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## **A NOVEL CONCEPTUAL MODEL OF ENVIRONMENTAL COMMUNAL EDUCATION: Content Analysis Based on Distance Education Approach**

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### **ABSTRACT**

Environmental education as a learning process increases people's knowledge and awareness about the environment. Although in some countries, the Environmental Communal Education (ECE) is the core of the environmental education by formal and informal organizations and groups, but, it has not clarified the meaning of the ECE's concept. Therefore the aim of this study was to scientific clarification of the ECE and to develop conceptual model by using the distance education approach. In this study to concept clarification of the ECE, five-step method of Norris was used. Also, a summative content analysis approach is used to interpret meaning from the content of text data. Findings from the content analysis of ECE plotted as a conceptual model. The results of the content analysis led to the extraction of meaning units, sub-codes and the main themes. According to data explication 6 themes extracted. They were Condition-based, Methods-based, Learner-based, Concern-based, Workgroup-based, and Field-based. On the base of themes and operational definition the Hexa-based model of the ECE developed. According to extracted operational definition and the Hexa-based model of the ECE, the diversity of the target population and educational content, it seems the most appropriate teaching methods, are the distance education methods.

**Keywords:** Environmental communal education, concept clarification, distance education,

### **INTRODUCTION**

Environmental education (EE) refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behavior and ecosystems to live sustainably (Jia-nan, 2012). The EE term is often used to imply education within the school system, from primary to post-secondary (Unesco & Unesco. Division of Education for the Quality of, 1990), however, it sometimes used more broadly to include all efforts to educate the public and other audiences. One of the most accepted definition of EE was given in the Tbilisi Declaration which was developed at the international conference of environmental educators, sponsored by UNESCO in 1977.

There, Environmental education was defined as "a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments make informed decisions and take responsible action (Stevenson, 2007). Following the 1987s, Iranian governmental organizations that focused on environmental education continued to form and grow. The number of governmental and non-governmental organizations focused on environmental education implementing in their activities and the movement gained stronger political backing.

A critical move forward came when the Iran's government passed the Approach to National Development Vision Statement (ANDVS) of 2020, which placed the Workgroup in the Environmental Organization (EO) and allowed the EO to create public environmental education initiatives at the all of the people by using of all governmental and non-governmental resources and agencies.

There is urgency and importance in learning to live in sustainable ways, but environmental education does not hold the priority position in formal schooling that it should (Palmer, 1998). Also, the research findings have showed the significant difference between understanding of EE among students in the curriculum (Shobeiri, Prahallada, & Omidvar, 2007).

Group and individual activities and educational packages are important in multiple presentations in the distance education or learning (FARAJOLLAHI, ZARE, HORMOZI, SARMADI, & ZARIFSANAEE, 2010; Keegan, 1980).

According to ANDVS, Environmental Communal Education (ECE) is the core of the activities, therefore it explained all organizations and groups which are responsible to have coordination to achieve the ECE. But, this statement does not clarify the meaning of the ECE's concept, and also, the instructional design of it. Therefore, the aim of this study was to scientific clarification of the ECE and to develop conceptual model by using the distance education approach.

## **METHODS**

The methods section begins with a brief overview of the methods involved.

### **Norris Method**

In this study to develop the concept of ECE, five-step method of Norris was used (Mehri, Ebadi, Karimooi, Foroughan, & Sahraei, 2012; Rodgers & Knafl, 1999). Norris's method is a concept clarification method (Glasziou, 2003; Lackey, 2000). The first and second steps of the Norris method were provided by a deep narrative literature review of other studies and the use of inductive and deductive logic and rational thinking.

Narrative literature review, often described as "non systematic narrative literature review, are the studies which may help to understand of previous data synthesis and provide information previously published (Torgerson, 2003). In this type of review, the findings of research resources in a compressed format to summarize the content of each of the papers.

