ENVIRONMENTAL EDUCATION – OERS FOR RURAL CITIZENS. PROJECT MANAGEMENT AND RESULTS

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ABSTRACT

In this article, the main aspects of a managerial nature are presented and analyzed, as well as the results of an international cooperation project in the field of environmental education in which universities from Romania and Iceland participated. Creating open educational resources and accessing them through an online learning platform is a good opportunity to ensure environmental education in disadvantaged rural communities. The conception and implementation of an international cooperation project, in the context of the Covid-19 pandemic, generates additional risks that require appropriate response measures. Such projects constitute a conducive environment for the transfer of knowledge and lessons learned.

KEYWORDS: education, environmental, management, project.

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1. INTRODUCTION

The intensification of the scope of the environmental problem is visible in the last decades. The level and complexity of economic and social development have imposed increasingly varied and complex relationships between man and the natural environment. Paradoxically, technical-scientific progress has not led to a disappearance of man's dependence on natural resources but to an increase, based on knowledge, made concrete by the accentuated tendency to dominate and transform the natural environment.

From an epistemological point of view, if at the beginning scientific thinking was oriented towards the knowledge of nature, in the contemporary era it subsumes the effort to limit the effects of human action on the natural environment, starting with the seventh and eighth decades of the last century. The studies of Georgescu-Roegen (1971) and the Meadows report (Meadows et al, 1972) are relevant in this regard.

The need to ensure the ecological balance left the national framework and reached the planetary one. This fact is increasingly visible at the level of specific policies and programmatic documents adopted at the global level, especially in the last ones: Agenda 2030 for sustainable development or European Green Deal (the European climate legislation enshrining the objective of achieving climate neutrality in 2050). At European level the European Just Transition Mechanism will focus on the regions and sectors most affected by the transition, as they depend on fossil fuels or processes with high carbon dioxide emissions.

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The fact that the European Green Deal addresses the issue of the environment and digitalization in the perspective of environmental objectives outlines digitalization as one of the possible solutions to reduce the impact of socio-economic activities on the environment. The Covid-19 pandemic has shown that the call for digitalization has important effects on the reduction of pollution that occurs due to the scale of transport and traffic.

These approaches could not remain without repercussions in the area of education and especially education dedicated to environmental issues. If at the university or research level this is well represented in all the countries of the month, the perception of the ecological issue by the general public, especially in the rural area, is still low. Especially in disadvantaged areas in Romania, the ecological problem, of the need for environmental protection, is perceived as marginal in relation to the daily subsistence concerns of the rural population. In Iceland, many rural areas are at great distances from the urban area and do not have environmental concerns as an essential element in their sphere of concern.

That is why it is necessary to increase the awareness of the rural population, using the opportunity of digitalization, so that the problem of protecting the natural environment also reaches disadvantaged rural communities or located at great distances from important urban centers.

The study presented in this article tries to answer, in the existing context in the rural area of Romania and Iceland, the following questions:

- To what extent can a joint educational project, carried out by organizations from Romania and Iceland, use digitization, so that environmental education reaches disadvantaged rural areas?
- How open educational resources can be used to facilitate inter-country, inter- and intraorganizational and inter-area (urban-rural) knowledge transfer?
- To what extent can universities use train-the-trainers approaches to facilitate the rural population's access to environmental education?
- What are the defining elements of the management of a Romanian-Icelandic international cooperation project and what are the results sought/achieved?

Although comparative studies have been carried out on environmental projects in Romania and Iceland (Simion et al., 2021) or on the importance of international collaborations in environmental education (Finger, 2021), in this paper these aspects are approached from the perspective of the role of project management and knowledge transfer in achieving the expected results.

2. LITERATURE REVIEW

The issue of the environment has been a constant concern of specialists for the last 50 years. Starting from the already mentioned works of Georgescu – Roegen (1971) and Meadows (Meadows et al., 1972) the specialists continued to consider the anthropic action on the environment globally. In Romania, Constantinescu (1976) created his own model of the economy of the natural environment starting from the distribution schemes, which started from the following premises: (i) scientific and technical progress should also be carried out as ecological progress, (ii) the general economic balance should include the obligation to ensure the dynamic ecological balance; (iii) investments made in environmental protection are considered capable of bringing net income.

