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Virtual educational model for remote communities in Chocó, Colombia

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ABSTRACT

This research seeks to analyse and propose a solution to support classroom-based teaching in the Department of Chocó, Colombia, which is located in a rural area and has been the subject of many social projects for the development of its people. Due to the disparities in different regions of the country, the education sector is forced to look for new working environments that are suitable for rural communities who were left out in the development. For this reason, a Virtual Learning Community is proposed in the to improve the educational conditions and relate how the use of technology and Open Educational Resources could contribute to it. The participants of this study were the teachers and students of the school. Results show that teacher training is essential so that they can act as leaders in their community

***Keywords*:** Virtual learning environments; open educational resources; isolated communities; community education.

INTRODUCTION

Education in rural and remote contexts has been the subject of study and concern for Human Rights Organizations around the world. Colombia is a country with over 48 million people; in the year 2014, 28.5% of the population lived in poverty, and 8.1% in extreme poverty (El Universal, 2015). The Colombian Finance Minister in the Leadership Summit (Semana, 2015) mentioned that fulfilling the goals of education in the country requires taking actions and planing solutions based on solidarity and engagement of the society. Additionally, authorities must envision effective programs and assign resources to achieve the established goals.

The advancement in technology relates to education and its accessibility (Ramírez, 2015). In the international arena, there have been several proposals that promote open access to education through information and communication technologies and internet resources. OpenCourse Ware, MERLOT, and OpenLearn from United Kingdom University are examples of programs that aim to connect education and students and provide open digital resources.

The term Virtual Learning Environment (VLE) is a broad concept that comprises the use of a virtual space for promoting social interaction and achieve educational goals (Dillenbourg, Schneider & Synteta, 2002). VLEs are no exclusively for distance learning, as they can also be a convenient resource for classroom activities. VLEs offer efficient services since their virtual characteristics do not demand the presence of students and professors in a physical environment. With the development of internet and the arrival of new technological tools, distance training through VLEs becomes an alternate mode of teaching. The internet has helped effectively and efficiently to improve the educational processes, as shown in several proposals and projects based on information and communication technology (De Haro, 2005).

The model of distance education has found an ally in Open Educational Resources (OER) and VLEs. The term OER was defined in 2004 as a collection of learning objects and contents which can be shared in learning communities. The integration of OER into the educational process could benefit as a strategy to support the teachers' responsibilities and to improve the quality of education (Johnstone, 2005). In contrast, VLEs are defined as a set of systems where individuals can interact synchronously and asynchronously; the environment is based on the curriculum in which teaching takes place. The use of this kind of networks has grown, especially due to their advantages of data processing speed and storage capacity (Garcia, 2003). In distance education, many alternatives have been proposed to promote changes in teaching towards the recovering and rebuilding of the confidence in the student's learning. However, technological innovations cannot be isolated from teaching; on the contrary, they must help transform the educational system. As León (2002, p. 4) states: "we must study and promote new ways to communicate and manage knowledge, based on new technologies, aiming to improve the quality of academic work; it is the challenge that higher education faces to maintain high competitiveness and future development."

A belief about distance education is that it is not completely effective for all kinds of people, since they come from different cultures and countries (Assan and Thomas, 2012). However, learning can be received in a practical and functional way, even with students from different backgrounds (López, 2006). As a strategy to achieve effective learning, the modules and units in an online course must be structured and accessible for their use and understanding. Another held belief is that the distance education is of low quality, due to the lack of reviewers that assure the appropriateness of the materials. In this regard, Salazar (2000) points out the need to consolidate an academic community for the validation and authenticity of the distance education modality.

In the context of isolated communities with low employment opportunities, it is important to consider the quality and equity benefits that can arise with the implementation of a distance education model. Achieving high-quality distance learning can be challenging, but it is relevant for quality. Rogers (2003) warns that when including innovative elements in a classroom, there must be special care to avoid imbalances in the scenarios where they are developed.