Although the critique of literature reviews is not required, but some believe that a review literature should be written for each article as a criticism (Petticrew, Roberts, & MyiLibrary, 2006). Because of the less known methods of literature searching for a narrative review of classified materials, the researcher used a combination of systematic review method and her experience to try to retrieve literature provided a systematic approach.

## **Content Analysis**

Also, in this study a summative content analysis approach is used to interpret meaning from the content of text data (Neuendorf, 2001). Content analysis is "a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Stemler, 2001).

There are two general categories of content analysis: conceptual analysis and relational analysis. Conceptual analysis can be thought of as establishing the existence and frequency of concepts most often represented by words or phrases in a text. In contrast, relational analysis goes one step further by examining the relationships among concepts in a text (Carley, 1993; Weber, 1990). Current applications of content analysis show three distinct approaches: conventional, directed, or summative. All three approaches are used to interpret the meaning of the content of text data and, hence, adhere to the naturalistic paradigm (H. F. Hsieh & S. E. Shannon, 2005).

The major differences among the approaches are coding schemes, origins of codes, and threats to trustworthiness.

In conventional content analysis, coding categories are derived directly from the text data. With a directed approach, analysis starts with a theory or relevant research findings as guidance for initial codes (Zhang & Wildemuth, 2009). A summative content analysis involves counting and comparisons, usually of keywords or content, followed by the interpretation of the underlying context (H.-F. Hsieh & S. E. Shannon, 2005). In order to content analysis, MAXQDA 10 software as qualitative data analysis software, was used for facilitating of organizing the texts, finding the codes, clustering the codes and extract the themes (Kuckartz, 2001).

On based on Norris method, the third step was to provide an operational definition of ECE. Because of the ambiguity of the term, the lack of transparency and lack of differentiation of the concept, it may be difficult for researchers to organize an operational definition) Salsali, Mohammadpur, & Fakhr Movahedi, 2007 (There is more number of literatures which have defined the environmental education, but there is not any operational definition of environmental communal education in literature. Constitute an operational definition is a cognitive process.

Therefore, researcher reviewed the results of the first and second steps of the method and also, frequently using the writing and review of the related phrases, extracted an operational definition.

The fourth stage was the model developing. The model can be defined in many ways. A model may be expressed verbally or through relationships the concepts being presented. Another way is to use signs to express an idea (Creswell & Clark, 2007). Norris believes it makes sense to give the model by increasing the generalizability of the data about the distinction between different types of communication and classes Norris, 1982; Salsali et al., 200. (.Six main themes which were derived from the content analysis study was used to formulate the model. Some believe that there may be a relation between the results of qualitative research and conceptual models and conceptual models also can be used in all phases of qualitative research )Cañas, Novak, & González, 2004; Chrobak, Sobrino, & Ponzoni, 2008; Daley, 2004; Maxwell, 2004; J. Wheeldon, 2011; J. P. Wheeldon & Faubert. (Concept maps as a visual tool to represent a set of conceptual meanings in the context of the statements )Daley, 2004(. Findings from the content analysis of ECE plotted as a conceptual model.

In the fifth step of the Norris method, hypothesis performs. The hypothesis would be applying for future research.

## FINDINGS

The findings are presented in three parts. In the first part, the results of the content analysis that led to the extraction of meaning units, sub-codes and the main themes will present. In the second part, the operational definition of the concept of the ECE and the hypothesis will present and following the final model presented in the third section (Figure: 2). Using MAXQDA software, the all ten interviews of ten participants transcribe to texts. The participants were the educated and expert people of environment fields. They were 3 women and 7 men. All of them were involved in the environmental education. Also the 5 texts of scientific and governmental literatures and statements which were related to environmental education, imported to the software. Then carefully read the text and meaning units were identified. The clusters of meaning units formed and 22 sub-code and finally, 6 main codes (themes) extracted (Table: 1). Here are two examples of how to extract the theme "Learning orientation" and "Conditions-based" are given.

