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Review article

Theoretical references for the visualization management of institutional websites of educational centers

Referentes teóricos para la gestión de la visualización de sitios web institucionales de centros educacionales

Referenciais teóricos para a gestão da visualização de sites institucionais de centros educacionais

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ABSTRACT

In the context of information and communication technologies, there are transformations in the form of social communication, imposing a new paradigm to spread the results that are generated in institutions from computer networks. A study carried out in this regard in Pinar del Río's educational centers reveals limitations when disclosing the services that are managed in them, causing a contradiction with the measurement indicator of the Ministry of Education with respect to the operation of the institutional websites of schools. This has led to determine the theoretical references for managing the visualization of institutional websites of educational centers. For this, theoretical methods were used: historical-logical, analytical-synthetic, inductive-deductive, modeling, systemic-structural-functional and systematization; that allowed to identify the management of the visualization of the websites from the computerization in terms of the use of technologies based on the services of society, the educational systems that establish the application of the legal and methodological provisions that govern the teaching process, among which are human resources, services to society through interactive platforms, management as a multi-stage process, institutional websites to achieve credibility and notoriety of the institution and interaction with users, as well as the visualization of the data so that they are accessible.

Keywords: computerization; display; websites; management.

RESUMEN

En el contexto de las Tecnologías de la Información y las Comunicaciones están existiendo transformaciones en la forma de

comunicación social, imponiendo un nuevo paradigma para divulgar los resultados que se generan en las instituciones a partir de las redes informáticas. Un estudio realizado al respecto en los centros educativos pinareños revela limitaciones al divulgarse los servicios que en ellos se gestionan, provocando una contradicción con el indicador de medida del Ministerio de Educación con respecto al funcionamiento de los sitios web institucionales de las escuelas. Esto ha llevado a determinar los referentes teóricos para la gestión de la visualización de los sitios web institucionales de los centros educacionales. Para ello se utilizaron métodos teóricos: histórico-lógico, analítico-sintético, inductivo-deductivo, modelación, sistémico-estructural-funcional y sistematización. Estos métodos permitieron identificar la gestión de la visualización de los sitios web, a partir de la informatización en cuanto a la utilización de las tecnologías en función de los servicios de la sociedad, los sistemas educativos que establecen la aplicación de las disposiciones legales y metodológicas que rigen el proceso docente; entre ellas se encuentran los recursos humanos, los servicios a la sociedad a través de plataformas interactivas, la gestión como un proceso de varias etapas, los sitios web institucionales para lograr credibilidad y notoriedad de la institución y la interacción con los usuarios, así como la visualización de los datos para que sean accesibles.

Palabras clave: informatización; visualización; sitios web; gestión.

RESUMO
No contexto das Tecnologias de Informação e Comunicação, ocorrem transformações na forma de comunicação social, impondo um novo paradigma para divulgar os resultados gerados nas instituições a partir das redes de computadores. Um estudo realizado a esse respeito em centros educacionais de Pinar del Río revela limitações na divulgação dos serviços que neles são administrados, causando uma contradição com o indicador de medição do Ministério da Educação quanto ao funcionamento dos sites institucionais das escolas. Isso levou a determinar os referenciais teóricos para a gestão da visualização de sites institucionais de centros educacionais. Para isso, foram utilizados os métodos teóricos: histórico-lógico, analítico-sintético, indutivo-dedutivo, modelagem, sistêmico-estrutural-funcional e sistematização. Esses métodos permitiram identificar a gestão da visualização dos sites, com base na informatização em termos de uso de tecnologias baseadas nos serviços da sociedade, os sistemas educacionais que estabelecem a aplicação das disposições legais e metodológicas que regem a processo de ensino; Entre eles estão recursos humanos, atendimento à sociedade por meio de plataformas interativas, gestão como processo multietapas, sites institucionais para conquistar credibilidade e notoriedade da instituição e interação com os usuários, além da visualização dos dados para que sejam acessíveis.

Palavras-chave: informatização; exibição; websites; gestão.

INTRODUCTION

In Cuba, the process of computerization of society has begun, based on work objective 52 of the Communist Party of Cuba, which indicates that it is necessary to take advantage of information and communication technologies, as tools for the development of knowledge, economy and political and ideological activity.

Intended to support the instrumentation of the comprehensive policy for the improvement of the computerization of society, legal regulations have been issued that order the process in search of raising technological sovereignty for the benefit of

society, to serve as a guide national entity and the population, in the development, exploitation and use of communications services.