The studies in Romania regarding the natural environment and its protection have rather an approach from a general perspective without particularly targeting the rural area. However, there is enough research dedicated to the natural environment in rural areas. Among these, we can mention those carried out by Szabo, Shriver and Longo (2022) regarding projects with an impact on the natural environment in the rural area (the case of investment projects in the extractive industry from Roşia Montană). Also focused on the specifics of environmental problems in the rural area are the researches carried out by Prăvălie et al. (2020), Tudor and Fernoagă (2015), Vasile and Iordăchescu (2022), Paruch et al. (2019), Cebotari et al. (2017). Whether they are intended for ecological problems in the rural area, or whether they are intended for the use of forms of renewable energy in

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the rural area of Romania, the research carried out shows the extent and dynamics of environmental problems in this area, but also the need for their awareness by local communities.

And in the case of Iceland, the research carried out has a rather general character, the urban-rural dichotomy being rarely present. Moreover, rural communities in Iceland are relatively few and territorially dispersed. Most studies and research that have as their subject:

- environmental protection and waste management in rural areas (Óskarsson, Agnarsson, Davíðsdóttir, 2022; Aquino, Leah Burns and Granquist, 2021);
- energy production from geothermal or other renewable sources (Kjeld, Bjarnadottir and Olafsdottir, 2022; Gunnarsdottir et al., 2022; Ólafsdóttir and Sæþórsdóttir, 2019);
- sustainability of certain economic sectors (Shortall and Davidsdottir, 2017).

The breadth of studies on environmental issues in Iceland shows that there is a concern among researchers and teachers, without existing research showing that this topic is a priority for rural communities in Iceland. As in the case of Romania, an instrument is required to ensure the transfer of knowledge from the area of scientific research and tertiary education to rural communities.

In parallel with the constant growth of concerns regarding the environment, the trend towards digitization of economies and societies is becoming more and more accelerated globally. Digitalization increasingly influences all fields of activity, including education (Lamberti, Lopez-Sintas and Sukphan, 2021; Bygstad et al., 2022; Haleem et.al, 2022). The processes of digital transformation of education, present globally, have affected in recent years (especially as an education solution during the Covid-19 pandemic) both Romania (Wetzl, 2010; Roman and Plopeanu, 2021) and Iceland.

Accelerating the digitalization of education processes also acts as an enabling factor in the case of environmental education of isolated local communities. The existence of open educational resources transmitted through dedicated online platforms is likely to increase access to knowledge in the field of environmental education (Perniu et al., 2021).

The increase in interest in the natural environment and its protection in the context of the acceleration of the digitization trend of economies and societies, both revealed by the literature review, creates the premises for collaborative projects that pool knowledge in the field of environmental education.

3. METHODOLOGY

A single case study is presented, the *Environmental Education - OERs for rural citizens* project, the research being oriented on: (i) revealing the particularities of project management in the case of an international cooperation project; (ii)the presentation of the project results and how their achievement was approached by the project team, the approach to digitization for the use of open educational resources.

In order to research all these aspects, the stages of the life cycle that the project has gone through so far were used: the formation of the consortium, the preparation of the project proposal, the evaluation of the project and its implementation. The main documents from which the necessary information was collected are: the project proposal submitted for evaluation and financing (the narrative and the financial part - the project budget); project implementation scheduling (Gantt chart); interim activity reports; stage reporting for the period November 2020 – January 2021).

The discussions held between the partners at the two transnational project meetings as well as at dissemination events already carried out within the project (multiplier events and workshops) were also used as sources of information for the research. They allowed the contextualization of some information from the interim reports and the highlighting of particular aspects regarding project management.

4. PROJECT MANAGEMENT AND RESULTS

4.1 Project history and objectives

The Environmental Education – OERs for Rural Citizens (EnvEdu – OERs) project has, until the time of writing this article, gone through three essential stages: project conception, project evaluation for funding and project implementation.