For achieving a solid educational structure based on innovative models, two important aspects must be taken into account: first, education can be developed in different forms and scenarios because not all contexts have the same requirements; second, education can be carried out through various modalities, according to the needs of the students. The model of online education in virtual learning environments and the use of open educational resources enables students to develop additional skills to those from traditional schools. In this manner, students acquire the ability to plan and allocate time for their activities; they can organize and measure the importance of their learning; they become architects of their training and development programs necessary for the success of their studies.

The human resources in charge of accompanying the students in these models (teachers) are as valuable as the users (customers/students). Training is an ongoing process, and teachers require spaces to strengthen and develop their knowledge; continuous teacher training goes hand in hand with curriculum models offered in the educational institutions where they work. The incorporation of communications technology does not instantly solve the problems of information access in remote or isolated communities; however, as people start to use them properly, technologies become a beneficial tool for the development of the population. The use of these tools contribute to generating distance education changes that are needed to reduce the digital gaps and differences of opportunities in remote communities.

Virtual Learning Environments could become a strategic union to fill the absence or shortage of work items in the classroom. The massive use of information and communication technology has

become a potential tool for many countries worldwide, however, it is also a reason for global imbalance and causes the digital divide. The term digital divide has been referred to as one of the negative impacts of technology in the different areas of society (Suárez, Gargallo, Torrecilla, Marín, Morant & Díaz, 2015). There is a difference between those who access and use ICTs productively, and those who cannot access these. Ojeda (2005) shows how several communities have been excluded from the emergence of new technologies, or have been separated and isolated due to multiple factors, such as political and social conditions.

Several public educational institutions of Latin American countries do not have enough facilities with optimal infrastructure to allow the construction of quality teaching. Numerous school buildings that are located in marginal, remote or rural areas are in precarious situations, these institutions will probabbly not be benefited with special investment projects and would cost much to remedy the deterioration they have suffered.

In Colombia, the majority of educational institutions of higher education have integrated ICT experiences to their work plans for academic development. Nonetheless, it is not the same case for basic and middle schools, which lack this kind of proposals for the pedagogic models supported by technology. Sánchez (2002) explains that the merging of ICT in institutional projects of each school gives priority to the training and learning of students. In the Department of Chocó, there are 93 official schools from preschool to middle school from which 65% are located in the urban area while 35% in the rural area. Also, there are 13 private institutions in the urban area of the Department. The students of basic education are divided in preschool, primary school, and middle school, in the percentage of 7%, 74%, and 19%, respectively. The number of enrolled students diminishes drastically in middle school, denoting high rates of desertion. The reasons for desertion are poor grades, low self-esteem, school quality and the availability to work, (Jordan, Kostandini and Mykerezi, 2012). The authors point out a significant difference between dropout rates in rural and urban communities. Moreover, the Department of Chocó highlighted that most of the population does not have access to the internet and some areas lack of the electricity service.

Additionally, one of the main concerns in this area is the high levels of illiteracy in the population; the rate is equivalent to 20.90% of habitants, which is above the average in other regions of the country, for example Nariño with 11.06 %. Cauca with 10.38 and Valle with 5.22 %.

Another emerging aspect was the analysis of poverty rates in Chocó, compared to other departments in Colombia. Although there is economic richness from the mining activities, water and forests, and the biodiversity of the region, the statistics show that in the year 2002, poverty in Chocó went from 64% to 78% in three years. This information contrasts to the national numbers where the poverty rates have decreased (El Universal, 2015). Figure 1 shows the comparison between poverty in Chocó and at the national level in the years 2011-2012.

