requires mastery of the nature of the goal to be achieved. So, preference which is chosen as the contents of the curriculum is a topic for learning materials or the learning processes that are based on certain criteria as mentioned above. The selection is not made by a subjective estimation.

The process of further development of these topics is in the form of teaching program description. In this process of development, it will appear that the need for concepts and generalizations or principles and propositions lies in the necessary disciplines of science. A description of this is given in the next section, concerning the outline of the teaching program outline.

Designing Course Outline

The topics that have been selected for further study are developed and arranged in the basic course outline. Is this connection, it

needs to be explained the description in terms of development and preparation of basic course outline.

The term basic course outline refers to the outline of the teaching and learning program of a field of study, organized according to the functional sequence in chronologically ordered, the achievement of all curriculum objectives of a particular field of study, and a certain level of education. The use of the term development and breeding here is due to the work which will be the clear subject matter of the content and the extent. This means that a topic must first be spelled out into sub topics. It can, therefore, be estimated the time required and the degree of comprehension of the topic. If a topic cannot be broken up into a smaller sub topic, the topic does not contain comprehensive content.

For example, the topic of preparing the constitution in a democratic country. This topic leads to the acquisition of research by students about the decision-making process within the representative institutions of the people. To arrive at that understanding, students must understand the meaning of democracy, the rights and obligations of state institutions in the process of drafting the Law, the structure of power relations in the institution of a representative of the people in the democratic country, as well as the cases of the process of drafting legislation in a democratic country both the state and the inter-law cases that have been made.

The above example clearly illustrates that the topic can be developed into various subtopics. This kind of activity in the preparation of the basic course outline is called the development process.

When all the topics have been developed in the sub-topics, the next step is to organize the sub-topics into the unit of lesson material in the semester. Sorted by the functional hierarchy in time sequence, this process is called preparation.

Briefly, the process of preparing the course outline can go through the stages below:

1. Development topics into sub-topics
2. Organize sub-topics in units of semester units
3. Preparation of the unit into the relationship of functional hierarchies in the order of time leading to the achievement of predetermined objectives.

Activities in curriculum preparation are conducted by a team in which each member is responsible for the development. Team members who are responsible for developing course outline of the social studies field, for example, perform the task of arranging outline social studies coursework similarly with other members in the field of study or other activities. For interdisciplinary study, , such as a series of civic struggles or Civic education with Social Science education, the results of activities in curriculum development need to be exchanged with one another. So, it can be avoided the occurrence of overlap in the topic or other components.

Development of curriculum content at the more specific level of teaching is a teacher regular activity as well as development at the level of the field of study. Teachers must first develop objectives and formulate them into specific teaching objectives. Furthermore, based on the formulation of the purpose of special teaching, it is examined essentially and identified various alternatives of materials and sub-lesson materials by only selecting content that are appropriate to achieve the specific teaching objectives.

Curriculum Organization

The description of the curriculum method here is about how students gain a learning experience to achieve goals. The curriculum method is concerned with the process of achieving the objectives. While the process itself is related to how the learning experience or the content of the curriculum is organized. Every form of organization used has an impact on the process of experiencing the experience.

Based on the curriculum design, each component is dependent on purpose. The organization of the curriculum is also determined by the objectives to be achieved. Various changes to be achieved by students as formulated in goal affect the type of learning experience.

The organizational curriculum is a way of preparing materials or learning experiences to be achieved. Every form of organization affects the type of material, sequence, and method of learning it. The subject-based curriculum will be different from the activity-based curriculum. In the first form of the curriculum, materials are organized by taking them from the subject matter of the curriculum. This kind of curriculum usually puts more emphasis on intellectual education. While the form of the curriculum of both materials is organized based on experience or activities. This kind of curriculum pressure is on the complete personal formation.

Because every form of curriculum and organization emphasizes on certain aspects, the learning process will deal with the study of different materials. Therefore, the extension of the curriculum method is based on the curriculum organization.

Any form or pattern of the curriculum organization has advantages and disadvantages. There is no single best pattern. It depends on which angle we are reviewing the existing patterns.

In addition, the distinction of organizational patterns is primarily intended for theoretical studies. Because in the execution, there is no one pattern that is purely done as desired from that pattern. Thus, there are modifications in the implementation, although the main characteristic of the pattern used still stands out.

In relation to the discussion of these curriculum methods, it should be pointed out, that effective organizational patterns influence the learning process. For this reason, before we describe the various patterns of curriculum organization, it is necessary to first examine the various criteria of an effective organizational pattern. Thus in the implementation can be minimized the various weaknesses that exist in one pattern, although must make modifications

The Criteria of Effective Curriculum Organization

Criteria for formulating an effective curriculum organization according to Tyler are:

1. Continuity
2. Sequence
3. Integration

Continuity. It deals with the repetition of the main components of the curriculum vertically. For example, if in social studies lesson, the development of reading skill is seen as something very important, then reading practice should be done continuously or continually so that students have the opportunity to develop the skill. Similarly, in science studies lessons, if the subject matter on the concept of energy is important, then the concept must be studied continuously in various parts of teaching or science materials. Thus, the students' skills in reading or mastering the concept of energy can develop effectively through lessons at school.

