

Computer security and virtual activities: The new times of communication

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Abstract: This work presents a bibliographic analysis of the aspects associated with computer security, from the social and academic point of view. The new times demand a more distant communication, lacking physical contact and with a wide incidence of use of computer media, which facilitate online interaction. However, it is important to highlight the criteria related to computer security, which will be the key necessary to maintain good communications that facilitate learning, human interaction, respect for people and the assessment of appropriate content. In this work, the activities most commonly used in current times where the health situation affects various aspects of daily life are taken into account. As main results, it is observed that computer security must meet certain minimum parameters to guarantee effective communication, and in addition to this, ethics and social values stand out.

Keywords: Computer security, effective communication, online interaction.

Seguridad informática y actividades virtuales: Los nuevos tiempos de la comunicación

Resumen: En este trabajo se presenta un análisis bibliográfico de los aspectos asociados a la seguridad informática, desde el punto de vista social y académico. Los nuevos tiempos exigen una comunicación más distante, carente de contacto físico y con una amplia incidencia de uso de medios informáticos, que facilitan la interacción online. Sin embargo resulta importante destacar los criterios relacionados a la seguridad informática, que serán la clave necesaria para mantener buenas comunicaciones que faciliten el aprendizaje, la interacción humana, el respeto por las personas y la valoración de contenido apropiado. En este trabajo se toman en cuenta las actividades más comúnmente utilizadas en los tiempos actuales donde la situación de salud afecta varios aspectos de la vida cotidiana. Como principales resultados se observan que la seguridad informática debe cumplir ciertos parámetros mínimos para garantizar la comunicación efectiva, y adicional a ello se destaca la ética y valores sociales.

Palabras Clave: Seguridad informática, comunicación efectiva, interacción online.



I. INTRODUCTION

The present-day turned out to be very unexpected, with global health situations that no one could have predicted, leading to new ways of living [1]. These new lifestyles have had to be learned unexpectedly, improvised, and on the fly. Such is the case of new ways of communicating, where the most effective and secure method has been online interaction, through digital platforms that allow us to exchange voice, audio, and video.

One of the main activities that were forced to migrate to an online environment was education and academic processes. This radical change in a process that already had its shortcomings, and its natural and internal difficulties. Thus, online education came to occupy the spaces of home and family, but it also brought a set of elements associated with virtual communication, which were not foreseen and have had to be addressed in an improvised manner. Such is the case of computer security, ethical processes of communication, and privacy of communications.

This paper will evaluate the aspects associated with computer security and its impact on new lifestyles. This will take into account the repercussions in education with virtual environments, focused on the quality of collaborative work [2], as a necessary tool for classroom work, assessing learning styles.

For this study, some scientific articles, academic and bibliographic material were evaluated to learn about the relevance of virtual communities and the new ways of communicating. We took into account those works that considered virtual environments as new life alternatives, highlighting the methodologies necessary for an efficient and effective process in the new societies.

The work is composed of four fundamental sections, which comprise this introduction that contextualizes the subject of study, followed by the development with the theoretical foundation, then the methodology with the processes carried out, and finally the results and conclusions.

II. DEVELOPMENT

Communication has always been a human need, indispensable for the interaction and formulation of ideas, laws, processes in societies [3]. The writing was born approximately 4,000 years before Christ, representing a way to communicate among humans, through symbols and graphics that represented characteristics of the environment. Later on, writing evolved from papyrus to paper telegrams [3]. All this meant a cultural, social, and technological advance for people.

A. The printing press and its impact on communication

In 1450 Gutenberg [3] devised a process of printed reproduction of information, thus creating the printing press. This type of development signified a new mode of communication in the society of the time. This gave way to the newspaper, and the way of transmitting a message, a piece of news, giving rise to a new form of communication, innovative and technological for that time. However, there were problems in assembling the documents, but it did not take long for linotype and monotype to appear, which optimized the production time of books and assembled material.

In this way, communication underwent an important advance and with it, the academic processes, the processes of scientific dissemination, and the transmission of knowledge was modified. This meant a change in daily life and in the ways of communicating.

Fig.1 shows the basic structure of the printing press, which meant a transforming technological development for the industrial era, and brought positive repercussions in the academy with the massive structuring of books and educational material.