It is also conceived in the Guidelines of the Economic and Social Policy of the Party and the Revolution for the period 2016-2021, which states in number 122 that in Cuba it is a need to advance in the computerization of the education system. Develop, in a rational way, the services in the use of the telematic network and educational technology, as well as the generation of digital and audiovisual content.

In this line, the Ministry of Education (MINED) has directed its work towards objective 3: "Strengthen institutional communication and the development of computerization in the Ministry of Education" (MINED, 2019b, p. 6).

The work objectives of the MINED were aimed at increasing the connection of the centers. At the moment they are directed towards the creation of the users of the new connected centers and the use they make of the network, as well as the presence of these institutions in the network, disseminating the achievements of education from their own protagonists through of websites. For this, the substantive process Computerization of the National Education System was drawn up with the measurement indicator 1.11.1 "Percentage of centers connected to the network that has an institutional website" (MINED, 2019b, p. 6).

An exploratory study was carried out in the period from 2016 to 2019, taking into account minutes of the Board of Directors of the Provincial Directorate of Education, reports of methodologists' visits and reports of the provincial Educational Technology Group, which showed the existence of inadequate institutional communication by not disclosing the services provided by educational centers on computer networks. There is evidence of a contradiction between what is guided by the MINED measurement indicator and the current state of visualization of the institutional websites of educational centers in the province of Pinar del Río.

This contradiction led to the objective of determining the theoretical references that support the visualization management of the institutional websites of the educational centers in Pinar del Río.

The orientation of the investigative process was carried out through the dialectical conception, which has the dialectical-materialist method as its methodological basis, for which a system of theoretical methods was used, based on the criteria of Rodríguez & Pérez (2017).

The historical-logical: it was used in the study of the stages through which the computerization process of the educational system of the province has passed, which allowed determining its trends and regularities.

The analytical-synthetic: it was applied to reach the specific and general knowledge about the computerization process of the educational system and allowed to analyze the documentation related to the research topic.

The inductive-deductive: it was used in the study of the theoretical referents to obtain generalizing conclusions.

The modeling: allowed to represent the fundamental characteristics and relationships in the definition of the visualization management of the websites of the educational centers.

The systemic-structural-functional: it was adopted to determine the components and their links, the structure and hierarchical and functional relationships.

Systematization: for the interpretation, enrichment, confrontation, modification and construction of theoretical-practical knowledge about the computerization process and, within it, the visualization of the websites of educational centers.

DEVELOPMENT

Due to the need to communicate the results, the term computerization has been approached by different authors. According to Minc & Nora (1980), it is a combination of telecommunications and automated data processing aimed at developing and solving society's problems.

According to IKEI (1984), it can be considered that a company is computerized if it uses computer services on its own, shared or third-party computer, for the execution of one or more functions.

Stusser & Rodríguez (2006) perceive it as a problem that is solved by creating computer networks and other Information and Communication Technologies (ICT) between entities and that requires multiple multidisciplinary scientific research projects, technological development and a lot of academic exchange.

It is the integration of multiple processes (Díaz *et al.*, 2015) that encompass the technological infrastructure, the development of computer applications, internal and external connectivity and the roles of human resources.

The aforementioned authors have not considered that computerization is put at the service of society; however, computerization is understood by Rodríguez (2018) as the process of orderly and massive use of ICTs to meet the information and knowledge needs of all people and spheres of society.

The Cuban state has projected itself in this regard through decree 370/2019 in its article 2:

The computerization of society is the process of orderly and massive application of Information and Communication Technologies in the management of information and knowledge, with the required security, to gradually meet the needs of all spheres of social life, in its effort by the State to achieve more and more effectiveness and efficiency in the processes, as well as greater generation of wealth and increase in the quality of life of citizens (State Council, 2019, p. 2).

It is identified in the above that, for the computerization process to occur, the use of computers and computer networks is required, which express the results of research projects, and the use of computer applications to meet the needs of citizens.

What was proposed by the Council of State in 2019 on computerization is assumed, since it puts at the center the use of technologies based on the services of society with due security, which allows efficiency and effectiveness in the processes of facing the citizen.

Within the spheres of society that have an impact on computerization processes, the educational system is not exempt. This is proposed as the official conglomerate of schools and the administrative body that transcends and organizes those (Zayas & Rodríguez, 2010). The set of schools, teachers, authorities and regulations, with a strong link to the state through an administrative apparatus.

