

The Role of Open Distance Learning in Environmental Improvement

Warlina, Lina

Universitas Terbuka, (warlina@ut.ac.id)

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Abstract

Nowadays, environmental degradation is very worrying, especially in Indonesia. Many causes of environmental degradation, one of which is lack of education about the environment. This article will discuss about the use of instructional media that can be used as socialization or learning about the environment at various levels, from elementary school, secondary schools, colleges and general public. Open Distance Learning (ODL) system with its characteristics can be an alternative to learning about the environment. In addition, the system of ODL used a variety of media, print and non-print, the presentation can be done in the form of audio cassettes, videotapes or compact discs (CD). With the selection of media tailored to the level of understanding, then the delivery of materials on the environment is expected to be more interesting and easily understood. It is expected that all the levels starting from the basic to the general public become more concerned about the environment, and will indirectly impact on environmental improvement.

Keywords: environmental degradation, ODL system, instructional media

INTRODUCTION

Environmental damage caused by human activity has been happened since the 1950's. At that time the population around the bay and river Jintsu Minimata, Japan, suffered diseases caused by toxic heavy metals such as Hg and Cd, which is waste from industries located in the region. The impact of these toxins has claimed many lives of residents in the area (Soemarwoto, 2003).

In the 1960's in America published a book entitled 'The Silent Spring' which describes the extinction of animals from use of insecticides in the United States. Meanwhile in developing countries such as vomiting, diarrhea diseases arise, due to poor sanitation and water pollution. Besides, in the African countries an expansion of deserts or desertifications are happened. Both in developed and developing countries there is damage to the environment that affects human life. Under these conditions, the UN environmental conference in Stockholm in 1972. Since then environmental problems has become an international problem.

But the environment is not getting better, even with the onset of increased damaged some new damage such as acid rain, ozone layer depletion, and rising global temperatures caused by fossil fuel use in excess (Soemarwoto, 1992). This

problem of environmental damage, caused by increasing human needs for energy in carrying out development.

Industrial countries have long produced Greenhouse Gas (GHG) emissions that accumulate in the atmosphere in large quantities. Therefore, it is reasonable if they are obliged to reduce GHG emissions and address climate change impacts. Meanwhile, developing countries are not obliged to reduce its GHG emissions are entitled to assistance from industrialized countries to participate voluntarily in order to reduce GHG emissions and address climate change impacts.

It is recognized that the role of humans is so large in determining the conditions and environmental quality. If the active role of humans in fact do not care about the preservation of environmental quality and function, it will be corrupted environment and vice versa. The floods and landslides or forest fires also damage and no-control from year to year is an example result of the role of human development that is not environmentally sound.

Environmental issues is a moral issue. Environmental management education needs to be invested to children from an early age. Children are more easily internalize the values and habits of preserving the environment than adults. Thus, the expected future environmental destruction can be prevented through environmental awareness for future generations.

In the implementation of environmental education, in Indonesia, the problems encountered various situations are: the low participation of the community to participate in the educational environment caused by a lack of understanding of existing environmental problems of education, low levels of ability or skill and low commitment to the community in solving these problems. In addition, understanding the education of environmental education is still limited also a constraint. It can be seen from the perception of the perpetrators of environmental education is highly variable (KLH, 2006). Lack of commitment to the success of education also affect the development of environmental education. In formal education, there is still a school policy which assumes that environmental education is not so important as to limit the space and creativity of educators to teach environmental education in a comprehensive manner. Another thing to be a limiting factor is the lack of availability of environmental education budget. The lack of attention the Government to allocate and increase the budget for environmental education also affect the development of environmental education.

To save the environment so that future generations can enjoy a clean environment, it is necessary to sensitize all levels of society by providing information about the environment or socialization correctly. Socialization can be given starting from the primary level, secondary level, college or society. Open learning and distance with their characteristics, can be an alternative to learning about the environment.