The genesis of the project lies in the desire of the project team from Transilvania University of Braşov (UNITBV) to carry out a project to ensure the transfer of knowledge about the environment from university level to the level of the rural population in isolated and disadvantaged communities. The potential project manager felt that the project idea should be fleshed out by co-opting other universities having a project experience. For this reason, she participated to a workshop "The dimension of internationalization through bilateral cooperation between Rannís – The Icelandic Centre for Research, Reykjavik University and The Military Technical Academy of Bucharest" (May 2017), International Bilateral Project in the Higher Education Area, supported by the EEA Financial Mechanism 2009-2014, hosted by BUES.

The Romanian members of the potential consortium (Transylvania University of Braşov and Bucharest University of Economic Studies) resumed discussions in Bucharest (March and December 2018) for preparing a visit to Iceland in January 2019. A preparatory visit was carried out in Iceland that included meetings with members of several departments within Reykjavik University, which resulted in the initial project proposal (January 2019), evaluated and rejected in April 2019.

As a result of the weak points identified by the evaluators in the initial project proposal, a fourth partner was co-opted in the consortium (Gheorghe Asachi Technical University from Iași) and the project was submitted for financial support from Education, Scholarschips, Apprenticeships and Youth Entrepreneurship Program (ESAYEP), EEA Financial Mechanism, 2014-2021 in January 2020. This project proposal was evaluated and accepted for funding in April 2020 and project implementation started in November 2020. A synthetic history of the main stages of the project development from the initial idea at the implementation stage is shown in the following table.

Table 1. Project EnvEdu– OERs – from idea to implementation

No	Stage	Period	Activities	
1.	First contacts with representatives from Reykjavik University	May 2017	Participation at a workshop organized at BUES, with EEA grants financial support; Meeting the representative of the School of Business, Reykjavik University	
2.	Project idea	March 2018	The emergence of the project idea; Search for Romanian partners (BUES); The first consortium (UNITBV & BUES)	
3.	Discussion of the project application initiative	December 2018	Meeting at BUES between the members of the initial consortium; Decision on mobility in Iceland using different funding sources.	

No	Stage	Period	Activities
4.	Preparatory visit in Iceland (RU)	January 2019	Meetings with members of several departments; Extention of the project consortium (UNITBV &BUES& RU) Outline of the first form of the project (establishment of teaching modules and distribution of tasks of the partners).
5.	Submission of first application of the project	January 2019	Submitting the first project proposal (rejected)
6.	Extention of the consortium and submission of the second project proposal	January 2020	Co-opting a new partner and forming the final consortium (UNITBV, BUES, RU & TUIASI); Submitting the second project proposal.
7.	Evaluation of the second project proposal	January – March 2020	-
8.	Selection of the proposal for financial support	April2020-July 2020	Approval of the proposal; Signing the contract between the program operator (PO) and the project promotor (PP-UNITBV), as well as the agreements with the partners
9.	Project implementation	Starting with November 2020	Carrying out the planned activities; Achieving Deliverables.

Source: own processing of information from project proposals EnvEdu – OERs

From Table 1 it can be seen that the EnvEdu – OERs project has traveled a long way from idea to funding and implementation. The project was marked by three triggering events: the emergence of the idea, the co-optation of the Icelandic partner and the definition of the final consortium/partnership (with four partners).

The main objectives of the project were: (i) to develop specific intellectual outputs (six teaching modules, one learning platform, four conference papers, one set of policy recommendations) that will be available free on the project electronic learning platform for all target groups; (ii) to implement project events (two multiplier events and two workshops) meant to facilitate the basic scientific information to the local community.

4.2 Project management

A project coordinator from Transilvania University of Braşov and three from the partners involved in the project realization consortium were nominated for project management. From the perspective of project management, Table 2 presents aspects of how to achieve time, cost, quality, human resources, communication and risk management.

Table 2. The main components of *EnvEdu – OERs* project management

No	Project management	Methods and techniques	Observations
	element	used	
1.	Time management	Gantt chart	Predefined activity types at the program level; The need to update the chart due to the Covid- 19 pandemic.
2.	Cost management	The project budget Project cost baseline	Proposal to use Earned Value Management
3.	Quality management	Project quality planning; methods and techniques specific to quality assurance	-
4.	Human resources management	Recruitment & Selection of Training Project Teams	-
5.	Communication management	Communication plan; Reporting to the PO and PP; Specific dissemination events oriented towards stakegholders	Communication plan with specific targets regarding the stakeholders involved
6.	Risk management	Risk register SWOT analysis	All specific steps are represented; specific risk response actions are foreseen and implemented.

