



Technological Strategies For Teachers Through The Use Of Collaborative Tools.

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ABSTRACT

This document addresses various aspects in relation to the use of collaborative tools for teachers and their integration with information technologies (IT). Collaborative tools represent a disruptive process for the teacher, affecting all scenarios of the teaching-learning process, starting from the transformation of pedagogical resources and evaluation instruments, to rethinking the configuration of curricula to integrate the competencies and skills demanded by IT in the current training process. This article aims to analyze some aspects, causes and factors when integrating collaborative tools in the field of teaching. A qualitative methodological instrument was developed, applied to two profiles and levels of teaching with a population of 175 professionals. The results reveal that teachers are unaware of various aspects, tools, use and environment of the new technological platforms, which, depending on their gender, age and level, are involved in the strategic exchange of the new technological challenge.

Keywords: Digital environment, Technological ecosystems, Digital divide, ICT, Education

1. Introduction

During the expansion of the digital era, the use of information technologies (IT) is present in every activity of our society. The mere use of collaborative tools in teaching is an advance in the interaction of these tools in the educational field. Technology is advancing rapidly, transforming the traditional methods of teaching and participation of teaching applied to various contexts and for specific purposes in accordance with the systematic changes required by the new educational models, the digital need driven by the demanding needs of the knowledge society through the use of technology which, have transcended in an important way, offering education, teaching and the teaching process in general, various benefits for development and growth, pedagogical today. (Cabero-Almenara, J. & Palacios-Rodríguez, A, 2020)

For Romero (2020), the paradigm shifts in the current educational process represent a challenge, their impact is focused on the use of information technologies in teaching, which represents a process of adaptation that allows the best collaborative tools to be leveraged to achieve the individual and collective benefits of teaching. The wide field of opportunities offered by information technologies in the educational field are of incalculable dimensions, making them one of the central axes in the training of the student and the engine of change for the teacher, the latter, obliged to have a more relevant participation through the use of various collaborative tools for the development of their activities in the educational context. . (Salinas & de Benito, 2020)

Technological diversity and the creation of new highly systematized environments in which we find ourselves, promote changes in the educational sector, their use through collaborative tools that are transformative agents for the simplification of communication, organization and control in the work in the classrooms between students and teachers. Under this vision, Mosquera, (2022), states that technification allows users to establish a different information exchange scheme with the use of collaborative tools, and through them, rethink the integration of projects regardless of the distance, as well as the dynamic formation of content for students through videoconferences and other types of educational digital resources found on the Internet. .(Pinto Santos, Cortés Peña, & Alfaro Camargo, 2017)(Cabero-Almenara, J. & Palacios-Rodríguez, A, 2020)

2. Documentary review

2.1. Collaborative tools and digital skills.

With the arrival of Web 4.0, various terms that operate in our society and that are also included in the field of education were conceptualized. The resources established from this technological generation are encompassed in the action of people connecting to people, which allows a scheme of collaboration and sharing through the participation of the main actors in the exercise of teaching, transforming the methods and forms of the dissemination of knowledge to digital, virtual environments, using tools and schemes of collaboration existing on the web and in other types of environments of this digital era. . According to León et al, (2023), the collaborative tools approach can be described as: (Sosa-Bone, 2024) *The computer service created to establish a new scheme of group work, as well as its communication, since they allow simultaneous interaction in the same task in real time, without having a physical displacement of the collaborators.*

According to Prats et al, (2021), for the educational field, collaborative tools have been used to improve interaction between students and teachers, encourage teamwork, facilitate feedback, and promote student participation in the learning process. Some of these tools include online learning platforms, blogs, wikis, discussion forums, and educational social networks. The use of collaborative tools in education has demonstrated several benefits, which seek to promote the development of social skills, such as collaboration, effective communication, and group problem solving. From this vision they also foster critical thinking and creativity by allowing students to work together in the generation of ideas and solutions through the various digital instruments, providing a near-native means of collaboration for these generations in training and an almost unexplored environment for teachers.(Reis, Pessoa, & Gallego-Arrufat, 2019) (Mosquera, 2022)(Vilches Vilela & Reche Urbano, 2019)