This paper aims to outline the role of distance education in enhancing learning about the environment, especially at the Universitas Terbuka (UT). Hopefully with increased awareness about the environment, it will indirectly have an impact on environmental improvement.

Environmental damage and pollution

Based on the causes, the environmental damage can be divided into two types, there are natural events and human-induced. Examples of environmental damage caused by natural events is a tsunami, volcanic eruption, earthquake, and hurricanes. While environmental damage is prevalent today is the environmental damage due to human factors.

Humans plays a major role in determining the sustainability of the environment. Human beings as creatures of God who understands the world could change the face of a pattern of simple life forms to modern life what it is today. Unfortunately, often what people do not offset by thinking about the future life of the next generation. Many of the advances achieved by humans bring adverse impacts on environmental sustainability. Some forms of environmental degradation due to human factors, there are:

- a. Pollution (pollution of air, water, soil, and voice) as the impact of the industrial park.
- b. Flooding, as the impact of poor drainage or sewerage system and errors in keeping the watershed and the impacts of forest destruction.
- c. The occurrence of landslides, as the direct impact of forest destruction.

Some human activities that either directly or indirectly impact on environmental degradation, some examples are:

- a. Illegal logging (deforestation).
- b. Poaching.
- c. Mangrove forest destruction.
- d. Hoarding swamps to the settlement.
- e. Disposal of waste in any place.
- f. Illegal buildings in the watershed
- g. Utilization of natural resources beyond excessive

Efforts Environmental Protection and Sustainable Development

Preserving the environment is a necessity that can not be postponed again and not only the responsibility of government or heads of state only, but the responsibility of every human being on earth, from toddlers to seniors. Everyone should make an effort to save the environment around us in accordance with their respective capacities. Even the slightest effort we are doing is very beneficial for the realization of the earth habitable for future generations of our grandchildren.

Government efforts to achieve equitable and prosperous life for its people without causing environmental damage should be followed up by establishing sustainable development programs are often referred to as the environmentally sound development. Environmentally sound development is the effort to improve the quality of human gradually by looking at environmental factors. .

Environmentally development known as sustainable development. The concept of sustainable development is an agreement of the Earth Summit in Rio de Jeniro 1992. It contains two important ideas, namely:

- a. The idea of the needs, especially basic human needs to sustain life.
- b. The idea of limitations, the limited ability of the environment to meet the needs of both the present and the future.

World's concern about the environmental

Effort to preserve the world environment has long been done. According Sutrisno (2005, in Setiawan, 2008), such efforts can be divided into five periods. The period before 1940, there are some agreements made by the international community in the form of, among others, the Convention for Protection of Birds Useful to Agricultural (1902), Regulation of Whaling Convention (1931). The period 1940 to 1972 recorded nearly 60 international treaties that contain several components of environmental issues, such as WHO, UNESCO and FAO. In 1972, the UN held a conference in Stockholm, known as the Stockholm Conference of 1972.

The period after the Stockholm conference, namely 1972-1992, the United Nations established the United National Environment Programme (UNEP) and the Environmental Fund (Environment Fund). In this period carried the conventional handling of environmental problems, such as preservation of rare flora and fauna, air and water pollution, habitat protection, etc.. In this period produced some important conventions such as Vienna Convention for the ozone layer (1985), Biodiversity Convention (1992). In addition, during this period formed the World Commission on Environment and Development (WCED), known also Brudland Commission, which perform an integral approach in responding to environmental problems and developed into the concept of Sustainable Development. Its report entitled Our Common Future which is used as the basis of preparation conference Rio de Janeiro in Brazil.

In the period 1992-2002 occurred advances in the form of increasing awareness of the countries in the world about the importance of sustainable development. In 1992 the ongoing United Nations Conference on Environment and Development (United Nations Conference on Environment and Development/UNCED) which produced the Rio Declaration (Rio Declaration) and Agenda 21. In this period formed the Commission on Sustainable Development (Commission on Sustainable Development/CSD). A number of conventions generated in this period include the Rotterdam Convention on trade in hazardous chemicals and pesticides (1998) Kyoto Protocol on Climate Change (1998), which contains the implementation of the Cartagena Protocol to the UN Convention on Biodiversity and others.

