Virtual Environments In The Framework Of The Development Of Competences In The Processes Of Social Bonding In Higher Education In Ecuador

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Abstract: Virtual environments have generated unlimited opportunities in Higher Education, many of which have yet to be explored. We propose an investigation to rescue programs that in their time had a significant impact on Ecuadorian society. The objective of this study is to study the incorporation of the Popular Radio Schools of Ecuador, through virtual environments as a teaching and learning mechanism. The study is within the framework of the development of competencies in the processes of social linking of the National University of Chimborazo. The methodology was multi-method. The study design was documentary and interpretative. An interview to specialists and a survey to 95 teachers were applied. The results showed that there is a possibility of incorporating the Foundation's Popular Radio Schools of Ecuador programs through the UNACH's social linkage processes. The incorporation is developed through new technological trends. In conclusion, it is stated that incorporation can have a great impact on reducing illiteracy rates. The proposal can also be developed in favors of the community, considering diminishing the gaps of low or absent accessibility. All due to the digital divide in rural areas of Ecuador.

Keywords: Competences; Higher Education; Social Linking; Virtual Environments.

Introduction

The research presented here focuses on the importance of virtual environments. They can be presented as mechanisms in educational processes. During the COVID-19 pandemic, they served as support during the emergency. Nowadays, there is a need for them to form part of current educational methodologies. Technology facilitates teaching and learning and has a positive impact on the community. However, this situation has revealed digital inequalities in terms of connectivity and accessibility (Gómez and Mamani, 2021).

In this sense, different advances have been generated over time in the educational area. The possibilities of technology and the incorporation of media, techniques and instruments of mass communication (television, radio, cinema) have been demonstrated. Technology strengthens and makes important educational changes that have a great impact on society. Such is the case of the production of radio programmers for literacy in Ecuador. In the 1970s, these were called Popular Radio Schools of Ecuador (PRSE).

In the first stage, these schools enabled 18,000 elderly people in rural areas of Ecuador to learn to read and write. The radio broadcasted the programmers, and this modality became an opportunity for social change (PRSE, 2021).

This literacy initiative favored indigenous people and peasants. This population had difficulties in accessing formal education. In the 1960s and 1970s, the illiteracy rate reached 32.5%. In 1974 Ecuador was between 26% and 17% illiteracy in 1982. Then Ecuador was at 12% in 1990 according to the United Nations Educational, Scientific and Cultural Organization (2009), UNESCO.

However, the current illiteracy rate in the rural area of Chimborazo (Ecuador) is 25.37%. At the national level it is 13.65% for the year 2019. According to figures from the National Council for Intergenerational Equality in its evaluation of the period 2017 to 2020, the indigenous sector has the highest illiteracy rate.

The literacy process within the context of the evolution of distance education can be placed within the second generation according to Arboleda and Rama, (2013). Radio schools can be structured as Audiovisual education (with the integration of audio and video). The social impact that it caused at the time can serve to generate greater benefits, taking into consideration the massification of current technologies.

It is for this reason that the general objective is to study the incorporation of the PRSE, through virtual environments as a teaching and learning mechanism, in the framework of the development of competencies in the processes of social linkage of the National University of Chimborazo (UNACH), in the Riobamba canton of Ecuador. In consideration of the relevance and presence of the impact that universities have in the social context, promoting change and support for communities.

In accordance with Article 8 of the Organic Law of Higher Education of Ecuador (2010) (LOES), it is expressed that within the purposes of Higher Education should:

(a) Contribute to the development of universal thought, to the deployment of scientific production and the promotion of technological transfers and innovations.

h) Contribute to local and national development on a permanent basis, through community work or university extension" (p.11).