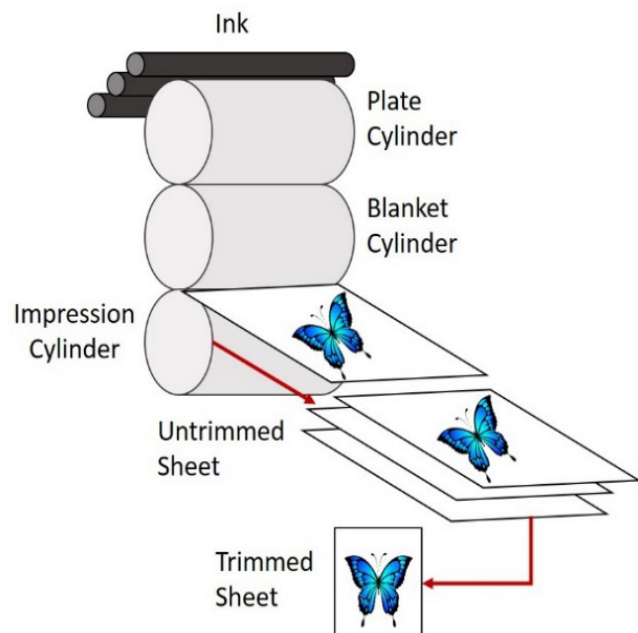


Fig. 1. Basic structure of a printing plant [3].

B. Radio and social communication

In the 20th century, scientists discovered that it was possible to transmit voice through a cable [4], giving rise to the radio. This invention ushered in a new technological and communicational era.

The radio began to be part of homes, institutions, and communication centers, it became an indispensable communication tool. And it changed the way of seeing the world by then. Radio is currently one of the ways to communicate for information purposes, for entertainment, as a mass medium of communication.

The first phases of distance education began with postcards, then followed by radio education in the USA [5] in 1922. This type of method had important results in education and allowed the beginning of an era of distance learning.

C. Television and its impact on communication

In 1884, a large-scale communicational phenomenon was born, televisión [6] represented an important development for society since it was not only possible to have audio but also moving images. Hence, a broader communication process began, but with less interaction than radio, which allowed a more direct exchange with people.

The media then moved into another phase of evolution, but social exchanges continued around television, programs, soap operas, information.

D. The communications challenge: The Internet

In 1985 the first open Internet network was created [5] and it was then that an important leap was made in the way of communicating. The use of electronic mail was born and with it, direct, fast, and effective communication over long distances. It was no longer essential to move from one place to another to transmit an immediate message. The E-mail also brought with it the possibility of attaching attachments, such as letters and documents, easily and immediately.

In 1996, the first fully online university was founded [5], but the laws of communication and high-performance computing had already been established in 1991. In this way, online teaching was born, creating youtube edu in 2009 and later creating the MOOC era.

The internet has been one of the most innovative inventions for human communications, not only has it had an impact on the way messages are transmitted, but it has also had an important impact on educational processes, teaching methodologies, and ways of learning.

E. Some scientific analysis

Sánchez [7] states that information security is a challenge, a consequence of the proliferation of new technologies. Virtual environments consist of a portable file, which, unlike physical space, does not take up much space and has no representative infrastructure, so the risk of being completely stolen is higher than that which could exist for physical space.

In this way, virtual machines are susceptible to computer attacks, so the virtual machine administrator must take precautions and be alert to possible system failures.

The storage of information on the network is a risk for the data, hence the need to create information and data protection. For this purpose, mechanisms are created to isolate each machine from the others and to maintain the reliability of the information and material stored.

But when talking about security, not only the stored data are taken into account, it is also important to highlight that the new forms of virtual communication have new tools for capturing voice, image, and video. This implies other aspects to evaluate when talking about security.

Technological tools appear as an option for education [8], not only to make it accessible in many directions and remotely, but also to replace face-to-face activities, which for pandemic reasons have had to be suspended.

In addition to having to learn in an improvised way, virtual education activities have had to comply with programs designed for face-to-face environments. This old-fashioned way of teaching with a modern method has caused a major change in education and has had a drastic impact on learning (Fig. 2). For example, there is still no law that guarantees the security of the information handled in virtual spaces, such as the case of images of minors who are forced to watch classes with the camera on, exposing their faces. It is also possible to highlight the exposure of teachers in virtual spaces.