Digital competence is described as the ability to use digital technology effectively, in various contexts and in the field of teaching must be secure, as well as it must include skills with the use of the internet, the management of applications, the mastery of software tools, platforms and the understanding of online security concepts to safeguard personal data and the correct orientation to avoid computer attacks. . According to Agustín et al, (2022), developing this competence not only includes acquiring technical skills, but also the ability to adapt quickly to the changes and tools of the new technological scenarios that exist in the digital society and from this approach critically evaluate the use and exploitation of the potential for problem solving and process improvement.(Sánchez-Cruzado, Santiago Campión R, & Sánchez-Compañía, 2021)

In addition, collaborative tools in education have been especially relevant during the COVID-19 crisis, as they have allowed schools to continue with classes remotely, . In various interpretations of collaborative tools, Duque et al, (2022), describe them as the means that has facilitated communication between students and teachers, access to online educational resources, and the realization of collaborative activities at a distance.(Betancurt & Cadena, 2022)

2.2. Context of the use of university collaborative tools.

The use of technological resources, as well as collaborative tools, are fundamental factors for the field of knowledge transfer in the university environment, this from the objective of developing in a comprehensive and professional way the digital skills that teachers must assume, which requires a full adaptation to the technological demands of the society of the XXI century. . This transformation responds not only to fashionable factors, but also to the growing and accelerated need to link new learning environments, which are currently more dynamic, interactive and flexible, where the role of information technologies contributes not only to facilitate teaching, but also to promote integral collaboration. dynamic and assertive of the students, encouraging them to develop critical thinking. (Arguedas, 2021)

According to Soto et al, (2016), in the teacher-tool linkage, new routes and strategies are established where the student is integrated into a highly participatory training cycle, through this cycle of interaction, various technological scenarios are proposed, where dynamic group environments prepared for collective participation are combined. it contributes to the training of students in the use and manipulation of tools, providing them with practical and digital skills, fundamental actions for the exchange of ideas, as well as the resolution of simulated problems jointly, preparing students for recent digital ecosystems, through the comprehensive approach to the modern scenarios of their profession, Zuña et al, (2020).

The transformation of the traditional teacher to a learning experience facilitator environment, which is currently integrated through the use of various communication, virtualization, simulation, digitization and collaboration tools such as: *Google Workspace, Microsoft Teams, Trello*, as well as course management tools such as: *Moodle and Edmodo*, among others. It becomes a disruptive and transformative impact for traditional university education, from the approach and demands of the knowledge society in which we currently interact, which promotes a transcendental participation for teacher training, which is reoriented to potentiate the practical skills of students, through information technologies. Avitia et al, (2018). From this participation, the need to transform and include new aspects to the cycle of action of teaching, where the trainer must acquire within his professional activities the mastery of digital skills, assuming a technological identity, allowing these references to be integrated now into one more element of his university teaching methodology, in this new digital era, (Arguedas, 2021). These technical aspects are integrated and used in the teaching

process at the higher level, which allows the technological adhesion of collaborative tools to the strategic teaching process.

2.3. Context of the use of collaborative tools at the upper secondary level.

Talking about intermediate transformation and specifically in reference to upper secondary education, various factors can be identified where collaborative tools and digital skills are visible. Several of these factors are linked to the academic binomial teacher – business linkage, which contributes to the vision of integrating technology for the training of students. Technical preparation, as well as the acquisition of soft and hard skills at the upper secondary level, are fundamental for the academic improvement of students, in this context, through the use of collaborative tools and digital competencies, the teaching-learning process is provided with an operational and technical diversity that drives teachers to respond to the demands posed by the needs of the economic and social sector. Its digital training offers students a preparation for a specific, digital and technical work environment, distributing traditional academic actions to increasingly digitized environments.

The use of some collaborative tools in the academic community of the upper secondary level can be identified as Google Classroom, Microsoft Teams, Schoology and Zoom, these are focused on the communication environment, as well as real-time collaboration tools such as the use of Google Drive, Microsoft 365, Padlet and jamboard among others, allowing teachers and students to create virtual workspaces, where the academic community seeks to have a highly digital participation to strengthen teamwork and from this disruptive process share ideas in real time, these demands to act are linked to the generational characteristics of the sector. Without a doubt, these platforms offer the flexibility to integrate multimedia resources, discussion forums and interactive activities, facilitating autonomous learning and the development of critical skills that are in high demand and used in today's knowledge society and in Education 4.0.