Likewise, Article 126 clearly states that "The institutions of the Higher Education System will carry out programmers and courses of linkage with society guided by the academic staff" (p. 46). In these terms, the PRSE are working on AM and FM frequencies. Radio schools are managed in six provinces and their respective cantons. Particularly in Tungurahua, Bolivar, Cotopaxi, Chimborazo, Cañar and Pastaza. Amplitude Modulation (AM) distribution is applied in the indigenous, peasant and mestizo sectors. Frequency Modulation (FM) for marginalized cantons in the province of Chimborazo (Fundación ERPE, 2021).

The project succeeded in making indigenous people and peasants in 13 provinces of Ecuador literate. This may represent an enlightening opportunity to use information and communication technologies (ICTs). These tools and mechanisms of mass dissemination can be combined with educational techniques. In this way, radio programmers can be used to improve literacy.

Currently, there are significant inequalities in accessibility to information, which means that social linkage mechanisms must necessarily be adopted. The use of ICTs and the experience of impact programmers can reduce the existing digital divide (Martínez, 2021). For this reason, it is considered of the utmost importance to present a study that makes these comparisons visible and seeks favorable alternatives. To this end, some theoretical aspects to be considered that are relevant to the research presented here are mentioned.

Literature Review

Virtual learning environments

Virtual Learning Environments (VLE) have become an indispensable tool in teaching processes in higher education (Lorente et al., 2020). Virtual Learning Environment (VLE) and/or Learning Management System (LMS), are computer applications developed to serve as a platform for virtual and distance teaching-learning processes (Yorulmaz, 2022). They can be said to represent a classroom, but virtual, they are intangible and use communication

tools and technologies (EUROINNOVA, 2020).

Moodle platforms are considered the most widespread VLEs on the market, as they are widely used, open source or free of charge. Among the advantages of using an EVA, mainly, is the ease of interaction and communication, also the flexibility and availability of the tool (Moreno & Marín, 2022). Also, the tools in these environments are designed to stimulate learning through didactic content that reinforces all the senses (Mahboubeh et al., 2022). Table 1 briefly describes the types of VLEs.

Table 1. Types of Virtual Learning Environments

Types of virtual learning environments	Description
e-Learning platforms	It is a complete virtual environment, complex in terms of its structure and number of tools, resources and interactivity available. Normally made up of a variety of software that allow various functionalities, and large-scale mass access.
Blogs	It is an environment specialized in different topics, where you can give your opinion and debate, they normally serve as a basis for virtual teaching practices.
Wikis	They are web pages, where the content is a collaborative creation
Social networks	It is an environment that connects countless users around the world to share content, interact and exchange knowledge around a specific topic.

Commercial platforms include WebCT or Blackboard, First Class and e-College. There are also open-source platforms such as: ATutor, Chamilo, Claroline, Docebo, Dokeos, LRN, FLE3, Moodle, Olat, Sakai (Arredondo, 2022). In the case of UNACH Virtual, it is an e-learning platform that has resources such as: Sicoa, admission, virtual classrooms, library, virtual library, urkund, student welfare, linkage, IFTH, Zoom, Tele linkage, postgraduate scholarships, email, human talent, infrastructure, medical centre, research, evaluates, UPR, application and results. Likewise, each division contains resources and interactive technological tools that streamline educational management processes, both administrative, teaching and student.

Competence development in virtual learning environments and social networking

It is clear that important changes are currently being generated at the educational, economic and social levels as a result of the knowledge society and the incorporation of technologies in all areas. Cejas, et al, (2020), state that digital competences are an element that contributes significantly to the development of self-learning and, to a large extent, are also tools that allow for increasing scientific knowledge capital, promoting the effective and efficient use of digital resources.

Likewise, Pizá, et al, (2010) express that, with distance education, the need for the development of new competences is imminent. Also necessary are multifaceted teaching materials and a new curriculum that supports the competences that the student must develop. These tools contribute to successful entry into the workplace (Pokhrel & Chhetri, 2021). This in the context of the formal university environment, for those who are attached to it. However, Cejas, et al, (2020), state that a study conducted over the last five years shows that approximately 50% of the population between 5 and 19 years of age in Latin American countries is outside the education system.