**Table: 1**  
**Meaning units, the sub-codes and Themes of Environmental Communal Education which have extracted by content analysis method**

Meaning Units	The Sub-codes	Themes
Expect all organizations involved in the program, the costs, failure service to all organizations, the extent of environmental issues, extensive contacts, extensive environmental issue, the administrative bureaucracy, administering an educational practices for all groups, the temporary nature of teaching, learning wrong choice, the work practices, inadequate training, incorrect definition of education	Organizations barriers in the implementation Breadth of topics Inappropriate practices and definitions	Concerned-based
Media and cultural centers, specialists in educational sciences, social science experts and Broadcasting, municipalities, education	Media involved factors in training Professionals involved factors Governmental/Nongovernmental Organizations	Workgroup-based
Government agencies involved in environmental awareness, the need of local priorities in the program, interactive relationship with the social and cultural foundations of society such as poets, Muslim or religious, the structure of the society in prioritizing	Cultural requirements for success in the implementation of ECE programs Communicational requirements Religious rules and believes Individual and community needs	Condition-based

goals, common objectives, environmental organizations, public participation, having the motivation, patience, time and again, to give priority to education in different societies according to the formal curriculum, use the upper levels of Bloom taxonomy (analysis), the promotion of culture and community leaders need to research the classification of environmental pollutants, understanding and respect for different levels of education, employment experts have expertise in all environmental plans define the needs in education, the fit between social communities and educational content, classification learners, involve all segments of the education community, there is a lesson planning, teaching methods suit different people's knowledge and responsibility Scientific method, distance education, education should lead to behavior change, goal-oriented training, learner-based training , contacts, formal and informal education, hidden training, education for the environmental, education in the environmental, education with environmental	Educational materials	
Education and training of the receiver, the missionaries, administrators, all classes of people, decision-makers and decision-makers, education officials is essential, priority is education, housewives, housewives in the community, education, environment, women at home the second priority was education, environmental education-based audience of students and families a priority, women	Formal / Informal methods of ECE Distance education Environmental dependency	Methods-based
	Low grade target groups at the ECE High grade target groups	Learner-based
	Formal /Informal groups Family members groups	
Abuse of the destructive nature of the environment, welfare politics as cause of environmental degradation, reduce juvenile mortality, all living things, the environment, public education with private and public aspects, social and cultural issues in environmental	The fields of environmental communal education Public and private fields Environment protection and health Environment culture and ethics	Fields-based

education, environmental pollutants rates, health standards, environmental, cultural, environmental, social, environmental, human food chain, biodiversity, industrial pollution, drug abuse, environmental knowledge, and attitudes to keep the environment healthy environment, eco-system, with environmental standards, environmental health, environmental sustainability, environmental protection, culture, environment, culture, environmental protection, environmental sociology, environmental thought, environmental law, environmental behaviors as environmental behavior, see environment biological, avoiding superficial look at environmental education, environmental ethics, ethics education in an environment the role ethics	Biosychosocial behaviors
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When the researcher read the interview retrieve the following meaning units. It concluded that there is a wide range of public and specific people who are involved in the environmental education:

*"Environmental education for the general public which is aimed at increasing environmental awareness, considering all the contacts over several years, but has to rely on more students. The students are a big population" (Interview1).*

Or,

*"Women, children, teachers, imams, priests, professors are the different groups of the environmental audience" (Interview 2).*

*"... Ministers, deputy ministers, heads of organizations, managers, non-governmental organizations, the decision-maker persons, they must be trained in the environment"(Interview 2).*

Therefore, in the environmental education have to focus and pay attention to the audience and diversity of learners. Thus, the meaning units formatted to the cluster of sub-codes such as "contacts with high-level education, with low level education, family groups, formal and informal groups". The set of clusters, this abstraction obtained: environmental education is a process of learning orientation. Thus, "Learning Orientation" as a theme extracted. Once the meaning units were obtained, the researcher found other sub codes.