Sequence. The sequence has a relationship with continuity. With this criterion, it is intended that the content of the curriculum is organized by sequencing the subject matter in accordance with the depth or breadth that it has. A material delivered at the first level is not very deep but in the next levels it will be deeper. The same thing applies to its breadth. For example, reading skills developed in social study lessons, in the first class can contain simple materials, but at the next level is more complex. Similarly, in Science, the concept of energy is taught simply, but at a later stage, it is getting more and more widespread.

Integration. The principle of integration means that the learning experiences provided to students must have a function and useful to obtain learning experiences in other sectors. Organizational learning experiences can help students to gain the learning experience

comprehensively. For example, learning a skill in quantitative matters in mathematics can also be used effectively in other subjects. Thus, the knowledge, skills, and attitudes acquired as learning experiences are not independent, but can be applied in various fields. Similarly, the concepts studied in social studies should also be sought to integrate them with other areas.

These three criteria can serve as guides in making the organization of the curriculum. It is not related to what form of organization the curriculum is being used. Because, basically, all curriculum organizations have material to be the content of that curriculum. The only difference is the type of material. Therefore, the criterion applies to what form of organization to use.

Organized elements include the concept, values, and skills. When this material is linked to a Bloom taxonomy, the concept relates to knowledge, values relate to attitudes, skills relate to skills. So if the organization will be done in social studies lessons, for example, the content of the outreach includes various concepts in the social studies, the values that students have, and skills need to be developed.

In order to obtain an effective curriculum organization, it should be noted that the continuity and sequence were applied in organizing the type of learning experience as material. The organized activities to learn the materials of curriculum has both advantages and disadvantages. Therefore, any curriculum development should see the advantages and disadvantages of each organizational form, in order to find a way to reduce weaknesses when a particular form is selected.

Subject Base Curriculum

The subject-focused curriculum organization contains lesson material drawn from the subject matter that becomes the content. This organization includes:

1. Separated subject curriculum
2. Correlated curriculum
3. Broad field curriculum

The separated curriculum consists of several subjects separated each other. This form belongs to the oldest version in the history of the curriculum. Since the Greeks and Romans, this form of curriculum had been used. Greeks taught school subjects, such as literature, math, philosophy, and science. While the Romans taught grammar, rhetoric, logic named as trivium, arithmetic, geometry, agronomy, music called quadrivium. The seven subjects in the trivium and quadrum were later known as The Seven Liberal Arts.

These subjects are arranged logically and systematically so that the students can learn them well. As a result of the use of this kind of curriculum, a new branch emerges in science, and the eyes of the kingdom grow.

The essence of this kind of curriculum organization is that it follows a good and logical discipline. Thus, both the content and the learning experience acquired are separate. The content of each subject is determined by the respective subject experts. The teacher, in this case, serves to find out how to get students to master the subjects as well as they can. Therefore, the most appropriate teaching method to use is the exposition - the delivery of the material. For this, the main source worthy and important in learning is the textbook lesson.

The subjects taught in the school are categorized into preferred subjects and are not preferred ones. It is based on the value of a subject that serves to discipline mentally. Thus, subjects that fall into such difficult categories as mathematics are preferred over others. Although for a particular individual, the subject has its own meaning.

The advantage of the most prominent form of separated subject organization is that the material is organized in a logical and systematic way. So the method for learning can be effective, as

well as the method for organizing knowledge. Thus, students can assemble as much science as effectively and economically as possible. When needed he can use that knowledge.

In addition, by studying the subjects, one can follow a certain science discipline, also become trained to use certain thinking systems as the power of intellectual development.

Another practical benefit is that since this form of curriculum has been used for a long time, it is common for many universities to set admission requirements based on the ability of the subject. Also, in general, teachers are accustomed and educated in the separate subjects. Thus, separated subjects are considered easier to implement.

Besides having various advantages, there are also various weaknesses. The most notable disadvantage is that the curriculum consists of separate subjects, cannot describe the ability to think actively and integrated. The contents of the curriculum is a cultural heritage of the past, not the problems faced in the present situation. This leads to the unnoticed psychological principle of interest and motivation. So, what is learned is often easy to forget, also not in accordance with the conditions faced and needed by students.

Both the correlated curriculum and broad field actually have the same principle as the separated subject, since they still have subjects. The difference lies in the scope and manner of organizing the material in subjects. In separated subjects, materials are grouped into narrow subjects, so that many subject types and narrow the scope of each subject. While in the correlated and broad field, subjects are connected to one another, so the scope becomes widespread. Even on broad filed, because similar subjects are merged into one field of study, it will further reduce the number of subjects and further expand the scope of each subject.

A correlated curriculum is a form of organization that links between subjects with other subjects. The relationship can be done both in any way and in a way. In a first way, the relationship between

subjects happens by accident, when a lesson material happens to have a link to another lesson. For example, in history lessons, if by chance the material taught has a relationship with the science and vice versa, the correlated curriculum is formed. The second way, the relationship is conducted by discussing a subject matter in connection to various subjects.