This is mainly because many of them fall within the segments of the population that are below the poverty line. This intensifies the consequences of low and absent professional preparation. The development of hard and soft skills is basically an opportunity to form a particular view of the world. An opportunity to

live with the diverse interpretations offered by the information age and the knowledge society (Barrot, et al., 2021).

In this sense, competences can be measured and demonstrated, as they are defined by the set of knowledge, skills and abilities (Mendoza et al., 2021). Competences make the exercise of professional activity or performance visible. For university institutions, competences are as much a part of those who work there as of the students (Capinding, 2022).

Likewise, the massive incorporation of virtual distance education that is taking place in Ecuadorian universities. Virtual education has provided the opportunity to observe various possibilities, particularly in terms of the processes of linking with society. The impact can be produced in the development and rescue of programmers that favors the competences of the communities. This opportunity is also in favors of young people who do not have the possibility to enter the formal system (Nur & Muzirah, 2022).

In the Manual of Social Responsibility and Good Practices of Linking with Society of the National University of Chimborazo (2017), we find the linking processes. The first corresponds to the professional training process and the way in which young people relate to society through community service. This contributes to solving problems and needs (UNACH, 2017).

The second links the university through its actions and activities. This link directly influences the future of society by training professionals through interdisciplinarity. It turns citizens into participants with the social actors. These future professionals must have the necessary competences to carry out their functions (UNACH, 2017). Similarly, linkage actions are derived from the substantive activities of teaching, research and social action. When combined, these areas contribute to the desired social impact. This impact is a relationship where UNACH collaborates with the solution of society's problems and provides feedback to the academy (UNACH, 2017).

At present, the contribution that virtual distance learning environments can offer resources to emphasize and increase the development of education (İlic, 2022). ICT can facilitate development not only in universities, but also in communities (Spitzer & Musslick, 2021). Figure 1 details the social networking process present at UNACH.

Figure 1 - UNACH social link practices, adapted by the Authors (2022), from the Manual of Social Responsibility and Good Practices for Linking with Society of the National University of Chimborazo (2017)

In this sense, virtual environments can help to rescue programmers such as the PRSE. These schools generated important social advances with a significant impact. As can be seen in Figure 1, the purpose is the satisfaction of the community. Satisfaction through the organization of linkages, cooperation and development, continuing education, social and productive entrepreneurship, pre-professional internships and community service.

Methodology

Research Design

The research is based on a mixed approach. This allowed the authors to take a holistic perspective through documentary and field review techniques. Mixed studies are part of a broad and in-depth view of the object of study (Cantor, 2002). This approach also made it possible to clarify ideas through observation and evaluation of phenomena. The mixed method demonstrates its fundamentals by combining the deductive-inductive method.

The mixed approach is proposed through a process that analyses and links field and measurable data as well as documentary, descriptive and analytical data from collected information. In this research the qualitative approach underpins the depth of information, dispersion and richness of interpretation. The quantitative approach provides the opportunity to generalize measured results from the numerical data provided in situ.

Objective of the research

The general objective was to study the incorporation of the Popular Radio Schools of Ecuador, through virtual environments as a teaching and learning mechanism, in the framework of the development of competencies in the processes of social bonding of the National University of Chimborazo, in the Riobamba canton of Ecuador.

Type of research

The type of research is descriptive explanatory. The variables were characterized and described in the environment and nature in which they were developed, without interfering with or influencing them. For the development of the study, it was necessary to know in what way virtual environments as a cause can favors the processes of social bonding. The environments, in particular the incorporation of programmers such as the PRSE consequently and/or effect.