Period 2002 until now, there has been implemented Summit on Sustainable Development held in Johannesburg South Africa in 2002. The summit is actually a follow up of the Rio Declaration and Agenda 21 resulting in the Rio conference and outlined the agenda of the Plan of Implementation 21 action-oriented and measurable.

Struggle through education

The international community is not only trying to protect the environment through various conventions that it generates but also through environmental education. As simultaneously, UNEP, UNESCO and IEEF (International Environmental Education Programme) held several meetings to discuss issues of environmental education in Paris in 1974, Balgrade in 1975, Tblisi in 1987 and so

on. One result of that meeting was formulated definition of Environmental Education as follows:

Environmental Education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among men, his culture and his biological surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behavior about issues concerning environmental quality (UNESCO, 1983).

The definition provides a clear direction that environmental education is not just to provide knowledge about the environment but the form of skills and a good attitude towards the environment. All of that requires the recognition of values and concepts about the relationship between humans and the environment.

Efforts to achieve sustainable development through education became clear after execution Summit on Sustainable Development (World Summit on Sustainable Development or WSSD) on September 2002 in Johannesburg South Africa. The meeting discussed among others the implantation of Agenda 21 which includes a plan of action programs in the fields of social, economic and environmental.

Open Distance Learning

Open and distance learning (ODL) is the system which combine the methodology of distance education (DE) with the concept of open learning and flexible learning (Belawati, 2010). The methodology of DE, more recently known as distance learning, has given rise to the principle that education should and can be open to all. Open education, or open learning, is a vision of an educational system accessible to every individual with minimal restrictions. This philosophy stresses the flexibility of the system to eliminate problems caused by barriers of, for example, age, geographical location, time constraints and economic situation (Bates, 1995 in Belawati, 2010).

Thus, the system of open and distance education is the potential not only as the need for independent learning, but also for educational equity efforts in the form of mass education. The existence of this other than the education system to achieve appropriate educational objectives stated in the curriculum, also aimed to increase access to education.

To overcome students' constrains of time, geographical location and study pace, and the need for effective interaction with the teachers, ODL use the media technologies. With its special dependence on technology platforms, DE has seen intensive uses all media technology. According Taylor (2000), there are five evolutionary stages in media technologies as in Table 1.