Meanwhile, *Broad field* is a curriculum organization is created by fusing the subjects of similar subjects in one field of study. Even the type of melting study field has only a name other than the name of the original subject. We recognize five broad fields in the curriculum:

1. Social studies, a fusion of geography subjects, history, civic education, economy, and the like.
2. Language arts, a fusion of subjects reading, grammar, writing, listening, language knowledge.
3. Natural sciences, natural limo burial, life sciences, chemistry and health.
4. Mathematics, smelting of hollow, algebra, angle, field, and space and statistics.
5. Art, a fusion of dance, music, painting, chisel, and drama.

Both forms of the organization of this curriculum have various advantages as follows:

1. Correlation of knowledge to be learned by students. The students learn a certain subject in an integrated manner. They will learn a subject where the subject is highlighted from the various subject disciplines of the course. Thus, their knowledge is integrated.
2. Students' interests increase when they see the relationship between subjects
3. Students' knowledge about things is deeper if obtained by an explanation from various subjects.

4. Correlation provides a broader understanding because it is gained from the various angles and not just from a subject.
5. Correlation enable students to use their knowledge more functionally. They have the opportunity to use knowledge from various subjects to solve problems.
6. The correlation of the instructional interface takes precedence over notions and principles rather than knowledge and facts.

In addition to the various advantages, there are also several disadvantages from this kind of organization. The weakness is it does not provide systematic and in-depth knowledge of the various subjects due to the wide scope of the field of study. Besides, in the implementation, many teachers still have an orientation to particular lessons. Their educational background is generally still segmented to the discipline, so they feel difficult to use interdisciplinary approach.

Another disadvantage is that there are still subjects although given in the form of correlation and fusion. This tends to cause a lack of interest. Because the subjects are not adapted to the needs and daily life problem.

Social Process and Life Function Curriculum

The curriculum is based on the social paradigm and life function with the side of the lesson material that is related to the daily life of the students. This kind of curriculum is known as life curriculum. The goal of this curriculum is to provide a meaningful learning experience for children with what is needed in daily life. So more emphasis is on social processes, social functions and problems of life.

The idea of life curriculum is basically derived from Herbert Spencer's, in 1860, view of the five categories of activities that can be used as educational goals:

1. Self-preservation

2. Securing necessities of life
3. Rearing and disciplining of offspring
4. Maintenance of proper social and political relations
5. Miscellaneous activities which make up the leisure part of life, devoted to the gratification of the tastes and feelings.

On the basis of the idea, the curriculum should not be intended to merely form the intellect as in the subject curriculum. But it is directed that students can learn something related to the function of life.

Among the benefits of life curriculum are:

1. Life curriculum takes lesson around the social process and life aspects. By making a classification of social processes or aspects of life, material organizations can be more meaningful. Because it prepares wider experience.
2. Allowing the use of the background of student experiences that can support learning, because the lesson material is organized around the life side. So the approach used is a kind of social life laboratory.
3. Data on social life at all times, from different places and cultures; analysis of social life using various disciplines as well as various purposes and methods of social studies can be used.
4. Students can learn various social lives at various times, places, and cultures, allowing for a wide experience.
5. With this form of curriculum, it is possible to create a social process as desired.

The following is example of the life-formula form that is organized around life processes as designed by Virginia State Board of Education 1934:

The curriculum programs designed are:

1. Protecting life and health
2. Getting a living
3. Making a home
4. Expressing religious impulses
5. Satisfying the desire for beauty
6. Securing education
7. Cooperating in social and civic action
8. Engaging in reaction
9. Improving material condition. (Taba, 1962, p. 198).

Many forms of curriculum design that comes from a life that has been made. Stratemeyer, Forkner, and McKim formulate the scope and sequence of materials in greater detail. The formulation combines the concepts of general activity, the needs and life situations on the basis of environment awareness in the curriculum design. The sequence of activities is based on the geographical environment, ranging from family circles, communities, nations and the world. It is also made in sequence based on the level of understanding, from the understanding of the experience that immediately came to the widespread sense. Thus, all topics and sub-topics are fed menace to the base.

The difficulties faced in developing this curriculum deal with the followings:

1. In the implementation, the relationship between the curriculum content and the desired function of life is lightly achieved.
2. Developing a curriculum with a life-based scheme is harder than organizing subject-based subject matter.
3. There is often a failure to integrate the learning experiences according to the main purpose of the life curriculum.

Experience Base Curriculum

The activity-based curriculum is also known the experience-based curriculum. This type of curriculum seeks to overcome the various weaknesses contained in the subject curriculum. In the subject curriculum, the students' activities receive more lessons. Therefore, it is recommended to emphasize the activity of the students.

In addition, the subject curriculum content or learning materials is the result of past experience. It does not pay attention to real experiences of students . Therefore, to overcome this weakness, it is recommended that the curriculum is prepared based on students' experience.

Rational use of this curriculum are:

1. Learning occurs with experienced processes. Only learning that relates to activities and experiences can lead to changes in behavior. Students can learn well if they are faced with actual problems, so they can find their real needs or interests.
2. Learning is an active transaction. To learn and to think logically, a person does not only use logical argument, or master a logically arranged material, but also do several meaningful activities.
3. Active learning requires visual activities in order to achieve goals and meet personal needs.
4. Learning occurs through the process of overcoming obstacles (problems) to reach the objective.
5. It is only through the classification of problems that enable the activation of motivation so that the students are experienced with purposeful activities.