Population and sample

The sample was arranged as simple random sampling, where subjects and objects had the same probability of being chosen or the same probability of being selected (Sabino, 2014). For this purpose, the strata for the information and documentary analysis were considered. The data corresponding to the field or on-site research was also considered, as described in the following table 2:

Table 2. Population and collective sample and institutional documents

Stratum	Population	Proportion	Proportional sample
Documentary Collection Diocese of Riobamba	32 scripts	50%	16 scripts
Sound Library Popular Radio Schools of Ecuador	10 programs	70%	7 programs
Specialists	Teachers National University of Chimborazo and the Pontifical Catholic University of Ecuador	100%	2 Specialist teachers
Teachers in processes of linking with society	171 Teachers National University of Chimborazo (2018)	56%	95 Teachers in internships in connection with society

Information and/or data collection instruments

Several techniques were used, including documentary research. As an instrument, a survey of bibliographical sources was carried out for the documentary review of books, theses, articles and archives of the institutions involved. This made it possible to provide theoretical and analytical support for the

research, as well as to obtain information from the archives.

An interview was also conducted. The interview was semi-structured, which made it possible to obtain information from specialist teachers. The field research technique was also used, which was a 15-question survey. The survey was addressed to teachers who were involved in the UNACH's social linkage processes. Relevant data was obtained from the survey to support the documentary review carried out.

Results

Qualitative analysis

In the documentary and archival review, the organizational structure of the Radiophonic Schools was found. The organization consisted of a general coordination, with the support of bilingual magazines influential in intercultural education (Quilumba, 2020). A semantic map detailing the organization of the PRSE is presented in Figure 2.
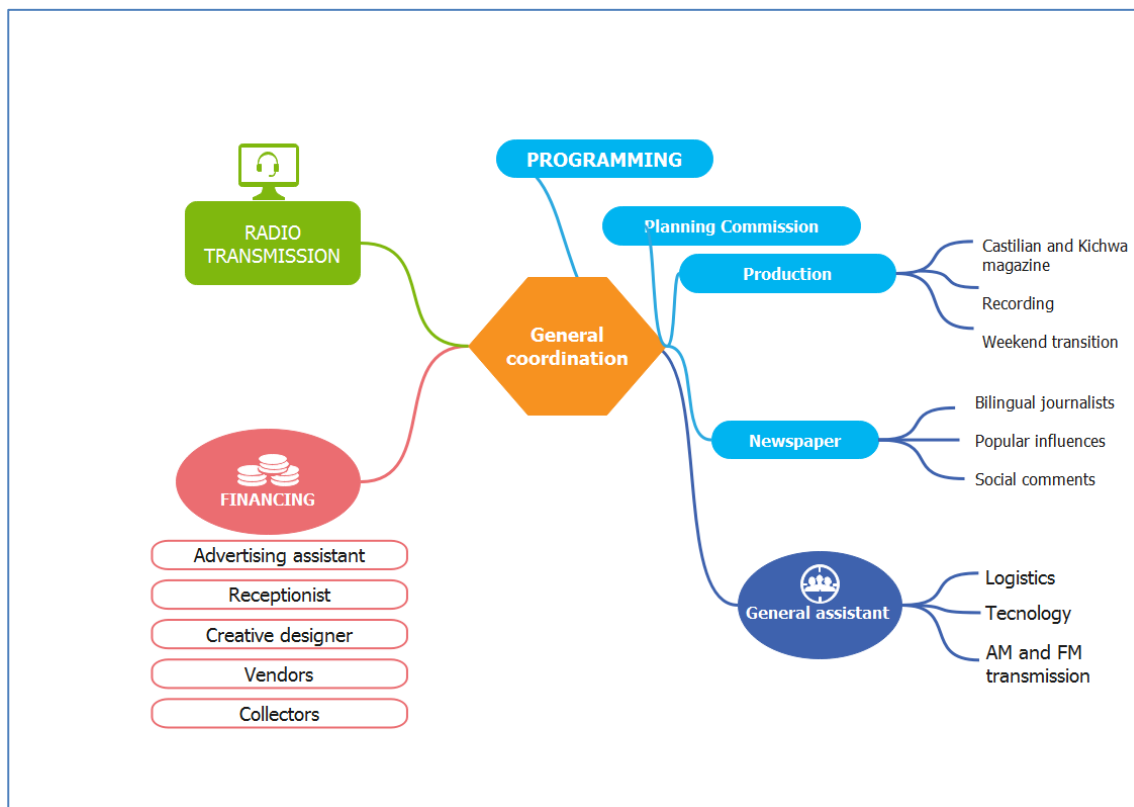