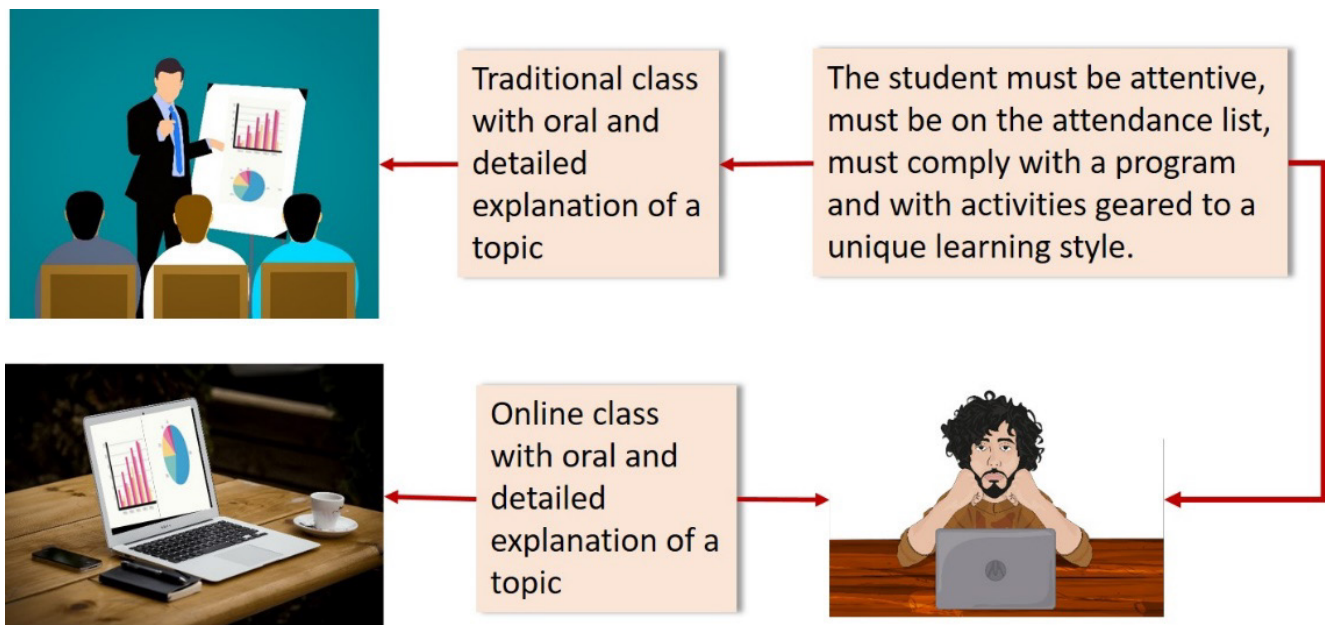


Fig. 2. Online education as an ancient teaching with a modern method.

In this way, online education becomes a problem for the academic community, because it maintains old processes in modern methods, affecting communication in the teaching process.

Online education could be a tool for the development of more open professionals, with greater capacity for abstraction, greater skills for teamwork, greater skills for self-learning and greater mastery of the individual learning style, however, maintaining face-to-face methods in an online education may mean the delay and deterioration of the professional of the future.

The role of information security will be not only in the preservation and care of information, but also in the ways to maintain the integrity of the people involved, of what is said and done in virtual spaces.

Authors specialized in computer security [9] affirm that the use of Linux in the design of cryptographic and computer security platforms can be a viable and reliable alternative. This type of tool offers the possibilities of extension and fast configurations in computational environments.

Salinas [10] states that virtual environments have become a socio-cultural characteristic and that the school represents the appropriate space for the digital literacy necessary for the management of computer tools of the new generations. Generating virtual teaching spaces is optimal to disseminate the teaching of digital tools, and also allows to address three basic elements that are the knowledge and technical use of computers, the acquisition of cognitive skills for the use of multimedia resources, and finally allows the development of critical skills

for the valuation of computer tools.

Currently, a virtual learning environment includes some basic elements such as:

- Classroom material is permanently available.
- It allows multidirectional communication among those involved.
- Shared work environment
- Collaborative activities.
- Need for active participation.

There are a small number of virtual learning spaces, which are e-learning platforms, blogs and web pages, wikis, and social networks [10], which can be distinguished from each other by the technological dimensions and the possibilities of interaction between participants.