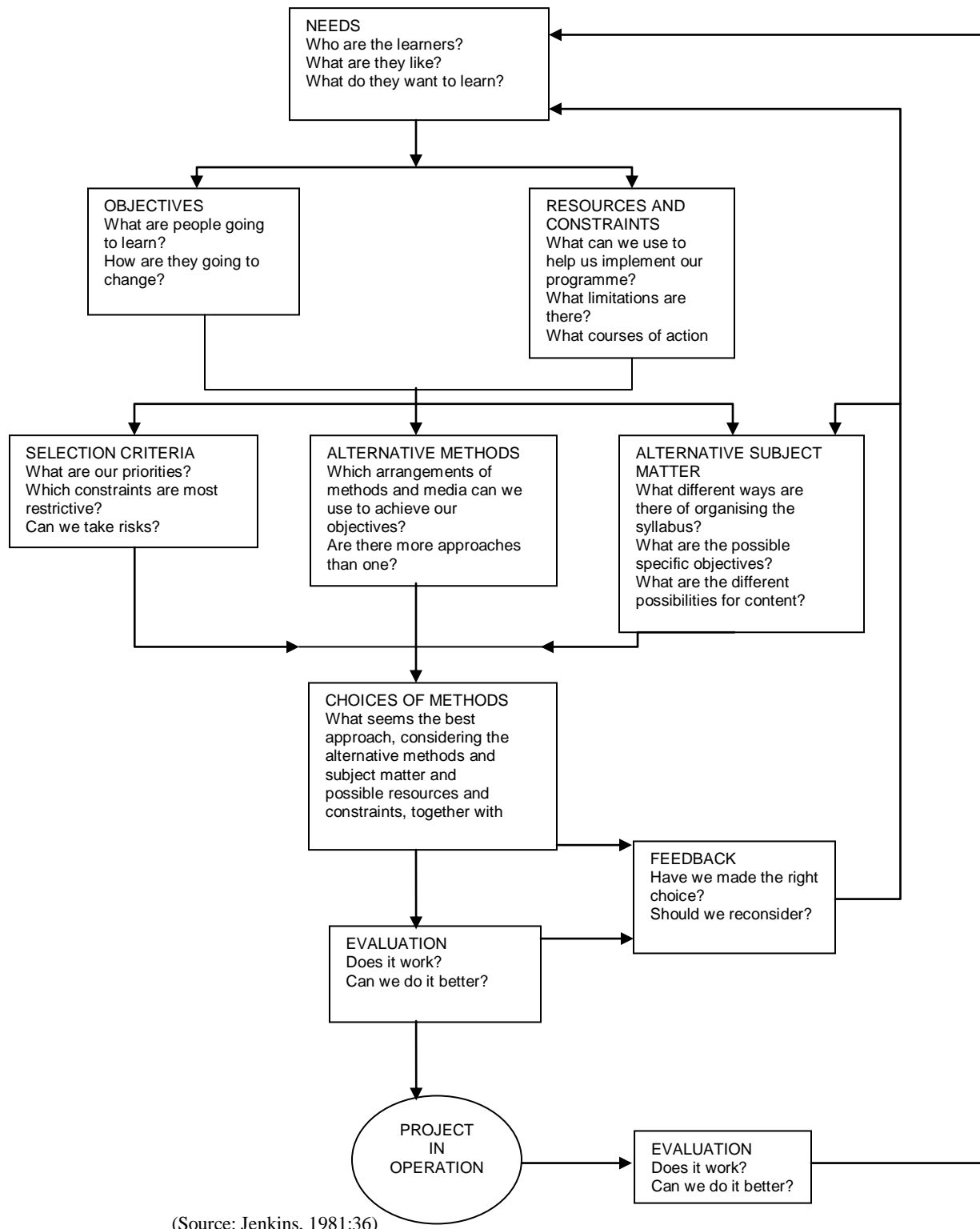
Table 1. The five generations of DE technology (media technologies)

Models of Distance Education and Associated Delivery Technologies	Characteristics of Delivery Technologies				Institutional Variable Costs Approaching Zero
	Flexibility			Advanced Interactive Delivery	
	Time	Place	Pace		
First Generation - The Correspondence Model <ul style="list-style-type: none"> • Print 	Yes	Yes	Yes	No	No
Second Generation - The Multi-media Model <ul style="list-style-type: none"> • Print • Audiotape • Videotape • Computer-based learning (eg CML/CAL) • Interactive video (disk and tape) 	Yes	Yes	Yes	No	No
Third Generation - The Telelearning Model <ul style="list-style-type: none"> • Audioteleconferencing • Videoconferencing • Audiographic Communication • Broadcast TV/Radio and Audioteleconferencing 	No	No	No	Yes	No
Fourth Generation - The Flexible Learning Model <ul style="list-style-type: none"> • Interactive multimedia (IMM) • Internet-based access to WWW resources • Computer mediated communication 	Yes	Yes	Yes	Yes	Yes
Fifth Generation - The Intelligent Flexible Learning Model <ul style="list-style-type: none"> • Interactive multimedia (IMM) • Internet-based access to WWW resources • Computer mediated communication, using automated response systems. 	Yes	Yes	Yes	Yes	Yes

Source: Taylor (2000)

Media choice and combinations

To apply the knowledge that is available about the various media and their characteristics in the practical task of choosing appropriate media and media combinations, a basic model of the planning process within open and distance learning is needed. The following picture (Picture 1) is based on a model proposed by Janet Jenkins (1981) (in [Use and Integration of Media in Open and Distance Learning, 2011](#)).



