Virtual Educational Model for Remote Communities in Chocó, Colombia

Abstract

This research seeks to propose an analysis and solution to support classroom-based teaching through the implementation of a Virtual Learning Environments and Open Educational Resources in isolated areas of Colombia, especially in the Department of Chocó. Due to the disparities in the different regions in the country, the education sector is forced to look for work environments that show a greater benefit and favor isolated communities with delayed development. The participant of this study were the teachers, students, parents, and educational figures of the school. To give the opportunity to other forms of learning allows to create new pillars in the communities where traditional classroom education is efficient.

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

Introduction

Education in rural and remote contexts has been a subject of study and concern for Human Rights Organizations around the world. Colombia is country with around 48 millions of people; in the year 2014, they registered 28.5% of the population who lives in poverty in the, and 8.1% in extreme poverty (El Universal, 2015). The Finance Minister expressed in the Leadership Summit (Semana, 2015) that, for fulfilling the goals of education in the country, it is necessary to take actions and plan solutions based on solidarity and engagement of the society. Authorities must envision effective programs and assign resources to achieve the established goals.

Ramírez (2015) sustains that the advances in technology relate to education and its accessibility; in the international scenario, there have been numerous proposals that promote open access to education through information technologies and the communication through Internet resources. As an example of the mentioned above, we can mention the OpenCourse Ware, MERLOT, and OpenLearn from United Kingdom University, programs that aim to connect and provide different digital resources.

The term Virtual Learning Environment (VLE) is a broad concept that comprises the use of a virtual space with the purpose of promoting social interaction and achieve educational goals (Dillenbourg, Schneider, and Synteta, 2002). According to the authors, VLEs are no exclusive for distance education, as they can also be a convenient resource for classroom activities. VLE offer efficient services since its 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. De Haro (2005) mentions that the Internet has helped effectively and efficiently to improve the educational processes, as exposed in the different proposals and projects that are based on information and communication technology.

The model of education has found an ally in technology, Open Educational Resources (OER) and virtual learning environments. 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 can 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. Garcia (2003), supports the growth of this kind of networks, and emphasizes the advantages of data processing speed and storage capacity.

In distance education, many alternatives have proposed to promote change 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. 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 in this type of education is that virtual education is not completely effective for all kinds of people since some students come from different cultures and countries. López (2006), suggests that learning can be received in a practical and functional way. As a strategy to achieve effective learning, the modules and units contained in the online course

must be structured and accessible for use and understanding. Another belief is that distance education is of low quality, due to the lack of reviewers that assure the appropriateness of the materials. On this regard, Salazar (2000) expresses that there is a need to consolidate an academic community for the veracity 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 could 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, it must take into account two important aspects: The first, education can be developed in different forms and scenarios because not all contexts have the same requirements. The second aspect to take into account is that 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 than those involved in 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 this mode (teachers) are as valuable as the users (customers/students). Training is an ongoing process, and teachers require spaces to strengthen and develop their knowledge, which is shown in the teaching practice. Continuous teacher training goes hand in hand with curriculum models offered in educational establishments where they are working.

The incorporation of communications technology do not instantly solve problems of information access in remote or isolated communities, but as people start to use them properly, technologies will become a beneficial tool for the development of the population. It is expected that 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. Some of the reasons of global imbalance and the digital divide .

According to Suárez, Gargallo, Torrecilla, Marín, Morant and Díaz (2015), the term digital divide has been referred to as one of the negative impacts of technology in the different areas of society. There is a difference between those who access and use productively the information technology and telecommunications, and those who cannot access either. Ojeda (2005), shows how many 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.

Many public educational institutions of Latin American countries do not have enough facilities or optimal infrastructure to allow the construction of a good education. Several school buildings that are located in marginal areas or in very remote or rural areas, are in precarious situations, institutions that are not benefited by particular investment projects and would cost much to remedy the deterioration first they were exposed.

Research problem

To monitor the benefits that Internet offers for education, this research aimed to 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 on the school.

As for the teachers working on campus, they do not have knowledge of VLE nor handled OER, which requires technological appropriation for its pedagogical use. Therefore, the main research question was: What are the guidelines of pedagogical quality for building a virtual educational course for high school students in an isolated community?

From the above, a second concern arises: Is it necessary to develop an educational environment adapted for isolated communities? To integrate VLE in the educational institution, involving clear pedagogical guidelines in their construction, will encourage the high school students encourage their study, where you can work at their speed of learning, including the form, time and pace that the student's suits and 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.

Sample and participants

The study sought to integrate members of the educational community in a 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.

50 students of the 6^{th} and 7^{th} grade were randomly selected to participate in the inquiry. Also, 25 teachers from different areas were included, as well as the director of the campus. One representative of the parents committee and the psychologist of the school were also part of the study. Given the number of subjects and levels on campus, it was decided to start with a population comprised of students from 6^{th} and 7^{th} grade.