Figure 2. Semantic map of the organizational structure of the PRSE, adaptation of the Authors (2022), from (Quilumba, 2020)

Under this structure, school programming was presented on AM: 710 KHZ. Eighteen hours of programming were provided from 16.00 to 22.00 hours. Bilingual programmers were presented in Kichwa, such as agriculture, health, evangelization, other informative programmers in Spanish, with topics in nutrition, economy and legislation, as well as intercultural programmers for young people. On the FM frequency (FM: 91.7 MHZ), 17 hours of programming were provided. The topics were in Spanish with respect to democracy,

traditional music, participation with gender and family issues (PRSE, 2021).

In this sense, PRSE supported educational processes with respect for the cultural identity of the most disadvantaged (indigenous and peasants). Cultural identity safeguards customs and traditions but makes a significant formative contribution. This allowed them to improve their lives and their environment. The radio classes had five moments - the first was the agenda of the learning to be shared, it clarified the panorama of what would be done. The second was motivation, which was an important moment because the scriptwriter and the announcers sought to get the learners interested in the content. Motivation invoked collective transformation, not individual transformation.

The third moment was the feedback that analyzed the previous classes and resolved concerns.

Then the fourth moment was the explanation of the class. It was of a comparative type, using objects from the environment to build familiarity and strengthen the subjects. For example, in mathematics, rows of eucalyptus trees, typical of the highlands of the province of Chimborazo, were named to teach multiplication. The fifth moment was the closing moment, when the contents were reviewed and the next radio education meeting was planned.

As a contribution of this research, it became evident that the classes were framed within the constructivist paradigm. They were supported by the auxiliary educational process, in parish halls, churches and homes. The environments were the link between the programmers and the pupils who practiced the contents of the programmers on the primers or cards at the time of transmission.

Under this educational process of the PRSE, the development of competencies was being structured. From the community or social service, the following table describes some of the subjects, their thematic axes and some of the generic competences that the community had to develop. Radio listeners developed educational activities through the programming (view table 3).

Table 3. Some generic skills developed by the community in Radio Schools

Course	Main theme	Competencies
Math	Basic operations Addition Subtraction Multiplication Division	Ability to apply knowledge in practice Ability to identify, formulate and solve problems
Bilingual Kichwa and Spanish	The vowels The consonants the grammatical sentence the score The accents	Oral and written communication skills Ability to learn and update Appreciation and respect for multiculturalism
Other themes	Agroecology Environmental Sanitation Urbanity Home formation Evangelism	Commitment to the socio-cultural environment Commitment to preserving the environment Bilingual communication skills