Some authors [11] have exposed the most relevant aspects of security for educational platforms, as is the case of moodle. The security aspects are then raised in four important aspects:

Server security

The platform is not linked to the server, it is independent of it. But it is of great importance to have an appropriate antivirus, control over updates, management, and control over the use of the open internet, use of passwords, separation of the moodle data folder, prevention of remote access, appropriate configuration to prevent the intervention of other unauthorized IP addresses [11].

Authentication protection

An efficient way to ensure the user authentication process is through manual account creation so that the administrator can give access to the accounts and avoid possible unauthorized access. However, this type of process may not be efficient in the case of massive accounts, for which mail authentication is more convenient, provided that there is an appropriate configuration.

Access security

The use of passwords has been a common activity in recent years, however, the platform administrator must request certain criteria to ensure a reliable password. There are no standardized parameters for password requirements, however, some criteria can improve the quality of the password, such as the use of alphanumeric, upper and lower case, a minimum length of 8 digits, and some special characters.

Another important aspect of security is that passwords should be easy for the user to remember so that they do not have to reset them frequently.

The creation of secure roles

The moodle platform comes with seven secure roles configured; administrator, course creator, teacher, non-editing teacher, student, guest, authenticated user. Each of which has specific permissions well defined. If this role assignment is not done properly, there is a risk of internal attacks.

III. METHODOLOGY

For this paper, we analyzed academic works related to new forms of communication and the importance of computer security. The new communication trends are a trigger for the generation of laws and statutes to ensure data protection, but also to ensure the shared information such as image, sound, video of people interacting in communication.

We analyzed the securities referred to the communication platforms, but also the securities referred to the people or users, to the preservation of images, photos, voices, videos of those involved in the communication process.

Figure 1 describes the phases carried out for the bibliographic review of this work. At first, a delimitation of the information was carried out, to then evaluate the search strategies and define the criteria for exclusion and inclusion of works. In this case, an exclusion criterion was considered to be those aspects that were not focused on communication and that did not have a technological approach; therefore, the inclusion criteria were based on works associated with informatics, security, and new communication trends. The selection and processing of data were based on the argumentation of all the informatics and scientific elements that make current communications possible and that are transformative in virtual social environments.