*"Environmental education has been difficult because of the need to manage different parameters such as variations in audience. Contact one of our employees. Need a specialist.*

*A medical doctor must know the scope itself and trash and debris from a construction worker to know about. Another parameter is the subjects of the environment. There are different variations of environmental issues ....*  
*"(Interview 3).*

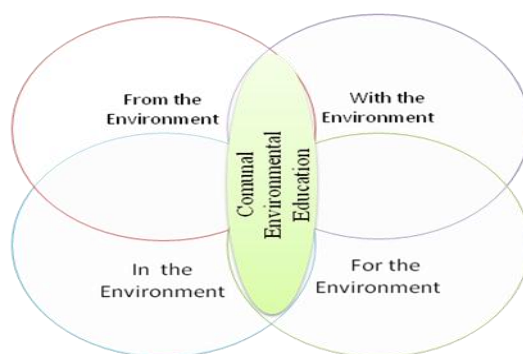
***"The methods of environmental education are diverse, and according to ethnicity, nationality, and differences. The education method should be local. We have in the border areas the foreign and local television networks use and less use of the national TV network. So, the investment of radio and television, primarily due to the border people behavior, it will not benefit. " (Interview 7).***

***"Countries, and the capacity of four different people. Learning classes are different. Cleverness of people is different. We have 31 provinces in our country. The reasons are different for different states. Because of these differences, I cannot copy the Ilam province educational instruction to other provinces. So, educational methods are determined in accordance with the learner specification. In a religious context and structure in an area where there are religious beliefs, there is a learning environment using religion to do much better. For example Sistan and Baluchistan province may be less sensitive. Local dialect, language, cultural background affects the methods. (Interview 3).***

The code consisted of sub-factors that are preventing the implementation of a program of environmental education as barriers such as institutional, cultural and ethnic, geographical, the extent of environmental subjects, definitions and explanations of false beliefs and the environment. Thus, a researcher at the abstracting of the clusters and sub codes, worries and concerns for environmental education to be inferred under the theme of "Conditions-based". Finally, according to data explication 6 themes extracted: Condition-based, Methods-based, Learner-based, Concern-based, Workgroup-based, and Field-based. On the base of Norris method steps, the operational definition of ECE extracted. In fact the definition was the response to this question : "In practice, what will be known application of the concept of ECE ?" (Norris, 1982).

***Operational definition of ECE: A set of purposeful and continuous training activities of the learning-teaching process to different strata of society, from the micro to the macro, natural person or legal person, to create awareness, knowledge and appropriate attitudes to the environmental protection to provide context for sustainable development in the country via culture promotion of environment protection.***

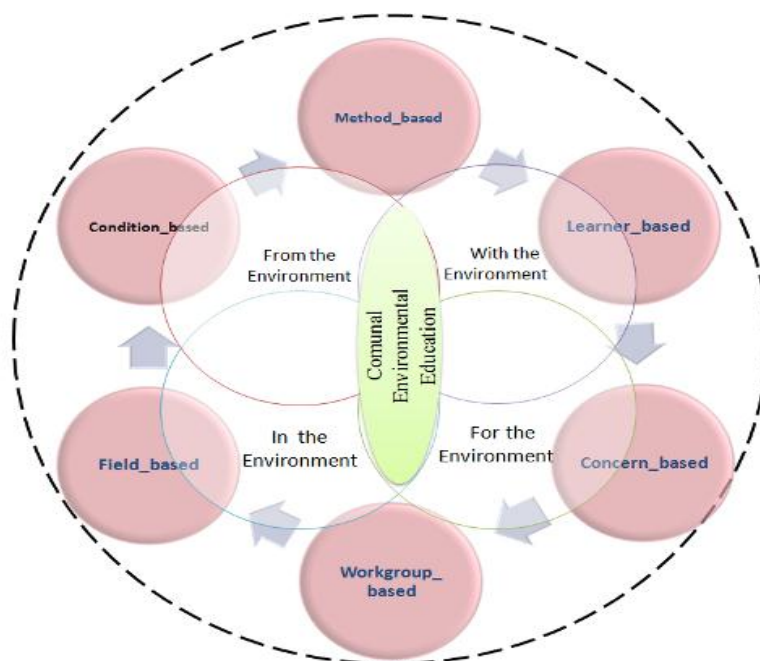
On the base of themes and operational definition the model of the ECE developed. According to literatures, the approaches of environmental education include: education about the environment, education in or from the environment, and education for the environment (H.-F. Hsieh & S. E. Shannon, 2005; Palmer, 1998). These approaches contribute reflect the difference goal of environmental education. We used and modified these 3 approaches to 4 and inserted it in the context of our model (Figure: 1)