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 to create digital books or classroom activities.

Research method

An analysis was conducted regarding the academic performance of students 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 school in the isolated, which allowed an inductive logical analysis (qualitative) and deductive logic (quantitative).

For the quantitative part of the analysis, the student's academic results of the recent years were collected, showing the situation of the school. For the qualitative approach, a checklist was used to determine the relationship between the use and control of Internet educational resources and the content of the curriculum in the school. The survey allowed

to evaluate the perception of the students regarding learning through the internet. A survey for teachers was applied to determine the use frequency of web resources.

The teachers of the institution answered two instruments. The first interview with a group of 5 teachers and school psychologist, comprised of 12 open questions, which generated information about the research problem. The second instrument was a survey about the use and management of information technology and communications, in order to know their level of knowledge, acceptability or otherwise in managing virtual environments and training 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 allow to solve a problem, ensuring the generation of knowledge.

Results

The following section comprises the results of the research process. First, the context and educational status of Colombia was analyzed. Following with the analysis, we continue with the description of the obtained data from the two instruments mentioned above, about the student's and teacher's opinion.

Education in Colombia

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 distributed in preschool, primary school, and middle school, in the percentage of 7%, 74% and 19%, respectively. It is observed that the number of enrolled students diminish drastically in middle school, denoting high rates of desertion. The motives for

desertion are poor grades, low self-esteem, school quality and the availability to work, according to Jordan, Kostandini and Mykerezi (2012). Moreover, the authors point out a significant difference between dropout rates in rural and urban communities.

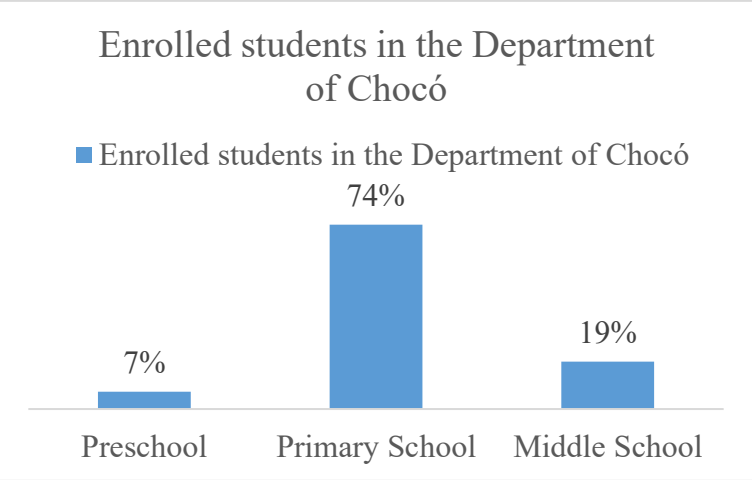

Figure 1. Percentage of enrolled students from preschool to middle school.

In Colombia, many top-level educational institutions have integrated into their work plans the inclusion of ICT for academic development. Opposed to the institution that was evaluated in this research, the proposal for ICT integration to the pedagogical models is a project that was planned, but the process has not been employed yet.

Technology use in students

The following tables show the results of the questions asked to the students: 1) perception of 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
Perception about the internet in students

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

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 internet be a resourceful tool for supporting teaching and knowledge difussion?	*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 for 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. The following table 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 vast majority that did not opinon on the topic of technology integration. Participant professors commented that most communities in Chocó do not possess quality connectivity or the necessary infrastructure to carry out this type of project at their schools.

In relation to the positive effects of teacher training for the use of ICT, it was observed that there were difficulties due to complicated schedule, they expressed that the majority of professor 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 to 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.

Moreover, in the Department of Chocó it is highlighted as a difficulty that most of the population do not have access to the internet and some areas lack of the electricity service.

One of the main concerns in the analysis of these results 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.