One of the essential features of the activity curriculum is that students are encouraged to use the method of problem solving and to set up their tasks dealing with skills and knowledge gained as they needed. All subjects are used according to the need for task

completion. Therefore, the curriculum is aesthetically focused on the interest of tasks: to break the limit of subjects, provide the dynamics of learning and meet the learning objectives with its application in the realization of life.

The curriculum implementation is done by using project method. In this case, the students are given the opportunity to plan and conduct project activities in accordance with their interests and needs. Such as carpentry projects, handwork, sculpt and so on. Killpatrick (1918) divides the following projects:

1. Game projects such as dancing or drama
2. The project such as the work of the tour to the places of history, biological gardens or the like
3. Project stories read and listen to stories.
4. Handwork projects are like making a workshop.

According to Hilda Taba, this kind of curriculum is suitable especially for elementary school, even because it is based on reality.

According to Nasution, the development of this curriculum further direct experience and spontaneous interest as an aid in the process of learning, not as a point to set up the unit. Therefore, the students' interest is more like a study experience or research experience.

Core Curriculum

The core form of the curriculum aims to develop integration, serve students' boredom and enhance learning activeness and the relationship between life and learning. The term core is often used in different contexts. Harold Alberty (1953) in Designing Programs to Meet the Common Need of Youth, described six program designs as cores, namely:

1. Core consisting of a number of subjects each can be taught freely. Taught without a certain system to show the relationship between each of the lessons.
2. The core consists of a number of lessons that are linked to each other.
3. A core consisting of widespread problems, work units or unified themes that are sought as to produce the meaning of teaching the content of certain subjects effectively. The lesson still reflect characteristic of the subect, but its contents are selected and taught to refer to units, problems or themes. Examples, themes in society, taught in the subjects of social studies, science and so on.
4. Core consisting of a number of subjects that merged
5. A core consisting of widespread problems that can meet the needs of the psychological and social problem and interests of students.
6. A core consisting of a large work unit or activity that teachers and students plan together to fit the needs of the group. There is no basic curriculum structure in this program.

From Alberty's example, we can say that number 1 shows the core in the sense of general education. While the numbers 4 to 6 describe the meaning of cores that are similar to the integrated curriculum. Thus, it can be said that core curriculum is not a curriculum, but a way of implementing the curriculum.

Teaching and Learning Processes

The learning process is conducted in order to give students an opportunity to gain learning experience. The learning process can be developed to increase the emotional and spiritual dimensions using simple methods and practices, such as interactive discussion, avoiding verbal abuse towards students, solving problems with a

win-win solution, developing tolerance (learning to accept people as they are) and many other ways. All of them can be grasped through the learning process of all subjects. Teachers would not be too tired of making one-way speech through the entire lesson. There are some teachers who still think they are the single source of the learning process. In the student-centered learning concept, teachers function as facilitators, motivators, and models.

The teaching and learning process is held depending on the type of curriculum used. The curricula of the subject matter differ from those centered on the experience or function of life. In the subject-based curriculum, the learning process is carried out around students' mastery of the subject matter. The process can be diverse, ranging from simple lectures to complex ones, such as the discovery methods.

Educational technology used in the teaching and learning processes emerges as a result of the development of the concept of teaching and learning. It is a kind of systematic approach to planning, executing and evaluating the teaching and learning processes.

It is also known in daily practice as the device used in teaching and learning process, i.e. software and hardware. Teaching with software is conducted in the form of learning programs in which the students learn individually. This program essentially contains the objectives to be achieved, the lesson material learned, the activities that must be done to prepare the strengthening of material mastery, and the assessment used. All these components are integrated into one program in the form of small units. Thus, each student is expected to master the material thoroughly. These forms of teaching and learning processe can be seen in programmed instruction or modular instruction.

Meanwhile, the use of hardware in teaching can generally be intended with all the tools used in teaching. In the context of educational technology, hardware is intended as a tool that

can help students learn individually. Thus the principle of use or implementation is the same as the use of software. These forms of teaching can be identified from the use of a teaching machine or a computer assisted instruction.

The application of the concept of educational technology can use either one device or both. One of the most important things is that the application of educational technology aims to streamline the teaching and learning process.

The implementation of the curriculum is oriented to activities or experiences different from those described above. In this curriculum, the learning process emphasizes the use of projection methods. Where students are given the opportunity to implement projects under guidance. It can also be a project done around the problem which is the subject of the unit. It can also be a unit item taken from the source unit in which the students doing activities around that unit. These activities include implementing projects, studying subjects around the unit and experiences related to the life of the unit.

It turns out that unit teaching is not only suitable for the experienced curriculum, but also for a life-centered curriculum. Likewise, core curriculum can take or utilize unit teaching for integrated core form. While the core of general education can be carried out teaching as to the implementation of the subject curriculum.

The affective learning is different from that of intellectual and skill learning due to its subjectivity, flexibility, and there is no special material that has to be learned. However, it does not necessarily mean that it cannot be integrated into the education curricula. Thus, affective learning requires teaching method and learning evaluation which are different from cognitive and skill learning.

