Technological Education in Post-Conflict Colombia: Characteristics and Challenges to be Met

Loreley Mejía González
Universidad de la Guajira, Colombia

Hugo Hernandez Palma
Universidad del Atlántico, Colombia

Bertha Orozco Daza
Universidad de la Guajira, Colombia

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Abstract

The importance of Information and Communication Technologies (ICT) for all levels of education is undeniable, since to a large extent the expected results in this area are articulated with variables such as innovation, creativity and research, which are favored when they are mediated by technologies. With the purpose of reflecting on the contributions that ICT can generate for education processes in Colombia, in the post-conflict stage, the results of a qualitative research that analyzed the different approaches that are currently suggested to incorporate ICT in the educational field are presented below. The final results allow us to understand the methodologies to be followed so that the transition to virtual education environments can be carried out gradually.

Keywords: information and communication technologies (ICT), education, innovation, post-conflict, quality
1 Introduction

Colombia is writing a new phase with the end of an internal conflict that lasted for more than 50 years. This new reality means new challenges and demands for all the state spheres of the territory, since many people and their families are now returning to various regions of the country, which will make it necessary to adjust the current action plans in order to insert this population into the various training programmes [1]. Thus, one of the great challenges for educational environments, especially those located in rural areas, is the issue of ICT [2]. Recent governments have resolutely invested in equipment, platforms and technological tools, but much work remains to be done in this regard [3].

In reviewing recent research, it is found that the insertion of ICT into educational environments involves all actors and requires structured steps to be followed for long-term results to be sustainable [4]. In this way, the results of a review of ICT insertion experiences are presented below, compiling the most outstanding aspects to be considered in order to facilitate a transition from traditional educational settings to current virtual and training environments, especially in rural areas [5] which must be accompanied by innovation, creativity, scientific research and quality in order to achieve levels of competitiveness [6]. The results of this analysis are presented in the form of graphs and tables, as they are intended to provide a tool that is easy to understand for all actors or parties of interest in the Colombian educational sphere.

2 Methodology

To achieve a rigorous approach to the subject, it was decided to apply a qualitative/reflective methodology, based on the postulates proposed by Gutiérrez [7], which states that all socio-educational aspects should be analyzed under this paradigm, since it allows the integration of diverse elements that can be observed from a codification or interpretation system, facilitating the reflection and generation of ideas from the facts that are observed or investigated. On the other hand, authors such as Dávila and Dávila [8] have suggested that research based on reflections can contribute to the understanding of those aspects that at first glance are not valued. Thus, it is necessary to review both the theoretical aspects of the topic when carrying out social research with a focus on issues such as education [9], while at the same time making contrasts to generate new knowledge or approaches to a problem of interest [10]. Once the previous concepts had been revised, the research stages were designed and illustrated in figure 1.
The phases were chronological, beginning with the bibliographic review to take into account research and experiences of other countries in ICT issues. Once this information was verified, the information was selected, organized and tabulated, which allowed the most notable aspects to be captured and then compiled in the form of graphs and tables to make the information gathered more visual. The step-by-step process made it possible to reflect on the information gathered and to deepen those aspects aligned with the context of education in Colombia, facilitating the final reflections.

3 Results

The literature and the results of other ICT experiences were used to summarize the initial stages that must be considered in any form of traditional or virtual education in order to initiate a successful transition process. Thus, Figure 2 shows the steps proposed to initiate a process of migration to ICT that authors such as Lucke, Dunn and Christie [11] propose in order to promote the safe transit of traditional environments through ICTs in the medium of the media, with better results in the long term.
The suggested stages are part of a large number of publications, since similar aspects have been identified by researchers such as Esparza et al. [12] who, in search of ICT solutions for various cases, have investigated the processes to be followed in a sequential manner, arriving at scenarios where they have even designed applications for children with learning problems in mathematics. A similar case can be observed with the experience of Brazilian teachers who, during a training process in Portugal, managed to find an option for migration to ICTs in planning, socialization and continuous follow-up [13].

Continuing with the most notorious aspects, it was found in the review of experiences that training for stakeholders is a vital component; initial efforts should be made centrally by teachers, since they will be responsible for providing continuity to the programs that institutions provide [14]. Teacher education should not only focus on ICT aspects, it should also focus on the use of pedagogical techniques and content when developing ICT mediation [15], as these aspects can be essential for making significant progress. Likewise, officials, tutors and parents should also be trained if this is the case [16], since as long as the information is socialized, the ICT processes will have a solid platform to endure. The following figure 3 shows the parts of interest and the possible interactions that will be achieved in the ICT training processes [17].
Once the training of the actors has been completed and the needs identified according to the diagnostic stage have been met, the technical factors to be considered must be established, since they play a determining role in the results to be obtained [16]. Table 1 presents the technical elements with the basic characteristics that every institution must consider in order to carry out its migration process to ICT, thus achieving a notable advance in education, quality, competitiveness and innovation.

Table 1. Elementos técnicos para inserción de TIC

<table>
<thead>
<tr>
<th>Factor técnico</th>
<th>Factor (1-5)</th>
<th>Descripción</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Distributed system</td>
<td>3</td>
<td>A semi-distributed network is required for information management and internet connection.</td>
</tr>
<tr>
<td>2 Response time</td>
<td>4</td>
<td>The system must be quick to manage the interactions of the parties of interest.</td>
</tr>
<tr>
<td>3 Easy to use</td>
<td>3</td>
<td>The application should be very intuitive and user-friendly.</td>
</tr>
<tr>
<td>4 Portability</td>
<td>5</td>
<td>Verify the alternatives of the web applications so that the programs can be used in different platforms and not have to invest in later migrations of information.</td>
</tr>
<tr>
<td>5 Easy changeover</td>
<td>4</td>
<td>The system should be adaptable to changes in each institution.</td>
</tr>
<tr>
<td>6 Safety and security</td>
<td>4</td>
<td>The security apart from the user and access password, the information stored in the final destination must be reliable (cloud).</td>
</tr>
<tr>
<td>7 Ease of training</td>
<td>5</td>
<td>The application should be very simple, facilitating the training of the parties of interest.</td>
</tr>
</tbody>
</table>
In the technical part, seven essential aspects were selected, in which educational institutions can be supported to carry out their processes of migration to digital environments. These tools are basic and applicable to all types of institutions [17]. A number of authors have stated that in ICT issues, preference should be given to alternatives that have universal or easy-to-apply systems [18], since this facilitates long-term results and contributes to investment and cost issues [19]. Thus, these factors were categorized or assessed according to weight throughout the process on a scale of between 1 and 5; reflections based on the experiences of European countries [11] make it easier to indicate that the most important aspects are portability and ease of training [20], which may encourage future improvements. Similar weights play components such as system speed, adaptability and security [21] because, as there are several parts that will be integrated into the process, each one must be guaranteed the necessary conditions for the development of future activities [22].

4 Conclusions

For educational institutions in Colombia, post-conflict poses great challenges, since parallel to the processes of social insertion, new demands will also be developed in the search to meet the needs imposed by globalization in several areas. Educational institutions at all levels, concerned with issues such as innovation, competitiveness and quality, will need to migrate to ICT-enhanced scenarios to achieve more visible results and to forge equitable opportunities for all individuals. Migration to ICTs requires the participation of all actors in the institutions, which must be trained, but also requires technical aspects that must be managed. Therefore, every institution can apply the preliminary phases proposed, which are: diagnosis, planning, socialization and follow-up, because with it, progress can be measured and alternatives and improvements can be generated.

References


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