Source: own processing of information from EnvEdu- OERs project documents

The analysis of the specific elements of project management shows that almost all of them had a relatively adequate representation of the nature of this type of project. The use of only a classical method for time management is due to the predetermination of the type of activities and their small number. Mainly type macro-activities defined in advance at the program level are scheduled, which imposes restrictions in the process of identifying project activities. The limited number of activities in the project and their predefinition therefore require the use of Gantt-type calendar charts for scheduling activities.

The originally scheduled activities had to be rescheduled due to travel restrictions imposed by the Covid-18 pandemic. Thus, the implementation time of the project was extended with six months and some of the activities originally scheduled in 2021 have been rescheduled to 2022 (the first multiplier event and both workshops).

The project budget was oriented by expenditure categories and activities. Based on it, a basic plan of the project cost could be made. The structure of the project budget by expenditure category is presented in Figure 1.

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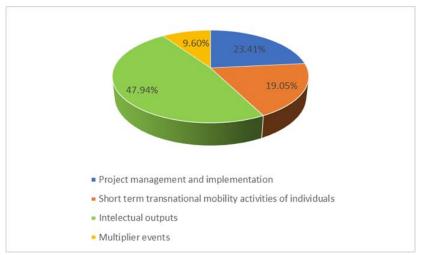


Figure 1. Structure of project expenses

Source: own processing of information from EnvEdu– OERs project documents

It can be seen that in the structure of the project, the largest share belongs to the expenses for the realization of intellectual outputs (almost half of the total budgeted expenses) and those related to project management. Almost a fifth of the budget is allocated for the transnational project meeting (in the form of transport and subsistence expenses).

From the proposal level, the project had a detailed communication plan in which the main types of communication used, means of communication and mandatory communication events are mentioned (Figure 2). Communication is focused on the relationship with the main and secondary stakeholders of the project.

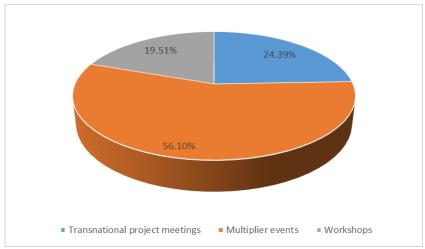


Figure 2. Share of the number of participants in the events provided for in the communication plan of the project

Source: own processing of information from EnvEdu- OERs project documents

From Figure 2 it can be observed that, the multiplier events hold the largest share in terms of the number of participants because they are oriented towards local public administration and rural communities. They are followed by transnational project meetings (TPM) and the two workshops organized within the project.

The risk management process included all three important steps (identification, analysis and response). The most important materialized risk was the one related to the Covid-19 pandemic, which affected both the initial programming of the project's implementation and the way certain

activities were carried out. The actions taken in response to the emergence of this risk at the beginning of 2020, after the submission of the project proposal, are presented in the Table 3.

Table 3. Impact of risks related to the Covid-19 pandemic and response measures

No.	Project area	Impact description	Response measures
	affected		
1	Time	Impossibility of meeting	Updating the Gantt chart by
	management	the schedule of some	rescheduling some activities and
		activities (TPM,	extending the total duration of the
		workshops)	project execution by 6 months
2	Communication	Impossibility of on-site	Online implementation of TPM 1
	management	meetings and workhsps:	(kick-off meeting) prevoiusly
		TPM1 (Brasov), TPM2	scheduled to be organised in Braşov;
		(Reykjavik), C1	Rescheduling of TPM 2 (Reykjavik),
		(Reykjavik) and C2	workshops C1 (Reykjavik) and C2
		(Bucharest) workshops	(Bucharest) from 2021 to 2022.
		in 2021	
3	Cost	Modification of the	Measures to accelerate the progress of
	management	project cost base plan	the project cost in the year 2022.
		(cumulative project cost	
		curve) in 2021	

Source: own processing of information from EnvEdu– OERs project documents

4.3 Project results

At the initiation of the project, the four partners set out to obtain results that would lead to the achievement of the project's objectives. The results of the project refer to:

- a) Intellectual outputs: six teaching modules; one learning platform; four conference papers; and a set of policy recommendations;
- b) Two multiplier events and two workshops aimed at disseminating information from the project to interested stakeholders, especially those from the rural area.