Chapter 8

Curriculum Evaluation

The term evaluation is used to designate summing-up process in which value judgement play a large part (Stanley and Hopkins, 1978). Curriculum evaluation is conducted not only on a single curriculum component, rather, it should be conducted to all components covering objectives, contents, organization and the evaluating itself. It needs to be conducted comprehensively. It is because the curriculum itself is a unity consisting of various components that are related to each other.

Evaluation also refers to an attempt to toss light on two questions, such as, do planned courses, programs, activities, and learning opportunities as developed and organized actually produce desired results? How can the offered curriculum be improved? It also refers to the intrinsic value of an entity, value that is implicit, inherent, and independent of any applications (Guba and Lincoln, 1981). The value of an entity in reference to a particular context or a specific application. It is the "payoff" value for a given institution or group of people. curriculum evaluation should be concerned with assessing both merit and worth of a curriculum.

Principles of Curriculum Evaluation

Curriculum evaluation is conducted to all components covering objectives, contents, organization, and evaluation. Evaluating the

objectives deals with their feasibility and attainability. This must be carried out since the formulation of goals into objectives has to rely on a strong foundation. It is questionable whether objective formulation uses solid foundation. The goal is also a hope and desire, so it is necessary to relate to underlying philosophy as its basis, whether the desire comes from the community or the expectation of the curriculum designer, or whether that hope is achievable or not. In addition, we need to identify what obstacles expected to arise in the process of achieving that goal. There are still more other questions to be addressed in the curriculum evaluation.

In a systematic approach to curriculum evaluation, the curricular goal guides the other curriculum components. For example, the selection of learning experience to help students acquire curriculum content will be based upon the the alignment between materials & objective, and the materials with psychological bases, both are related to learning and individual development. Materials that are inconsistent with objectives can not be expected to provide meaningful learning experiences. Similarly, inconsistency with psychological principles will cause non-optimal behavior change.

The learning process depends on the organizational form of the curriculum used. In this context, it will guide the concept of education, whether the education only serves to inherit and transform culture or to develop an individual. This will affect the form of education in achieving the goal. In this case, the evaluation is conducted with the intention to know how far the process can provide him or her with optimal behavioral changes

In evaluating the curriculum, we need to determine the procedures, techniques and materials. These three components can affect the evaluation in terms of validity, reliability, significance and objectivity. Besides that, evaluation is not only directed to evaluate students' and school's performances but also address the relevancy between curriular goals and the graduate users' expectation.

The main objective of the evaluation is to know how the students achieve the intended goals. That is why the goals become the basis for other curriculum components covering content, organization, and evaluation. What students learn should be in line with the goals reflected in the curriculum content. So, the breadth and depth of the curriculum contents depend on the purpose of the curriculum. Thus, if we want to know whether the goal is achieved entirely, the materials can become the basis of evaluation.

Implementation of evaluation is sometimes influenced by teachers' subjectivity. If this happens, then the evaluation results cannot describe the actual situation of the curriculum implementation. Thus, the evaluation needs to be conducted objectively in order to reveal the real condition.

Based on the above explanation, in conducting curriculum evaluation, it is necessary to follow the following principles:

1. Evaluation refers to the goals
2. Evaluation is comprehensive
3. Evaluation is done objectively

Goals as the basis for evaluation

In order that the evaluation is relevant, it should be clearer from the beginning the basis used for formulating objectives. The purpose of this reference should be formulated first so that it clearly illustrates what is to be achieved. When the goal formulation is set by using Bloom Taxonomy, this can be used as a reference to identify the levels of students' attainment of knowledge. skills, attitudes as the result of their learning processes. To set the measuring tool for assessing this attinment will require a detailed description of the three aspects of learning on the basis of that taxonomy. In particular field of knowledge, a study can be conducted to determine the forms of goals relevant to the taxonomy. In this concern, an in-depth

study of the cognitive, affective and psychomotor domains needs to be conducted.

Another principle of the use of goals as the basis of evaluation is that their formulation should be able to describe the form of measurable behavior. Therefore, it is obvious that the specific description of the goals is needed. By doing an evaluation of the sepecific description, the entire results of goals achievement can be mapped. If it is possible, the number of items of evaluation needs to be considered carefully.

The main focus in determining the target in the evaluation is affected by by the curriculum model. Therefore, different models of curricula like subject-centered curriculum and the activity or life-based is curriculum require different models of curruculum evaluation.

All Learning Materials Should Be Included in Evaluation

The width and depth of the materials are tailored to the curriculuar goals. If the goal determines the extentsive materials, the result will be a lot of materials that must be assessed in order to determine goal achievement. Could this be done? There may be two possibilities, we must first evaluate the items as much as possible in accordance with quantitative goals or materials. Of course, this will take a long time. Secondly, the samples can be taken for a certain purpose so that the gains are not too much and can be done in relatively short time.

If we use the sample as a basis for conducting a comprehensive evaluation, it takes a certain technique. The technique can be done by first making the evaluation blueprint. Based on the blueprint, an evaluation tool can be made.

Evaluation Should Be Objective

The main purpose of the curriculum implementation is as a basis to provide feedback. Therefore, evaluation should be done continuously. Because the purpose of the evaluation is not just to determine the index of ability or give grades to students.

The results of the evaluation should be able to describe the real conditions. By knowing the actual results, the evaluator knows the weakness and strengths of the curriculum and the ability of students as well. In order to make the evaluation results meaningful, objectivity needs to be taken into account.