**Figure: 1**  
**The modified model of interaction of environmental education.**



It means that there is a relation between the elements of our model and approaches. Also, our Hexa-based model consisted of 6 main elements which are in a systemic relation with the environment. This model shows that we can set the main themes, although it seems themes are identified separately, but they are subject to a systematic set and also the relationship between them is aggregation or alone (Figure: 2).



**Figure: 2**  
**The Hexa-Based Model of Environmental Communal Education.**

Finally, the hypothesis derived:

*"The distance education methods, more than traditional methods, have a greater impact on culture promotion of the environmental protection"*

## DISCUSSION

Although there is some reports of attempt to define different currents as general way of envisioning and practicing environmental education (Stapp et al., 1969), in this study, we have applied a qualitative method strategy to develop a model to environmental communal education. Overall, findings from both narrative literature review and content analysis show that perception of ECE is the most significant factor that influences government' decisions to engage in environmental education. To increase commitment to environmental communal education, involved organizations and disciplines must be made to believe that they have control over the subject.

This can be done through interventions targeted at increasing sense of belief in the availability of resources, promoting flexibility in the curriculum and education methods, and providing the necessary knowledge and skills needed to effectively instructional design of environmental communal education.

Also, other factors are necessary and equally important in ensuring a sustainable development. For example, the quantitative analysis shows that subjective norms, attitudes, intentions of the workgroups have a significant influence on the promotion of ECE.

The goal and purpose for most environmental education evaluation is to make judgments about the value and worth of the program to decide how to improve market, expand, or change it. The evaluation usually focuses on the outputs, outcomes, and impacts of the program on the audience and environment (Monroe, 2010). The environmental communal education model, also, shows elements that may be used in the evaluation program. On based on the operational definition and the developmental model of the ECE, the diversity of the target population and educational content, it seems the most appropriate teaching methods, are the distance education methods.

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## REFERENCES

- Cañas, A. J., Novak, J. D., & González, F. M. (2004). Using Concept Maps In Qualitative Research. Paper presented at the The First Int. Conference on Concept Mapping, Spain.
- Carley, K. (1993). Coding choices for textual analysis: A comparison of content analysis and map analysis. *Sociological methodology*, 23(75-126).
- Chrobak, E., Sobrino, & Ponzoni, E. M. (2008). Concept Maps For Qualitative Analysis-The Traces Of High School In Graduates From Patagonia. Paper presented at the The Third Int. Conference on Concept Mapping, Finland.
- Creswell, J.W., & Clark, V.L.P. (2007). *Designing and conducting mixed methods research*: Wiley Online Library.
- Daley, B. J. (2004). Using concept maps in qualitative research. Paper presented at the Proceedings of the First International Conference on Concept Mapping.
- Farajollahi, M., Zare, H., Hormozi, M., Sarmadi, M.R., & Zarifsanaee, N. (2010). A conceptual model for effective distance learning in higher education. *Turkish Online Journal of Distance Education-TOJDE*, 11(3), 63-77.
- Glasziou, P. (2003). *Systematic reviews in health care: a practical guide*: Cambridge Univ Pr.
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative health research*, 15(9), 1277-1288.
- Hsieh, Hsiu-Fang, & Shannon, Sarah E. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative health research*, 15(9), 1277-1288. doi: 10.1177/1049732305276687
- Jia-nan, C. (2012). Contributions of Environmental NGO to Environmental Education in China. *IERI Procedia*, 2, 901-906.
- Keegan, D.J. (1980). On defining distance education. *Distance education*, 1(1), 13-36.
- Kuckartz, U. (2001). MAXqda. Software for qualitative data analysis: Berlin: VERBI Software. Consult. Sozialforschung. GmbH.