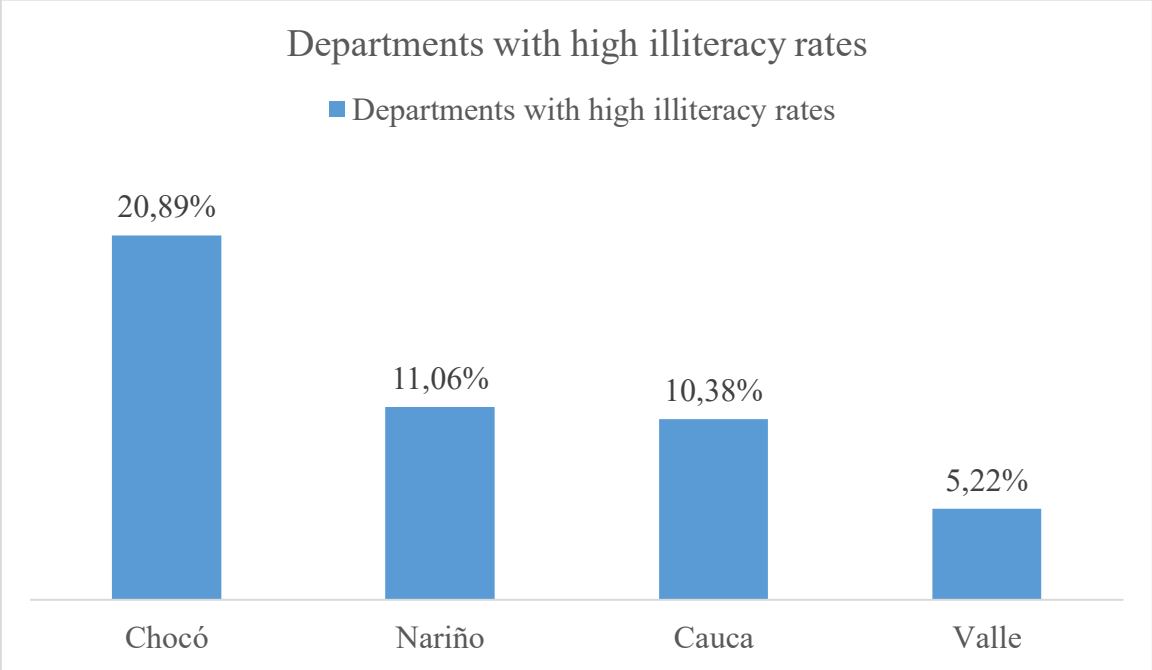

Figure 2. Illiteracy rates in some departments of Colombia.

Another emerging aspects is the analysis of poverty rates in Chocó, compared to other departments in Colombia. Although there is economical 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 contrast to the national numbers where it is stated that the poverty rates have decreased (El Universal, 2015). Figure 3 shows the comparison between poverty in Chocó and at national level in the years 2011-2012.

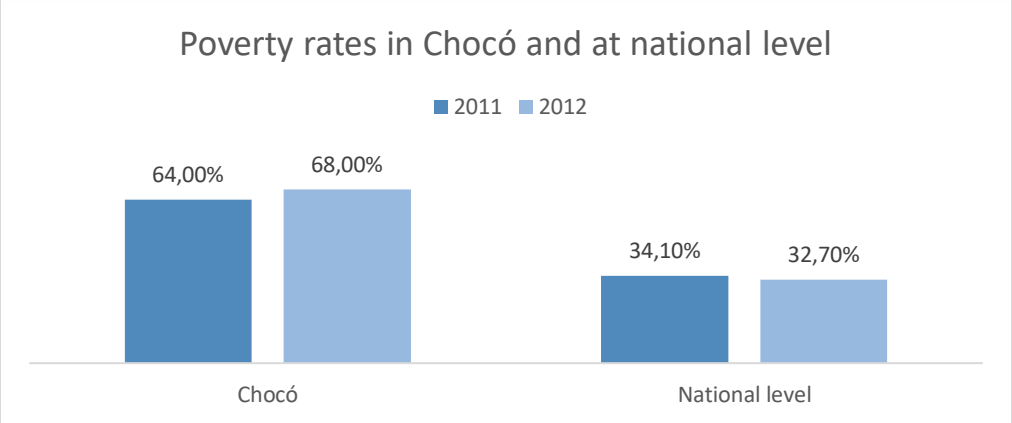

Figure 3. Poverty rates in Chocó and Colombia

Regarding the most frequently used tools, results 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 he 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 in relation to the pedagogy in the classroom, 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 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 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 the few places of the community with Internet, the connectivity is very poor.

Through the observations, it was identified that 5 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 to their practice. On the other side, 20% of participants believe they are not continuously used and only 10 % do not agree with its continuous implementation. As for the students, the totality of them 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 that technology aids to 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 for 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. With regard to 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.

With respect to 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?

After a prolonged research, 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, 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 on campus and a new teaching methodology where students can learn independently as possible, without cares and according to your needs from any workplace is constructed, not necessarily in the institution , where they can develop their tasks to test their knowledge and acquire new learning that will motivate them to continue on the path of knowledge and learning and contributes to reducing unmet population demand 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, ideal for no longer contributing to the sinking of digital illiteracy in the region motive.

It is vitally necessary to structure an orderly manner the project of creation and implementation of new environments, according to inputs that exist within the institution and the budget that is determined to assign, to ensure at least not impair the model current educational, or alternatively, 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 interest is born into the world by the scope and benefits that can provide the internet is immense, and the educational community however distant is located, is no stranger to rumors of wealth that can be achieved if it were available. Education has been sheltered by all the favors offered by the Internet, the facilities provided by both the teacher and the student in his learning, his work interactively and independent learning. However, we cannot forget that the Internet alone does not solve the problems of education, 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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