Other authors (Pérez & Merino, 2016) see it as a teaching structure made up of a set of institutions and agencies that regulate, finance and provide services for the exercise of education, according to policies, relationships, structures and measures dictated by the state from a country.

It has also been considered as "… the organized set of educational services and actions carried out by the State through the Ministries of Education based on regulations. It includes the levels of education and other educational services" (Bermúdez, 2016, paragraph. 6).

In Cuba, the Ministry of Education has as its mission, "to direct, execute and control the application of the State and Government policy in educational activity" (MINED, 2019a, paragraph. 1).

Among its functions, it establishes, advises and controls the application of the legal and methodological provisions that govern the educational teaching process of the levels it directs. In addition, it systematically advises and guides the provincial directorates of education, to promote the proper development of their functions, actions that the latter carries out in turn with the municipal directorates and these with the schools that are the basis of the processes (MINED 2019a).

It is possible to identify that, among the main characteristics of educational systems, the hierarchical organization of organizations and schools stands out, which respond to state policies, aimed at developing educational activity.

The authors assume what is proposed by the MINED, since among its functions it establishes the application of the legal and methodological provisions that govern the educational teaching process, among which are human and material resources, as well as ICT media.

In Pinar del Río, the computerization of the educational system is governed by the Department of Educational Technology of the Provincial Directorate of Education, with a structure that methodologically directs the municipal directorates and these, in turn, all the educational centers of the province, because its objective has been proposed as the permanent preparation of teaching staff and in training regarding the use of ICT in education, through the use of computer and audiovisual resources, to support the educational teaching process, under the precepts of the strategy national computerization of Cuban society (MINED, 2017).

> The Directorate of Educational Technology, together with the provincial directorates of Education, are responsible for guaranteeing the implementation of a training system for students, teachers and workers in the sector linked to technologies, prior activation of services, using all means at your fingertips for the constant updating, evaluation and systematization of knowledge (MINED, 2018, p. 2).

The connectivity of the centers and associated services must be based on the Teaching-Learning Process, so students, teachers, managers and technicians involved in the process are included (MINED, 2018), so these actors have configured navigation and email services to be used both in their preparation and in classes, linking with the different subjects.

In this regard, Álvarez *et al.* (2018), saying that: "Education to take on the challenges imposed by society through the development process requires the management of ICTs, which offer more attractive platforms for those who are in the classroom. In Pinar del

Río, the Provincial Directorate implements strategies to generalize its use and to constitute a tool at the service of professional management" (p. 18).

The implication of ICT in the daily life of students and teachers has been happening without pause in recent years. Networks allow students and teachers to find new ways to acquire, apply and relate knowledge, actions that are somewhat stagnant due to the real possibilities of traditional teaching (Reyes & Martínez, 2019).

The Ministry of Education, in correspondence with the country's Informatization policy, has developed an ICT adoption plan, which allows drawing up projects aimed at automating educational management within the school and the development of digital content for common use in its telematic network ("Start of the school year in education (II part)", 2019).

Consequently, work is being done on the gradual connection of all the centers to the network. In this regard, Ortega (2019) has referred, stating that it is intended that each address and each connected school have its website, the presence of the school where the educational environment is seen and the dissemination of its work.

It stands out as a characteristic that the Provincial Directorate of Education is in charge of organizing, planning, executing and controlling the computerization process that must occur in the educational subsystems, for which the authors assume what Álvarez *et al.* when they address that the use of ICT in education is at the service of society through interactive platforms.

In order to use the computer resources that the Pinar del Río educational system possesses for the purposes that were determined, it is necessary to manage them. Casassus (2002) has understood management as the ability to generate an adequate relationship between the structure, strategy, systems, style, capabilities, people and the higher objectives of the organization. The ability to articulate the resources available to achieve what is desired.

According to Benavides (2011): "They are guides to guide action, forecasting, visualization and use of resources and efforts for the purposes to be achieved, the sequence of activities that must be carried out to achieve objectives and time" (p.13).

For Morales & Morales (2014) it is a particular process consisting of the activities of planning, organization, execution and control, carried out to determine and achieve the objectives indicated with the use of human resources and material resources.

Currently, the concept of management has become hegemonic and is associated with administrative or business conceptions (Manrique, 2016). This has resulted in the fact that in computerization processes the content of these conceptualizations is not sufficient to understand them, since it goes a little beyond this circle.