From this approach, for teachers, these collaborative tools are associated with the use of new emerging technologies, such as: artificial intelligence, Big Data, IoT, video games and virtual/augmented reality, as well as the sum of the various learning platforms that, through their use, are formulated projects based on experience, which contribute considerably to the integration of a dynamic environment within the classrooms. In addition, it also promotes a more dynamic, highly digital, inclusive and accessible learning environment. By associating the development of digital competencies with this new learning structure, the teacher of the upper secondary level reorients the digital dynamism that students bring, to a training process with ethical and responsible characteristics, where the opportunities and benefits that technology includes are included in their academic training, for the globalized competitiveness of our times.

These competencies allow teachers to apply pedagogical strategies that integrate the use of information technologies (IT) effectively, promoting digital literacy for actors who are still part of the statistics of the digital divide, such as certain young people who lack technological resources. By using these digital competencies, teachers replace various manual and traditional methods by applying assessment instruments for student performance in a more objective way, helping to obtain timely feedback and adapt traditional thematic content to interactive scenarios according to the individual needs of students and learning progress. In this context, the use of digital tools becomes a key skill for teachers and students at the high school level, who not only impart academic knowledge, but also prepare students to face the challenges of a digital society.

3. Methodology

The present research is based on a non-experimental descriptive approach, allowing an interpretation of the study variables without altering their context. From this approach, the proposed methodological design allows the analysis of the aspects, causes and factors of the use of collaborative tools in the implementation of technological strategies by teachers at the upper secondary and higher levels, in an educational sector of the municipality of the Center of the State of Tabasco. The specific objectives are aimed at identifying the aspects, causes and factors that influence the use of collaborative tools and digital skills, as well as the relationship that exists with sociodemographic elements and their perceived effect of these strategies on the teaching-learning process.

The scope of this research is based on the application of a digital survey through an online platform, using Google form, for a group of 175 teachers from various disciplines at the high school and high school levels, who responded to the instrument designed for this purpose. Data collection was carried out in the period from October 1, 2023 to February 28, 2024, using various social communication channels, which allow representative participation to be linked to the research process. The interpretation of the collected data was done using the Power BI version 2.112 tool, which allowed clear visualizations of the information to be obtained. In the present study, two independent variables are identified that allowed establishing a clear line for the interpretation of the elements necessary to achieve the objectives of the research. The first independent variable focuses on the challenges perceived by teachers when using collaborative tools, covering the following aspects: a).- Difficulties in the integration of collaborative tools in their pedagogical activities, b).-Insecurities related to data protection, uncertainty in the use of online services, c).-Perception of the effectiveness of collaborative tools to improve interaction with students, d).- Previous experiences in the use of tools such as Google Workspace, Microsoft Teams and Zoom, as well as, e).-Technological barriers related to infrastructure or insufficient training. In relation to the second independent variable, the elements that contribute to the

adoption and effective use of technological strategies are addressed, described in three sections: 1) The perception of institutional support in the use of digital strategies and collaborative tools, 2. Comprehensive participation in institutional training and workshops that provide training elements to the use of educational technology, and 3) The degree of confidence in the use of collaborative tools to promote student learning. In addition, 3 sociodemographic variables were analyzed that allowed establishing an interpretation of the impact of the use of collaborative tools and technological strategies of the academic levels, which are concentrated in: Gender (Male and Female), Age (25-34, 35-44, 45-54 and 55+) and Academic Degree (Bachelor's, Master's and Doctorate).

4. Results.

Based on the methodological model, the data obtained in the instrument were analyzed and interpreted, which show relevant findings of the teachers and their perception with the use of collaborative tools and digital strategy, according to the academic level of teaching. For the upper secondary level, 23% of the teachers establish that some of the aspects in the use of collaborative tools and strategies are perceived as an encouraging scenario to motivate the student in their training, exploiting generational skills and strengthening the technological link with the academic environment from a very interactive line of training. This allows strengthening the social and labor participation of students through the existing digital scenarios, 33% of the teachers determine that the aspects of use of these two transformative axes represent academic chaos, the approach responds to the need to know how to interact between the accelerated dynamics of students and their great attachment to the use and management of existing technological tools, The second axis is linked to the professional challenges for several teachers, in the lack of experience, use and mastery of information technologies and the English language, which represents a professional challenge in their understanding, and 44% of the teachers describe the aspects of integration as sterile, futuristic, derived from the lack of coupling with reality between the training fields of the students and their economic needs. to the manifestation of feelings of displacement caused by information technologies, this is reflected in the rejection of the use and implementation of technologies and the lack of realities of the types of facilities and equipment existing in educational establishments, as well as the obsolescence of academic syllabus, which lack a pertinent and objective update in accordance with the reality of the students.