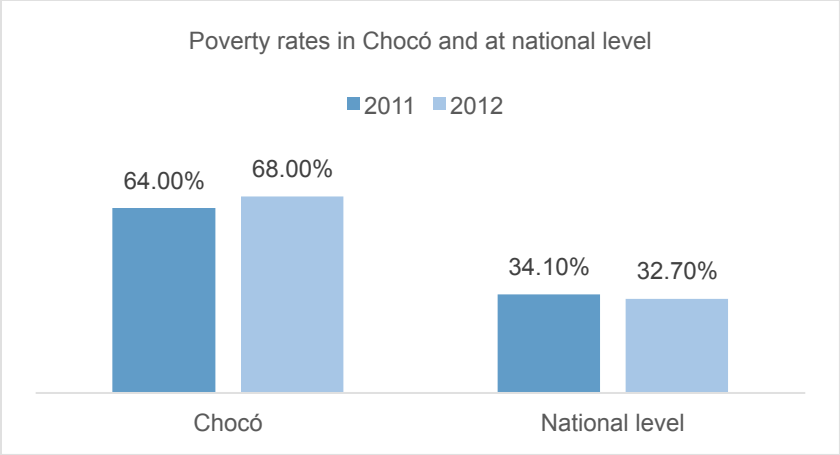

Figure 1: *Poverty rates in Chocó and Colombia*

This research aimed to analyze the context of an educational institution that meets the characteristics of a school located in an isolated community, with low academic performance and poor infrastructure. In the past years, the Colombian Institute for the Evaluation of Education has assessed the students from the 3rd, 5th and 9th grade at the national level, in which the school has obtained low scores. The selected school comprises elementary to high school level. The organization has tried to implement mechanisms of academic improvement to upgrade the performance of their students, but their efforts have not been favorable. One reason is the low interest of pupils in improving their scores and apathy of parents in their children's homework. As for the teachers working at the school, they do not have knowledge of VLE nor have handled OER, which requires technological appropriation for its pedagogical use.

The objective of this research is to identify the initial conditions of a high school in an isolated community for building a virtual educational course for high school students. To integrate VLE in the educational institution, involving clear pedagogical guidelines in their construction, could encourage the high school students' learning, where they can work at their speed of learning, including the form, time and space that the student's chooses; these are characteristics of virtual learning, in order to give tools to teachers and students to achieve their academic performance and enhance the teaching and learning processes.

METHOD

An analysis was conducted during the school year 2014-2015, using the mixed methodology to review and interpret the results. The method was chosen in consideration of the problem of the isolated school, which allowed an inductive logical analysis (qualitative) and deductive logic (quantitative). A survey allowed to evaluate the perception of the students regarding learning through the internet. A survey for teachers was applied to determine the frequency of use of web resources.

The study sought to integrate members of the educational community in the project regarding the use and appropriation of a virtual learning community in an isolated community. The research was approved by the rector of the school for the application of instruments.

The teachers of the institution answered two instruments. The first, an interview, comprised of 12 open questions, which generated information about the research problem; it was answered by five teachers and the school psychologist. The second instrument was a survey about the use and management of information and communications technologies, to learn their level of knowledge, acceptability or not in managing virtual environments for training and participation in the creation and implementation of new learning environments. It is acknowledged that research is a process that requires detailed and thorough analysis, which is heading the search for successes that allows to solve a problem, ensuring the generation of knowledge.

Given the number of subjects and levels on campus, it was decided to start with a population comprised of students from sixth and seventh grade; 50 students of the 6th and 7th grade were randomly selected. Also, 25 teachers from different subjects, as well as the director of the campus, voluntarily participated in the study. One representative of the parents committee and the psychologist of the school were also selected.

For the implementation of the study, the teachers were guided in the management of virtual learning environments and the use of the website *Eduteka* (http://www.eduteka.org/) which provides free open educational resources in Spanish. The site allows users to create digital books or classroom activities.

RESULTS

The following section comprises the results of the research process, presenting the description of the obtained data from the two instruments mentioned above, about the student's and teacher's opinion.

Technology use in students

The following tables show the results of the questions asked to the students: 1) Perception of the internet, 2) Frequency of the use of the internet, 3) Preferred sites to visit, 4) Purposes of internet use, 5) Internet as pedagogical support, 6) Means for reading.

Each of the following tables relates to the different questions on the instrument for students. It shows their perception regarding the use of the internet, the frequency and purpose of use, and other aspects concerning the benefits of the technological tools for reading and other pedagogical work.