This objectivity means that evaluation needs to be done without any 'interventions' or disturbances from teacher or students. The evaluation which is not based upon objectivity can not provide reliable data for the improvement of the curriculum.

All in all, based on the three principles discussed, curriculum implementation is considered as a big activity in the development of curriculum. In order that the data obtained can be used as the basis for feedback for revising curriculum, the tools used in the evaluation must meet the following criteria:

1. The evaluation tool should be in accordance with the target to be addressed
2. The tool used must be valid
3. Used tools must be reliable
4. The evaluation tool should be significant

The four criteria above can be achieved if the tool used is standardized.

Models of Curriculum Evaluation

The merits and worths of the curriculum can be determined through curriculum evaluation. In its application, there are seven models of the curriculum evaluation, namely: Bradley's Effectiveness Model, Tyler's Objectives-Centered Model, Stufflebeam's Context, Input, Process, Product Model; Scriven's Goal-Free Model, Stake's Responsive Model, Eisner's Connoisseurship Model, and Eisner's Connoisseurship Model.

Bradley Model

Bradley's model is also called as an effective model. This evaluation model deals with assessing a developed curriculum. In the assessment, there are 10 key indicators that can be used to measure the effectiveness of a developed curriculum.

1. Vertical curriculum continuity. There is a continuity of the course of study from the previous grades (low grader) through the following ones (high grader). Also, upward spiraling prevents undue or useless curricular repetition.
2. Horizontal curriculum continuity. The course of study developed provides content and objectives that are common to all classrooms of the same grade level. Also, daily lesson plans reflect a commonality for the same grade level.
3. Instruction based on the curriculum. Lesson plans are derived from the course of study, and curriculum materials used are correlated with the content, objectives, and authentic tasks developed.
4. Curriculum priority. Philosophical and financial commitments are evident. Clerical assistance is provided and reasonable stipends are paid to teachers for work during the summer months. In addition, curriculum topics appear on school board agendas, administrative meeting agendas, and building-staff meeting agendas.

5. Broad involvement. Buildings in the district have teacher representatives on the curricular committees; elementary, middle level or junior high, and high school principals (or designees) are represented; and school board members are apprised of and approve the course of study.
6. Long-range planning. Each program in the district is included in the 5-year sequence and review cycle. Also, a philosophy of education and theory of curriculum permeate the entire school district.
7. Decision-making clarity. Controversies that occur during the development of a program center on the nature of the decision, and not on who makes the decision.
8. Positive human relations. Also, the initial thoughts about the curriculum come from teachers, principals, and the curriculum leader. All participating members are willing to risk disagreeing with anyone else; however, communication lines are not allowed to break down.
9. The district philosophy, vision, mission, exit (graduation) outcomes, program philosophy, rationale statement, program goals, program objectives, learning outcomes, and authentic tasks are consistent and recognizable.
10. Tangible evidence shows that the internal and external publics accept the developed program course of study for the school district. The process of developing a course of study for each program or discipline in a school district is no longer one of determining how to do it, but one of determining how to do it better.

    The above indicators and their descriptors are used to evaluate curriculum. (Adapted from Bradley, 1985, pp. 141–146).

The indicators represent working characteristics that any complex organization must have in order to be responsive and responsible to

its clients. Further, the measurement can be oriented to meet the needs of any school district from large to small and it can focus on a specific evaluation of a district's curriculum area, such as reading, language arts, math, or any content area designated. The models developed by Tyler, Stufflebeam, Scriven, Stake, and Eisner, as are going to be presented below give some support to this model.

Tyler Model

One of the earliest curriculum evaluation models, which continues to influence many assessment projects, was that proposed by Tyler (1950), which is an objective centered. Tyler approach moved rationally and systematically through several related steps, which begin with the behavioral objectives that have been previously determined. Those objectives should specify both the content of learning and the expected student behavior, demonstrate familiarity with dependable sources of information on questions relating to nutrition, and identify the situations that will give the student the opportunity to express the behavior embodied in the objective and that evoke or encourage this behavior.

The model has several advantages, namely: 1) It is relatively easy to understand and apply. 2) It is rational and systematic. 3) It focuses on curricular strengths and weaknesses, rather than being concerned solely with the performance of individual students. 4) It emphasizes the importance of a continuing cycle of assessment, analysis, and improvement. As Guba and Lincoln (1981) pointed out, however, it suffers from several deficiencies, i.e., it does not suggest how the objectives themselves should be evaluated, does not provide standards or suggest how standards should be developed, its emphasis on the prior statement of objectives may restrict creativity in curriculum development, and it seems to place undue emphasis on the pre-assessment and post-assessment, ignoring completely the need for formative assessment.

Stufflebeam Model

The obvious weaknesses in the Tyler model led several evaluation experts to critique the Tyler model and to offer alternatives. The alternative that had the greatest impact was that developed by a Phi Delta Kappa committee chaired by Daniel Stufflebeam (1971). This model seemed to appeal to educational leaders because it emphasized the importance of producing evaluative data for decision making. The model provides a means for generating data relating to four stages of program operation, namely context, input, process, product.