The progress achieved in the PRSE, with the support of virtual learning environment technologies or platforms, through the processes of social linkage, can be studied as an alternative. An alternative to increase the development of competencies in the most vulnerable communities. As explained above, the illiteracy rate, although it has decreased, has not been completely eradicated. In view of this assertion, an interview was developed under three dimensions. The education-communication dimension, synergy contributions and dissemination of knowledge. The two specialist teachers formulated their opinions, which are presented in figure 3 below.
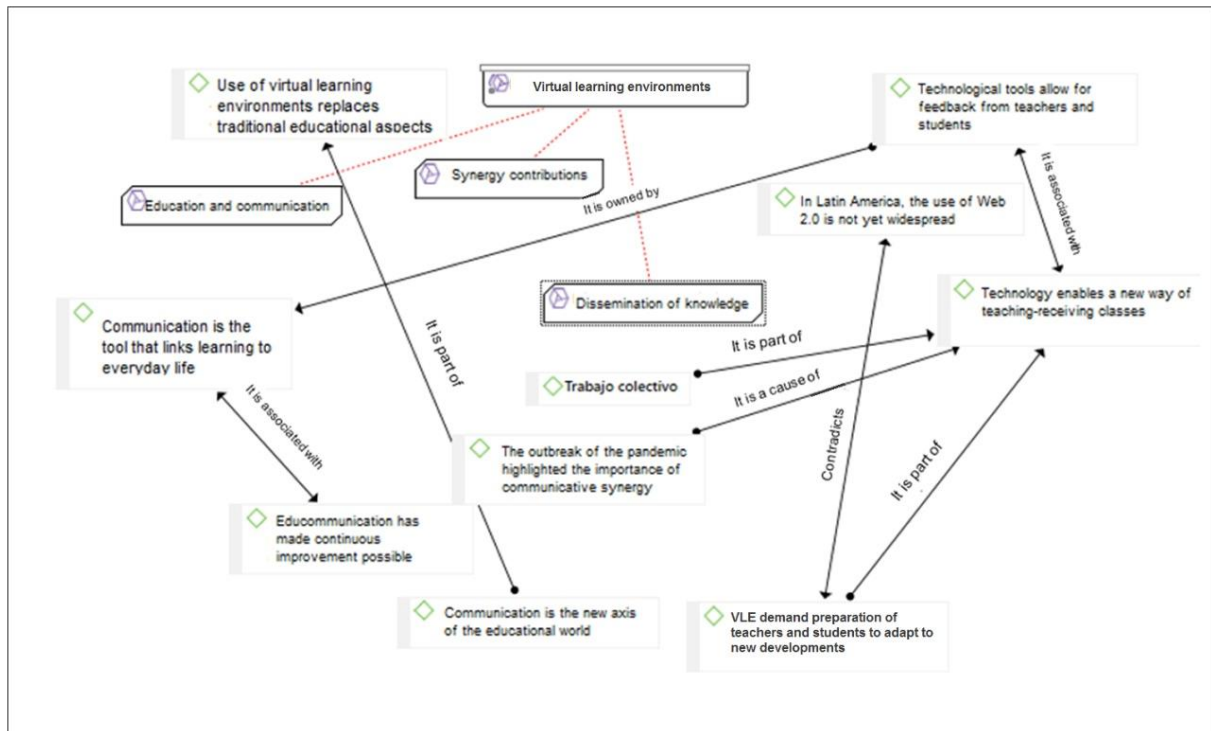
Figure 3. Semantic network interviews with specialist teachers about virtual learning environments

As can be seen, in the Education and Communication dimension, the specialists agree that communication is the tool that links learning. This linkage is found in everyday life, so that students will be aware of the importance of working collectively. The pandemic crisis provided a different vision of a new educational world where communication is the focus (Singh et al., 2021).

In the Contribution of synergy dimension, the use of virtual learning environments replaces traditional educational aspects. This demonstrates the readiness of students and teachers to adapt to the novelty. The outbreak of the pandemic demonstrated the synergy of communication (Mendoza & Salvador, 2022). Likewise, in the Knowledge Dissemination dimension, they state that the EVAs allow knowledge to be transferred automatically. This knowledge is fed back to students and teachers. The latter ceased to be the owner of the truth, as technology makes educational processes possible through the inverse classroom (Madriz & Mendoza, 2018).