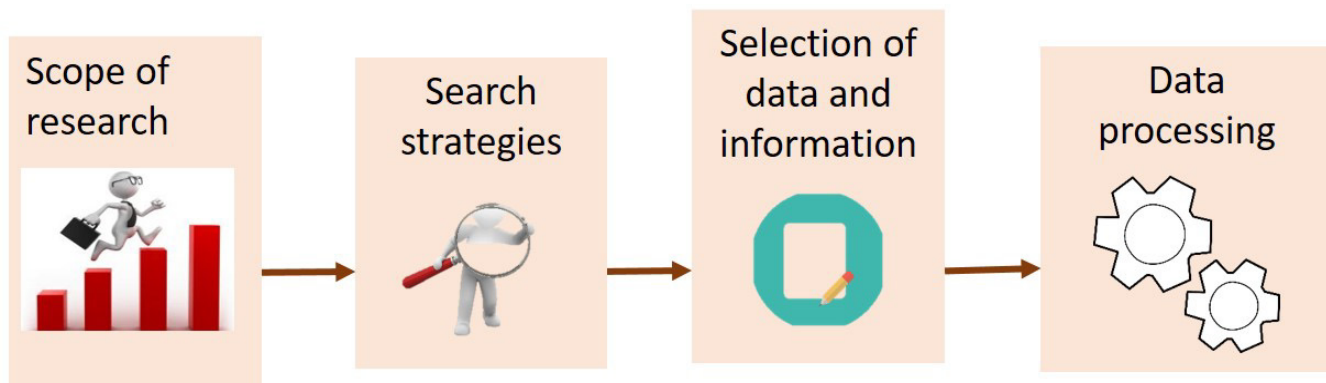


Fig.3. Phases of the bibliographic review

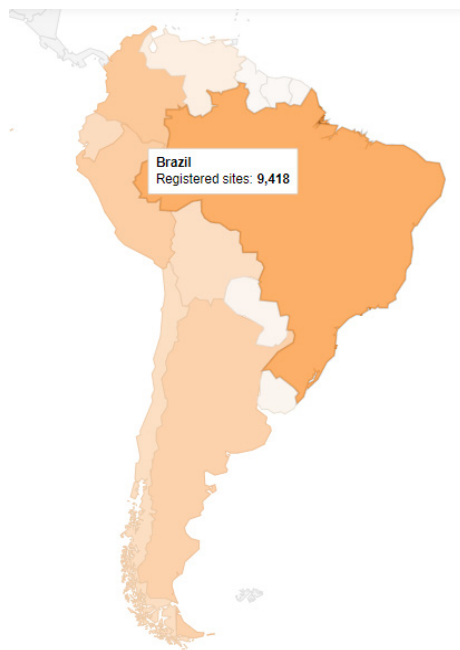
IV. RESULTS

After reviewing the academic and scientific material, it was possible to find the following results:

1. A significant number of professionals have opted for online studies, as they are convenient for self-management of time and self-learning. In the USA, 83% of people opted for online courses in 2020. But what is even more interesting is that 68% of online courses are taken by people over the age

of 40 [12].

2. The use of educational platforms such as moodle has grown significantly in the last year; at least 246 countries use this tool for access to online education. In South America (Fig.4) the platform has a very high impact, and allows effective interaction between students and teachers [13].



Brazil has the highest number of moodle platforms installed, with a total of 9418 sites, while Ecuador has 3566 registered sites. However, considering a population of 211 million inhabitants in Brazil and 17.37 million in Ecuador, the use of moodle is higher in Ecuador than in Brazil [13].

3. The key factors that stand out in online communication are associated with customer service, with security being a relevant aspect for users. The preservation of data and the guarantee of information security are necessarily important elements for all online activities. However, in a survey conducted, it was observed that 66% of users give more weight to the content of academic information than to other aesthetic aspects of the website [12].

4. Today's communications require clear regulations regarding computer security, but there are still no well-defined parameters for controlling security on computer sites. Personal information is still vulnerable, and therefore the use of photos, cameras, and personal data are susceptible to theft and manipulation. In Ecuador, there is no data protection law, much less a law of sanctions for the misuse of information. Therefore, the use of platforms and digital media continues to be a risk for users, especially in the education sector where students and teachers share virtual spaces permanently.

5. In the United States, only 33% of students stated that they were not satisfied with online education [12]. In the past, face-to-face education required students to travel long distances, which often had implicit implications, such as renting apartments and rooms to stay during the academic period, as well as living in other

cities or areas closer to the center of study.

6. Effective learning recognizes the virtuality of spaces that allow students to interact from the comfort of their homes, without wasting time and money in traffic, rentals, and resources of the presentality, such as the use of appropriate clothing, backpacks, and other materials of the academy.

V. CONCLUSIONS

Once the documentary review on computer security has been carried out, it is possible to draw the following conclusions:

1. Computer security comprises technical aspects and personal aspects, which include the installation of antivirus, the proper use of passwords but also the way people communicate, taking into account the protection of sensitive information such as photos and personal data.

2. The new ways of communicating, through online platforms, create virtual communities, which open space to a new way of exchanging information, making it more sensitive to theft and manipulation. It is, therefore, necessary to review the environments of meetings and virtual activities that are carried out, to ensure the proper use of shared information.

3. Being responsible for the use of information in classrooms and virtual spaces should be an added value of current teaching, which promotes respect for photos and videos shared for teaching, and that they are not used for mockery, offenses, and other inappropriate uses.

4. The use of computer tools has not only become the common way to interact but will probably be the best way to interact in the coming years, in a way that ensures health conditions and also allows people to self-manage their time to carry out multiple activities simultaneously.

5. Reservations in the use of confidential and personal information must be made rigorously and carefully because even if there were strict laws for the conservation and good use of personal material, it will always be difficult to control the bad actions of unscrupulous people who improperly take data for improper treatment of them.

6. The correct use of words and conversations in virtual environments can ensure greater peace of mind in the processing of information, since once a recording of a class, conversation, or social activity has been made in online spaces, it is not possible to correct it and the record or evidence of what has been said remains, causing a possible misuse of the resource. This was not

possible in personal environments, however, in the new virtual spaces, it is a common practice with which great caution should be taken.

7. The installation of security mechanisms can ensure appropriate but not absolute data preservation, which can contribute to a better way of transmitting information with minimal risk.

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