Context evaluation continuously assesses needs and problems in the context to help decision makers determine goals and objectives; input evaluation assesses alternative means for achieving those goals to help decision makers choose optimal means; process evaluation monitors the processes both to ensure that the means are actually being implemented and to make the necessary modifications; and product evaluation compares actual ends with intended ends and leads to a series of recycling decisions.

The context, input, process, product (CIPP) model, as it has come to be called, has several attractive features for those interested in curriculum evaluation. Its emphasis on decision making seems appropriate for administrators concerned with improving curricula. Its concern for the formative aspects of evaluation remedies a serious deficiency in the Tyler model. Finally, the detailed guidelines and forms created by the committee provide step-by-step guidance for users.

The CIPP model, however, has some serious drawbacks associated with it. Its main weakness seems to be its failure to recognize the complexity of the decision-making process in organizations. It assumes more rationality than exists in such situations and ignores the political factors that play a large part in these decisions. Also, as Guba and Lincoln (1981) noted, it seems difficult to implement and expensive to maintain.

Scriven Model

This model is welknown as a Goal-Free Model and is developed by Michael Scriven (1972). It is called as a goal free model since the model developer questions the assumption that goals or objectives are crucial in the evaluation process. He questions the seemingly arbitrary distinction between intended and unintended effects. His goal-free model was the outcome of this dissatisfaction.

In conducting a goal-free evaluation, the evaluator functions as an unbiased observer who begins by generating a profile of needs for the group served by a given program. Scriven is somewhat vague as to how this needs profile is to be derived Then, by using methods that are primarily qualitative in nature, the evaluator assesses the actual effects of the program. If a program has an effect that is responsive to one of the identified needs, then the program is perceived as useful.

Scriven's main contribution, obviously, was to redirect the attention of evaluators and administrators to the importance of unintended effects—a redirection that seems especially useful in education. If a mathematics program achieves its objectives of improving computational skills but has the unintended effect of diminishing interest in mathematics, then it cannot be judged completely successful. Scriven's emphasis on qualitative methods also seemed to come at an opportune moment, when there was increasing dissatisfaction in the research community with the dominance of quantitative methodologies.

As Scriven himself notes, however, goal-free evaluation should be used to complement, not supplant, goal-based assessments.When the model is used alone, it cannot provide sufficient information for the decision maker. Some critics have faulted Scriven for not providing more explicit directions for developing and implementing the goal-free model; as a consequence, it probably can be used only by experts who do not require explicit guidance in assessing needs and detecting effects.

Stake Model

Robert Stake (1975) made a major contribution to curriculum evaluation in his development of the responsive model because the responsive model is based explicitly on the assumption that the stakeholders are main concern in the evaluation. The evaluation issues must be determined in advance. To emphasize evaluation issues that are important for each particular program, he recommends the responsive evaluation approach. It is an approach that trades off some measurement precision in order to increase the usefulness of the findings to persons in and around the program.

An educational evaluation is a responsive evaluation if it orients more directly to program activities than to program intents. It responds to audience requirements for information if the different value perspectives are referred to in reporting the success and failure of the program. Stake recommends an interactive and recursive evaluation process that embodies the steps, namely the evaluator meets with clients, staff, and audiences to gain a sense of their perspectives on and intentions regarding the evaluation; the evaluator draws on such discussions and the analysis of any documents to determine the scope of the evaluation project; the evaluator observes the program closely to get a sense of its operation and to note any unintended deviations from announced intents; the evaluator discovers the stated and real purposes of the project and the concerns that various audiences have about it and the evaluation; and the evaluator identifies the issues and problems with which the evaluation should be concerned.

For each issue and problem, the evaluator develops an evaluation design, specifying the kinds of data needed. The evaluator selects the means needed to acquire the data desired. Most often, the means will be human observers or judges. The evaluator implements the data-collection procedures. The evaluator organizes the information into themes and prepares "portrayals" that communicate in natural ways the thematic reports. The portrayals may involve videotapes, artifacts, case studies, or other "faithful representations."

The chief advantage of the responsive model is its sensitivity to clients. By identifying their concerns and being sensitive to their values, by involving them closely throughout the evaluation, and by adapting the form of reports to meet their needs, the model, if effectively used, should result in evaluations of high utility to clients. The responsive model also has the virtue of flexibility. It means the evaluator is able to choose from a variety of methodologies once client concerns have been identified. Its chief weakness would seem to be its susceptibility to manipulation by clients, who in expressing their concerns might attempt to draw attention away from weaknesses they did not want to be exposed.

Eisner Model

This model is proposed by Elliot Eisner (1979) based on his background in aesthetics and art education in developing his "connoisseurship" model, an approach to evaluation that emphasizes qualitative appreciation. The model is built on two closely related constructs, i.e., connoisseurship and criticism. Connoisseurship is the art of appreciation recognizing and appreciating through perceptual memory, drawing from experience to appreciate what is significant. It is the ability both to perceive the particulars of educational life and to understand how those particulars form part of a classroom structure.

Critique of this model is the art of disclosing qualities of an entity that connoisseurship perceives. In such a disclosure, the educational critic is more likely to use what Eisner calls "non-discursive" a language that is metaphorical, connotative, and symbolic. It uses linguistic forms to present, rather than represent, conception or feeling. Educational criticism, in Eisner's formulation, has three aspects.