Table 1: *Students' perception of the internet.*

What does the internet mean to you?	*Number of students*	*%*
A mean for communication	15	30%
Easy access to information	5	10%
A mean for entertainment	14	28%
Support for school homework	6	12%
Other	10	20 %

Table 2: *Frequency of the use of Internet*

How often do you use the internet?	*Number of students*	*%*
Everyday	9	18%
Two days a week	24	48%
Weekly	9	18%
Rarely	8	16%
Never	0	0%

Table 3: *Preferred sites to visit*

Which sites do you prefer to visit?	*Number of students*	*%*
Entertainment	15	30%
Research	5	10%
Social network, chat, e-mail	30	60%
Health	0	0%
Newspapers	0	0%

Table 4: *Purposes of internet use*

The Internet can help us to improve:	*Number of students*	*%*
Reading and text analysis	11	22%
Updating knowledge	21	42%
Better training	8	16%
To interact with other people	10	20%

Table 5: *Internet as pedagogical support*

Could the internet be a resourceful tool for supporting teaching and knowledge diffusion?	*Number of students*	*%*
Yes	30	60%
No	10	20%
Indecisive	10	20%

Table 6: *Means for reading*

Which mean do you use for reading?	*Number of students*	*%*
Books	40	80%
Internet	5	10%
Magazines/journals	5	10%

The application of the instruments provided an overview of the current situation of the school. A group of 50 students took the survey to measure the use and control of the Internet.

Technology use in teachers

In the analysis regarding the teachers about their knowledge and use of technology, it was found that there is interest in the development of learning environments to improve their pedagogical practice. Likewise, they manifest not possessing abilities to handle ICT; they argue that they do not have much time left to be involved in such activities. Table 7 summarizes the information regarding the teacher's attitude about incorporating technology in academic practice.

Table 7: *Teachers' Participation*

Concept	*Number of teachers*	*Percentage*
Commitment to participate	18	36 %
Not committed to participating	7	14%
Reluctant to participate	5	10%
No comments	20	40%

The information above shows that although 36% of teachers are willing to participate, there is still a majority that did not comment on the topic of technology integration. Participant professors commented that most communities in Chocó do not possess quality connectivity to the internet or the necessary infrastructure to carry out this type of project at their schools.

About the positive effects of teacher training on the use of ICT, it was observed that there were difficulties due to complicated schedule, they expressed that the majority of professors are not available or willing to work additional hours. Some other motives they mentioned were that the professors usually work in other schools.

It was observed that around 35% of teachers expressed they perform adequately in class with technological tools, but the majority of the participant professors do not have the necessary conditions at their schools.

Rural areas' professors conveyed that before teaching through the use of information and communication technology, it is necessary to learn about computers, software, and the internet and its advantages. 34 out of 42 professors explained that whichever is the project planned to improve the education of quality, they are usually linked to internet use.

Results also show that for every 22 students, there is one computer, and only 30% of the educational institutions of Chocó have internet access. On this respect, it is noticeable that the department of Chocó has only one internet service provider whose service is not sufficient to cover the totality of the rural areas.

On a positive note, it was observed that 92% of teachers consider that incorporating activities that promote active learning allow to guide the students for autonomous and effective learning. On the contrary, only one teacher indicated that support activities based on the internet would allow to reach learning goals.

In the analysis with teachers regarding their knowledge and management of technological tools, it was found that they have a high interest in the development of learning environments to enhance their educational tasks. They also, manifested not having knowledge and skills in the

management of ICT. Moreover, they argue they do not have much time left to be involved in these activities.

One of the inadequacies noted at this stage was the use of online tools, which represented a cornerstone in the development of this project as it will raise the quality of education because many of the isolated communities lack of adequate connectivity or do not possess it. Teachers noted that it is very difficult to organize work schedules that match with all teachers since they are not willing to dedicate additional hours for collaborate working or ICT training. On this regard, only 35% of teachers were able to achieve a favorable performance in the use of some ICT tools in the classroom, but most professors do not have the necessary tools for the development of an efficient educational activity.

Teachers report that before teaching through ICT, it is necessary to know more about the use of the computer, software, the Internet and its scope. Younger teachers reflect more desire to learn and be trained in the use of ICT than an older professor. 80 % of interviewed teachers stated that projects or programs for the improvement of the quality of education should be linked to Internet because nowadays, the entire educational community expects improvement in this field, and in some places of the community the Internet connectivity is very poor.