(Source: Jenkins, 1981:36)

Picture 1. A systems approach for planning open and distance learning

Often, audiences and needs are determined from outside the institution, for example, by governments. This identification tends to be at a very general level, however. Media planners usually require much more detailed information about the characteristics of the audience and its specific educational needs. These require research.

Access to media

There are some key concepts in choosing media is access ([Use and Integration of Media in Open and Distance Learning, 2011](#)):

- that access does your institution have to different media?
- what access do learners have?

Learning objectives need to be developed in terms of:

- what media choices the institution can realistically offer; and
- which media in practical terms learners are in a position to use.

Choosing among alternatives

Designing a media mix involves:

- relating learning objectives and content to the media available;
- originating the design because no scientific formula for a particular design;
- assigning varying quantities of media to different courses, an ability most institutions find always limited; and
- moving rapidly from one medium to another, an ability most learners find imposes limitations.

What tends to happen, is that:

- institutions decide on the 'main medium' of communication; and
- then decide how they can best use 'supporting' media.

In more formal systems:

- the main medium tends to be print; and
- face-to-face and electronic media take a supporting role.

In less formal systems:

- the broadcast of recorded media tends to take the lead;
- face-to-face contact provides focus; and
- print is used as additional support.

The ACTIONS model for selecting media

When selecting media for your open and distance learning programme you can use the simple acronym, ACTIONS, to help you make your decision (Bates 1991, in [Use and Integration of Media in Open and Distance Learning, 2011](#)).

The ACTIONS Model for Selecting Media

A	Accessibility	Is the equipment your programme requires learners? Where will they be learning? At home? In the available to the workplace? At
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		a learning centre?
C	Cost	Are the costs of production, delivery, and maintenance using this technology affordable? Are the costs appropriate to the number of learners who will be enrolled?
T	Teaching ability	Does the technology convey the level of facts, attitudes and skills your programme requires? Is it suited to the kinds of learning required?
I	Interactivity and user-friendliness	Is the technology user-friendly? Can it convey adequate and timely feedback to the learner?
O	Organisation	How open is your organisation to change and the introduction of new media?
N	Novelty	Is it important to your organisation to be 'leading edge'? Is this a technology that learners will want to try?
S	Speed	How fast can your programme implement this technology? How much training do staff and students need in order to be able to use it? Will its use enable you to revise your materials as quickly as you need to?

Implementation of ODL in environmental education

Based on the characteristics of ODL, the alternative media used for education or socialization environments ranging from elementary to the highly variable. In this paper, the specifics will be provided examples of alternative media use ODL at the Open University for the educational environment, especially in Universitas Terbuka (UT), Indonesia.

According to National Education Law (National Education System) No. 20/2003, distance education function is to provide educational services to community groups who cannot follow education or regular face to face. This is very important especially when we are in need of accelerating the process of improving human resources for development, particularly in the development of environmental education.

Elementary school

Environmental education at the elementary school has been neglected because of the limited primary school teachers who have knowledge in the environmental field, it was stated by Director General of Primary and Secondary Education ([Suara Pembaharuan, 2001](#)). Of the approximately 2,382, 326 elementary school teachers, only 20,436 teachers (1.03%) who had received education and training environment. The lack of teachers with environmental education is due to environmental undertaken during of this seems only to the project. The impression arises because environmental education is carried out only in the form of refresher

courses and training among teachers, even environmental education was only discourse.