Based on quantitative analyses
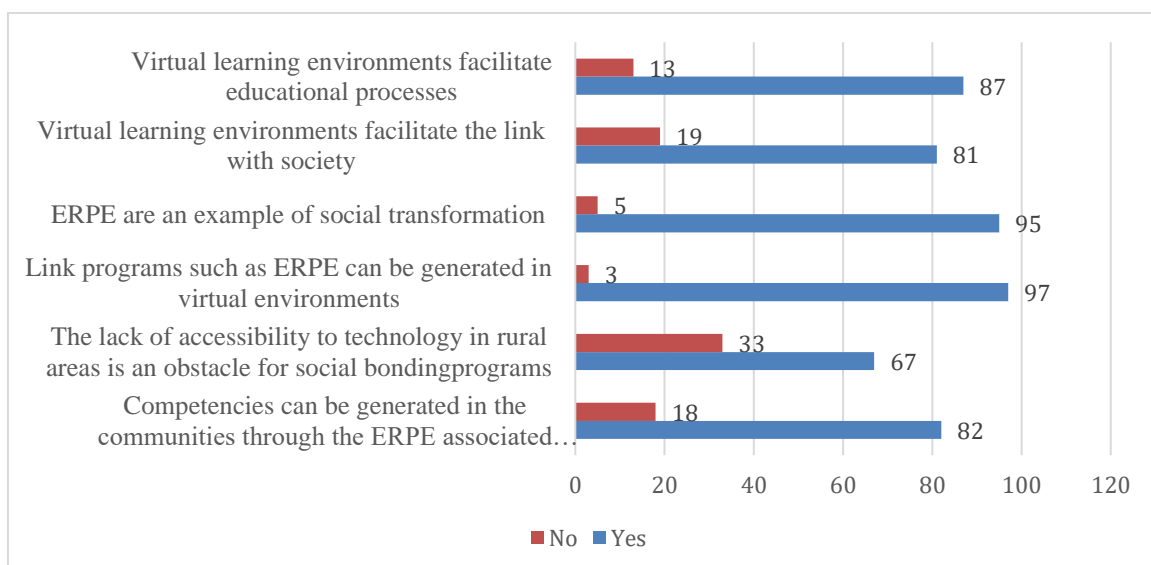
Figure 4. Results of the survey of teachers

In figure 4, among the results, 87% of UNACH teachers associated with the social linkage processes agree that virtual learning environments facilitate educational processes. Also, 81% affirmed that virtual learning environments facilitate the link with society. 95% agreed that the PRSE are an example of social transformation. Ninety-seven per cent agree that these programmers can be generated in virtual learning environments.

On the other hand, 67% think that the lack of accessibility to technology in rural areas is an obstacle to social outreach programs. 82% affirmed that competences can be generated in communities through VLEs associated with virtual learning environments, even with the accessibility obstacles.

Conclusions

It can be concluded that even though PRSE was a social initiative, as an educational programmed, it had an effective training structure. The structure was endowed with a professional radio language management, starting from elements such as voice (male and female speakers, dialogue, seriousness, formality), sounds (backgrounds, curtains, interpretations, effects) and silence (pauses as transition, pauses to emphasize aspects of the class).

The structure of the classes was managed in different phases:

1.- Agenda of the day, which was the explanation of the class set-up.

2.- Motivation, with an invocation to recognize the reality in which they were living and how education can build change.

3.- Feedback, corresponding to a review of the contents developed during the previous class to measure learning.

4.- Explanation of the class, an exposition of the planned subject matter, using elements from the environment to improve understanding.

Closure, which was a brief review of what had been learned and an invitation to the next meeting.

These basic and simple but effective aspects succeeded in making more than 18,000 indigenous people and peasants in approximately 13 provinces of Ecuador literate. The organizational structure of the PRSE was based on the current effective education system.

Specialist teachers and teachers linked to social processes indicate the advantages of using VAS to rescue and incorporate programmers such as the PRSE into the UNACH social linkage processes, using new technological trends and virtual learning environment platforms.

Radio schools can be considered innovative teaching strategies. They can facilitate the development of generic competences in community learners. The formative process is found if there is a personal commitment of educators and learners to learn and share knowledge with all members of the educational community. If this were achieved, the radio school could become a powerful educational resource. A resource as a space for learning and communicating ideas, dreams, knowledge and experiences that could improve the world in which the next generations will live. This resource can bridge the gaps in accessibility to computer and internet equipment that often exist in rural areas. However, most of them have telephone equipment, which can serve as an alternative for training and education.

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