Through the observations, it was identified that five science teachers incorporated Internet educational resources, a strategy that allows them to strengthen the content of their lessons and identify instruments opportunity to develop them.

Regarding the use of open educational resources, 70% of teachers agree to incorporate them into their practice. On the other side, 20% of participants mentioned they them scarcely, and only 10 % do not agree with its continuous implementation. As for the students, they considered that the use of complementary educational web resources create an environment of trust for the development of teaching-learning process.

CONCLUSION

The study of the educational setting and characteristics of a remote and isolated community allowed to obtain a perspective of how, in today's society, there is still much work to do regarding quality and equal education. In the isolated areas of Colombia, as in the department of Chocó, the advancements in technology are innovative project which implementation must be carried out with supervision and follow-up of the results, as suggested by Rogers (2003). All participants, including professors and students, agreed on the importance and prominence of the internet as a mean to expand and obtain knowledge, as signaled by De Haro (2005).

It is thought those technology aids that facilitate interactivity, which is vital for teaching and learning processes. In the case of the school of this research, located in a remote and isolated region, the most notable deficiency is the lack of technology equipment for the creation of new learning environments.

In Colombia, the growth in the telecommunications area is impending, the infrastructure in isolated areas is an obstacle to the educational advancement of the population. To reach the objectives of quality education in the school of this research, the following criteria must be followed: Training teachers for the use of ICT; Improving computer labs and infrastructure, Curriculum guidelines that support the teaching.

The majority of professors concluded that it is necessary to receive training and enhance the conditions of the computer room and connectivity. The training of teachers is a vital aspect in the

unification of ICT planning classroom, as they are influential in the formation of students. Teachers acknowledged that there are plenty of ideal tools to improve the development of classroom activities and optimize the teaching process, that should be adopted in the curricula of institutions and organization of activities. Concerning the teaching methodology, it was observed that teachers differ in the way they see the educational curriculum because they all have different ways to develop their study and lessons plans. Teachers stated that the design of a strategy that includes the development of ICT in the planning activities requires the assessment of the curriculum.

On the main topic of research: Is it necessary to develop an educational environment adapted only for remote and isolated communities? Is it possible to implement an established strategy? It was found that one of the most significant shortcomings is that the institution lacks much of technological elements that would facilitate the creation of new environments. Teachers, mostly elderly, fear of training to help them contribute to the development of new workspaces, forcing qualified teachers to seek to create learning environments. Otherwise, the chances are that traditional education is still being imposed in the same way as before, and a new work environment would not provide assurance to improve the educational quality of the institution.

The current infrastructure on campus does not seem to be the ideal. Building a successful virtual education model depends on the analysis applied as to the requirements needed to achieve it if it comes to infrastructure. The institution is then obliged to provide an ideal access for environments that are constructed so as to ensure rapid and efficient community connecting computers to work environments.

It is important to make a change to renew the way of teaching in campus, and a new teaching methodology is constructed, where students can learn as independently as possible, without cares and according to their needs from any workplace, not necessarily in the institution , where they can develop tasks to test their knowledge and acquire new learning that will motivate them to continue the path of knowledge and learning and contributes to reducing the population that chooses to walk away from the classroom.

Therefore, it is necessary to improve the technology investment and provide facilities for the use of the same, to ensure a chance of life, personal and cultural growth, allowing our students to grow in the use of new information technologies and communication, contributing to the improvement of digital literacy in the region.

It is necessary to structure in an orderly manner the project of creation and implementation of new environments, according to inputs that exist within the institution and the budget, to maintaining the quality of education that develops there, or what is more ideal, improve it. Campuses must conduct studies regarding the financial situation and make the decision that best favors on creating virtual learning environments.

The study concludes that the global interest in the scope and benefits that the internet can provide, is immense. Education has been sheltered by all the favors offered by the Internet, the facilities provided by both the teachers and the students for their learning, its interactive way of working and independent learning. However, we cannot forget that the Internet alone does not solve the problems of education, it needs a pedagogical model that fits and enjoy its scope, and provide isolated communities with an opportunity to improve education quality.

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