On the other hand, UT as an institution open and distance education has graduated more than 470 thousand primary school teachers at the Diploma level, and also has graduated elementary school teachers at the Bachelors degree. With the number of primary school teachers are more than 2 million, it is impossible the government to improve the quality of teachers in primary education equivalent to Bachelor through face to face within a relatively short time with relatively low cost, and the teachers do not have to leave his job in teaching. With the accelerating increase in education elementary school teachers, it is expected that application of the learning process at primary school will increase, so the quality of Indonesian children will be increased nationally. Especially with regard to environmental education, primary school teachers are expected to be more intensive in teaching environmental material in elementary school, because there are some subjects in the Faculty of Education curriculum.

UT with its distance education has about 650,000 students. Most of the students (430,000 students) are teachers (66.2%) (Kemendiknas, 2011). To provide an understanding of environment on student in elementary and secondary school can be done through the teacher. In the curriculum, the compulsory subjects, can be added to the teaching environment. Currently, environment related subjects on Faculty of Education is Environmental Education (PS PGSD, PEBI4223), can be used for all courses.

If used a systems approach for planning of open and distance learning as well as the ACTION model approach to selecting the media, the media can be used directly to students in elementary school is the video. Teachers can play video for students in the class. Video can be made as attractive as possible that contains examples of applications from the application of environmental stewardship, for example, video about sewage or video about pollution. Give the example about littering in the river may cause flooding, also can cause abdominal pain because a lot of flies. So, do not litter.

Video are highly accessible because it requires similar production and reception equipment as broadcast media and does not need transmission facilities. Nowadays, UT has already had some video that can given to the elementary school through teachers.

Secondary school

For the secondary school, environmental education can also be entrusted to teachers. As for the elementary school, environmental education can be given through video, but the material is different, more directed to teens. In accordance with its audience, the video can be made more interactive. Teenagers like challengers, give them simulation. For example, the interactive video that UT has already had is "A model on climate change impact on water resources and health (A case study of Jakarta)". It is the simulation video that students can know the impact of climate change to the health.

General Public

Approach to the community has its own way. Based on his audience in a systems approach for planning of open and distance learning models and approaches, ACTION, to the public can use a variety of media, namely print materials (leaflet, fliers), broadcast media, cassette, computer, and face to face instruction. In this case, the government can provide funds for the manufacture of this medium and UT can participate in the dissemination of information.

Access to broadcast media normally depends on the national priority given to a project; □the distribution of the target audience; □the availability of receiving equipment; and the existence of dedicated broadcasting facilities. Meanwhile the advantage of print is that most institutions have access to print; and □at post-literacy levels, most learners are able to use print.

Besides the elementary school teachers, UT also has Workers Education Extension Fields that followed by agricultural extension. Subjects contained in this field of study can actually be attributed to the environmental education. UT has already had many agricultural extensions. Through them, UT can leave environmental messages for the society, especially farmers.

Colleges

As higher education institutions, UT can provide environmental education in various ways, there are:

- Enter the curriculum, environmental education course can be made a separate compulsory subject taken by students
- Leave in basic subjects or basic course, all students participated this basic course, learning about the environment enter into the basic course.
- Create a supplement about environment
- Enter in the tutorial (face to face, tutorial online), give information to the tutors to care about the environment, then the tutors continue the information to the students, or play the video about the environmental at the tutorial.
- Create the environmental program, it can be Bachelor degree or Master degree

Media that can be used in the socialization of the environment can be anything from the first to fifth generation. UT can take advantage of the existing environmental materials .

CONCLUSION

Damage to the environment on earth has been quite worried, especially in Indonesia. However, environmental education to be implemented has several obstacles, including materials and methods of implementation of environmental education are not applicable, the lack of facilities and infrastructure, lack of environmental budget, and weak coordination among related agencies.

Based on explanation above, it can be concluded that the system of ODL, which has been implemented in UT, can be alternative in the process of environmental education. In addition to the curriculum offered by some of the

courses at UT, environmental education can also be distributed by UT through print and non-printing media, technology media from first until fifth generation. It means, ODL system can be used in the dissemination of the environmental education. With its variety of media, ODL can play a role in reducing environmental damage.

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