The descriptive aspect is an attempt to characterize and portray the relevant qualities of educational life, the rules, the regularities,

and the underlying architecture. The interpretive aspect uses ideas from the social sciences to explore meanings and develop alternative explanations to explicate social phenomena. The evaluative aspect makes judgments to improve the educational processes and provides grounds for the value choices made so that others might better disagree.

The chief contribution of the Eisner model is that it breaks sharply with the traditional scientific models and offers a radically different view of what evaluation might be. In doing so, it broadens the evaluator's perspective and enriches his or her repertoire by drawing from a rich tradition of artistic criticism. Its critics have faulted it for its lack of methodological rigor, although Eisner has attempted to refute such charges. Critics have also argued that use of the model requires a great deal of expertise, noting the seeming elitism implied in the term connoisseurship.

Curriculum Evaluation Forms

Based on its implementation and objective, the curriculum evaluation can be divided into two forms, namely:

1. *Formative evaluation*. This kind of evaluation is carried out during the curriculum implementation for the purpose of improvement. This evaluation can be carried out on the implementation of the program or individual subjects from a curriculum or to the overall implementation of the curriculum.
2. *Summative evaluation*. This evaluation is done at the end of the curriculum implementation. For example, the evaluation of the elementary school curriculum is conducted after the completion of 6 years with the aim to know the successful implementation of the curriculum.

The users of formative evaluation results are different from users of summative evaluation results. When viewed from the goal,

formative evaluation is conducted to make improvements. Therefore, the user of the formative evaluation result is a curriculum developer. Meanwhile, summative evaluation users are schools that implement the curriculum itself, supervisors, teachers, students, parents, and other stakeholders. Formative evaluation is very important to conduct because it can be used as the basis whether the curriculum can be implemented or needs to be replaced.

In practice, it is often difficult to distinguish whether an evaluation is formative or summative. This is because both forms of evaluation can be implemented simultaneously. What makes them different is the purpose of the evaluation. If the purpose of the evaluation is on the basis of improvement, then the evaluation includes formative. If the goal is to know its success, then the evaluation is summative. Thus, basically the form of evaluation is equally important, although in reality sometimes only summative evaluations are carried out. This is generally caused by the lack of attention of developers and implementers of the curriculum against the interests of the evaluation itself.

Techniques of Evaluation

The implementation of curriculum evaluation can use the techniques of:

1. Non-test. Non-test techniques generally use the tools such as:
    a. Interview. This interview technique is carried out by conducting a question and answer, either directly or indirectly. The tool used is the interview guidelines which, of course, refer to established goals.
    b. Questionnaire. This questionnaire is a written interview. The principle of using and compiling this tool is the same as the interview.

c. Observation. It is conducted by observing the activities both directly and indirectly. The tool used is observation guideline that in the form of checklist or rating scale.

d. Check list. It consists of a number of items used to make an assessment by putting a check on the tool according to the circumstances assessed.

e. Rating scale. Graded items are scaled down on a certain scale. Every activity is judged based on the scale.

2. Test. This technique is usually used to assess the results of curriculum in the form of student learning outcomes. The test can be done in three ways, namely oral, written and performance. The oral test is done verbally because it mainly aims to assess:

   a. Problem-solving skills

   b. The process of thinking dealing with causal relationship

   c. Using spoken Languages

   d. Ability to account for opinions or concepts

   The performance test is a test carried out using action. This serves as a psychomotor judgment. It mainly assesses the ability of:

   a. Manipulative (the ability to use tools)

   b. Manual (the ability to perform acts based on instructions)

   c. Non-verbal (the ability to express something non-verbally)

   d. Self-awareness.

The written test is done in writing both the question and the answer. This technique has a very wide use. The forms of test questions that can be used are the essay and objective test.

The implementation of the test can be conducted by utilizing the instrument in the form of standardized test or teacher-made test. References that can be used is in the form of norm-reference

and criterion-reference. Guidance and skills are needed to conduct a proper curriculum evaluation. This is important so it can provide feedback related to the real implementation of the curriculum.

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Professor, Universitas Pendidikan Indonesia (Indonesia University of Education), Bandung, Indonesia. He earned a Doctorate degree (Doctor of Philosophy) in Development Communication Science from Bogor Institute of Agriculture, earned the second master's degree (Master of Arts) in Research Methodology from University of Pittsburgh, USA; earned the first master's degree (Master of Education) and Bachelor degree (*Sarjana*) in Educational Sciences from Bandung Institute of Education (the former name of Universitas Pendidikan Indonesia). He also has undertaken several short courses inside and outside the country.

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Aside from his academic position as Professor, since 2016 he has been serving as the Key Person coordinating ProSPER.Net (Promotion of Sustainability in Postgraduate Education and Research Network) at Universitas Pendidikan Indonesia. He had also been appointed by the President, Republic of Indonesia, to serve as The Director-General of Islamic Education, Ministry of Religious Affairs (2007-2012). Prior to the appointment in this position, he had been serving as the Dean of the Faculty of Educational Sciences (2004-2007), had been serving as the Chairman of the Research Institute (2000-2004), and had been serving as the Coordinator of Micro-teaching Laboratory (1993-1996) at the University of which he has been the faculty member.