- Lackey, N. R. (2000). Concept clarification: Using the Norris method in clinical research. *Concept development in nursing: Foundations, techniques, and applications*, 193-208.
- Maxwell, J. A. (2004). *Qualitative research design: An interactive approach*: Sage Publications, Incorporated.
- Mehri, Soheil Najafi, Ebadi, Abbas, Karimooi, Majideh Heravi, Foroughan, Mahshid, & Sahraei, Hedayat. (2012). Experiences Living With Fatigue in Iranian Veterans Chemically Injured by Sulfur Mustard Gas: A Phenomenological Study. *Asian Nursing Research*(0).
- Monroe, Martha C. (2010). Challenges for environmental education evaluation. *Evaluation and Program Planning*, 33(2), 194-196.
- Neuendorf, K. A. (2001). *The content analysis guidebook*: Sage Publications, Incorporated.
- Norris, C. M. (1982). Concept clarification: An overview. *Concept clarification in nursing*, 11-19.
- Palmer, J. (1998). *Environmental education in the 21st century: Theory, practice, progress and promise*: Routledge.
- Petticrew, M., Roberts, H., & MyiLibrary. (2006). *Systematic reviews in the social sciences: A practical guide*: Blackwell Pub.
- Rodgers, B. L., & Knafl, K. A. (1999). *Concept development in nursing: Foundations, techniques, and applications*: WB Saunders Co.
- Salsali, M., Mohammadpur, A., & Fakhr Movahedi, A. (2007). *Principles and techniques of concept development*. Tehran: Boshra.
- Shobeiri, SM, Prahallada, NN, & Omidvar, B. (2007). A comparative study of environmental awareness among secondary school students in Iran and India. *International Journal of Environmental Research*, 1(1).
- Stapp, W. B., Bennett, D., Bryan, W., Fulton, J., MacGregor, J., & Nowak, P. (1969). The concept of environmental education. *Journal of environmental education*, 1(1), 30-31.
- Stemler, S. (2001). An overview of content analysis. *Practical assessment, research & evaluation*, 7(17), 137-146.
- Stevenson, R. B. (2007). Schooling and environmental education: Contradictions in purpose and practice. *Environmental Education Research*, 13(2), 139-153.
- Torgerson, C. (2003). *Systematic reviews*: Continuum International Publishing Group.
- Unesco, Unep International Environmental Education Programme, & Unesco. Division of Education for the Quality of, Life. (1990). Environmental Education: Selected Activities of Unesco-UNEP International Environmental Education Programme 1975-1990: UNEP-Unesco.
- Weber, R. P. (1990). *Basic content analysis* (Vol. 49): Sage Publications, Incorporated.
- Wheeldon, J. (2011). Is a picture worth a thousand words? Using mind maps to facilitate participant recall in qualitative research. *Qualitative Report*, 16(2), 509-522.

**Wheeldon, J. P., & Faubert, J. (2009). Framing experience: concept maps, mind maps, and data collection in qualitative research. *International Journal of Qualitative Methods*, 8(3), 52-67.**

**Zhang, Y., & Wildemuth, B.M. (2009). Qualitative analysis of content. *Applications of social research methods to questions in information and library science*, 308-319.**