It has been handled by Ramírez & Ramírez (2016) as a human activity that is expressed in decision-making and in the management of resources through the processes of planning, organization, direction, coordination and control.

Raffino (2019) has raised management as the administration of resources within an institution to achieve the proposed objectives, considering it as a process with several stages: planning, organization, direction and control.

It is observed that management is characterized as a human activity, in which resources are managed following an order or logic, with the aim of achieving desired results.

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The criteria of Raffino and Morales & Morales are assumed, since they observe the structuring of management as a multi-stage process: planning, organization, execution and control, necessary to achieve the objectives through the use of human and material resources.

Among the resources to be managed as part of the aforementioned process of computerization of the Cuban educational system are the institutional websites.

According to Alonso (2008) it is an information and communication structure generated in the communication space, created by the application of ICT, carrying actions and content, offering services for users who visit it and who can satisfy their needs.

A website provides a relatively simple means of interaction for users seeking to offer or obtain goods, services, or information; constituting an infrastructure for social exchange, networks and diffusion processes (DiPerna, 2009).

A website presents the institution and transmits information about the entity, prioritizing and highlighting aspects that motivate its knowledge: its direction and trajectory, its history, its direction and management, among others (Tallarico, 2012).

According to Ortiz (2012), for organizations, the institutional website has become both a scenario for the dissemination of content and promotion of services, as well as a bridge of communication and interaction between companies and users.

The website is usually one of the most outstanding components of an institution: "Having a website is decisive for the visibility of the business and can be the difference between the success and failure of an institution" (Fernández, 2016, p. 1).

According to Hiard's criteria (2016), an institutional website is an extraordinary showcase in which the know-how, products and services of companies are exposed, a vector to convey notoriety and credibility.

They have specified Villarreal *et al.* (2017) that, especially in academic and scientific institutions, websites serve as windows of the institution from which linked intellectual production can be displayed.

Alonso (2017) points out that institutional web page are beginning to be the daily practice of various organizations; what breaks prejudices and forms a vanguard of the necessary communication opening an essential path. A practice that allows growth as a society.

Based on what was investigated by Sanabre *et al.* (2019) can be seen as a tool provided by ICT from network infrastructures to develop virtual presence of organizations or companies.

It can be highlighted that, among the main characteristics of institutional websites, it is found that they are accessible communication structures, generated by the use of ICT, for the transmission of information of the entities and currently it is one of the main tasks of the institutional communication process of the companies the existence of the same to communicate to the public the work of these.

The authors are of the criterion to assume what was expressed by Hiard and Sanabre *et al.,* since the credibility and notoriety of the institution is due to the exposure that it makes of its products and services and the interaction that it can achieve with users who visit this type of site, which in the educational system gives the possibility of communicating the results of the institutions.

It can then be said that, for there to be a presence of websites in educational

institutions to disseminate their work and for it to reach users, it is necessary to achieve their visualization.

Visualization is considered by Ware (2004) as an increasingly important part of cognitive systems because it provides the channel with the highest bandwidth from the computer to the human, being the interface between the two.

The authors are of the opinion that this is too simple an approach and only includes the extremes of the process.

Visualization, according to Torres (2009) is a "... task of the communicative process, by means of which abstract data and complex phenomena of reality are transformed into visible messages, and which leads to a process of discovering knowledge" (p.164).

Other authors have referred to it as "characteristic of visual representations, different depending on the support, that seek to fully represent reality; it is a widely used resource in institutions that use these representations to provide knowledge to heterogeneous citizens" (Valero *et al.* , 2014, p. 488).

In this regard, Pérez & Merino (2015) mention visualization as giving visible characteristics to what is not seen by converting abstract information into images, achieving a representation of reality.

It is evident that, for visualization to exist, the presence of data that can be translated into a visual representation, that transmits some knowledge, is necessary.

It is the criteria of the authors to assume what Pérez and Merino expressed about granting visible characteristics to the results of the management of educational institutions so that they are accessible to people.

CONCLUSIONS

It has been possible to determine the theoretical references of the management of the visualization of the institutional websites of educational centers, based on what was assumed by the referenced authors, allowing to define the "management of the visualization of the institutional websites" as the process of planning, organization, execution and control of the granting of visual characteristics to the data generated in educational institutions through websites, which allows the interaction of users with their services.

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Conflict of interests

The authors declare not to have any interest conflicts.

Authors contribution

The authors have participated in the writing, revision, updating of the bibliographic sources of the article.

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