The six teaching modules and the partners responsible for their development are:

- TM1: Sustainable communities and social communication (UNITBV + RU);
- TM2: Environmental Quality (UNITBV + RU);
- TM3: Environmental Management, Impact and Risk (TUIASI);
- TM4: Waste Management in Rural Communities (TUIASI+ UNITBV);
- TM5: Water Resources and Water Balance for Sustainable Community (RU);
- TM6 Environmental Projects Management (BUES).

As can be seen the EnvEdu – OERs project has an important contribution to achieving the Education, Scholarschips, Apprenticeships and Youth Entrepreneurship Program (ESAYEP) targets. Moreover, through the approach of training trainers from the rural environment (teachers, representatives of local administrations, other relevant stakeholders for the project), people with visibility and notoriety in the local communities, the aggregate impact of the project will be much greater than the relevant by the number of participants in joint events. In this way, a snowball type effect is obtained that will increase more and more the number of residents from disadvantaged local rural communities interested in environmental education.

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5. DISCUSSIONS. LESSONS LEARNED

The analysis of project management and the progress of the EnvEdu – OERs project reveals that it has become part of a wider context of digitization of education. The data related to the design and implementation of the project confirm the adequacy of environmental education to the trends revealed by the studies developed by Lamberti, Lopez-Sintas and Sukphan (2021); Bygstad et al. (2022) or Haleem et al.(2022). The implementation of the EnvEdu - OERs project shows that the creation of open educational resources transmitted through dedicated online platforms and the use of a train the trainers approach amplifies and facilitates the transfer of knowledge, especially in the field of environmental education (Perniu et al., 2021).

The conception and implementation of the EnvEdu – OERs project allowed the formulation of several observations that can be transformed, through a formalized process of knowledge management, into lessons learned for the partners in the consortium:

- 1. The realization of the idea in the form of a financed project takes a relatively long time and therefore an optimal form of consortium must be found to ensure, especially in the case of international projects, the fruition of the windows of opportunity from the existing programs;
- 2. Geographical distances, language barriers and cultural differences can only be partially compensated by the existing technical means (the use of virtual communication platforms in the project) and by the solidity of the links within the partnerships;
- 3. In international cooperation projects, special attention must be paid to risk management because the magnitude of the impact of risks (the case of Covid-19) on the duration of execution and the progress of the cost of projects is much greater than in the case of those financed from national sources. In addition, there are specific risks (communication, currency), specific to this type of projects, which can affect the realization of the projects.
- 4. Environmental education, the main goal of the project, is a perennial value that generated the employment of some universities from Romania and Iceland in the project.
- 5. The transfer of knowledge between universities in areas located at great distances (as in the case of Romania and Iceland), with environmental problems that sometimes seem different, creates the necessary synergies to improve environmental education in rural areas, especially in disadvantaged communities.

6. CONCLUSIONS

The last decades marked an increase in the concerns of the society and decision-makers regarding the protection of the environment and the sustainability of development. The increase in awareness of environmental issues, at the global level, has also led to the growth of concerns for environmental education, reflected also by the appearance of new study programs at high school and university level.

This article presents how environmental education can be improved, especially in the context of the digitalization of the economy and society, by using open educational resources and dedicated online platforms. For members of rural communities, where distance from university centers is a problem, the use of online platforms that include open educational resources is an opportunity. The EnvEdu – OERs project, used in this article as a case study, is an opportunity for rural communities in Romania and Iceland, but also for other stakeholders in Romania and Iceland, interested in environmental education.

The six teaching/training modules developed by the EnvEdu - OERs project partnership, accessed through the online learning platform, ensure adequate training for members of local rural communities in the field of environmental education. The six modules are complemented by other scientific resources (conference papers) or policy recommendations that can be taken over by representatives of local communities. The common Romanian-Icelandic experience creates a

concentration of educational resources in the field of environmental education, for the benefit of local communities in both countries.

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