Teachers at the upper secondary level with age characteristics between 25 and 34 years old maintain an interaction with students in a dynamic way, using diverse digital universes, tools, educational software, forming through it new teaching routes, capturing the interest of students, who demand a digital interaction with a greater impact within the teaching-learning process because they are digital natives. In the group of teachers with an age range of 35 to 44 and 45 to 54 years, they establish an interaction with students in a hybrid way, forging with it, various teaching routes with traditional characteristics, including technologies only for very specific aspects, where digital resources, multimedia and formal communication channels, They are determined by the teacher and must comply with various control characteristics, which involve a discrete, structured and monotonous participation in the use of collaborative tools, as well as a very simple intervention in the integration of digital strategies, which are based on training competencies, which seek to guarantee compliance with the academic structure. The group of 55+ teachers also participates in technological synergy, but from a very conservative approach, rigidly limiting the use of technology only to the essential elements in the interaction and that these are dictated by the institution that endorses the teaching-learning process, but it also promotes a high indicator of dissatisfaction with the use of technology in various points of teaching. transforming the tool into an inoperative scenario to carry out their training activity.

For higher level teachers, 35% establish that the causes of use of collaborative tools and digital strategies are transcendental for the training of students, educational and interconnected globalization is one of the causes of digital integration, directly affecting the training of students, who are driven by the digital presence immersed in a highly interconnected society. This technological approach at the higher level is observed from the simplification of the means of communication (directional, bidirectional and multidirectional), the expansion of opportunities for the development of online teamwork, the use of debate instruments, as well as virtual ecosystems for collaborative participation between students, teachers, regardless of their location, are some of the causes for the use of technologies in the university environment. 29% of university professors describe that the causes of the use of collaborative tools are linked to a fashionable scheme, which is disordered, transforming the student and the teacher into a distraction, thus motivating the student and teachers to acquire actions of disinterest, plagiarism and ethical ruptures in the management of information. As there are no adequate limits for the use of the tools, software or digital environment of the moment, many of these practices fall into abuse without providing greater training elements to students, as well as to their field of professional training; From the teachers' point of view, the need to exclude them is considered, as they are not regulated from the training field. For 36% of university teachers, they perceive that the use of collaborative tools and digital strategies is not used or included in academic activities due to the lack of adequate training, since many of the teachers do not receive adequate and specific training, which allows them to integrate the new collaborative tools and digital strategies into their didactic planning. Another aspect identified are the factors of insecurity in the use of tools, producing a phenomenon of disinterest and blocking the adhesion of innovative activities in teaching. Resistance to change is undoubtedly the predominant cause and effect, which is directly

established in the generational characteristics of teachers, work conformism, traditionalism, low professional identity and work demotivation are another cause of the lack of use of collaborative tools and digital strategies in the university environment.

From the analysis of teachers according to their age range for higher education, 17% between 25 and 34 years of age integrate the use of collaborative tools and digital strategies more dynamically in their academic activities, being predominant for those teachers with a bachelor's degree and of the female gender. 42% of teachers with an age range between 35 – 44, determine that the use of tools and strategies are a priority for the development of their academic plan, integrating various collaborative tools for the comprehensive training of university students, for some teachers in this classification with a Master's and Doctorate level of training, They state that one of the limitations of technological use is due to the lack of mastery of the English language, as well as socio-emotional factors on the part of university students such as: Professional demotivation, anxiety, stress and other detected causes, which are part of a certain list of factors of technological apathy on the part of students at the higher level. For 26% of university teachers between 44 and 54 years old, they establish that the integration of digital tools and strategies in their academic activities is very specific, according to the training field of the respective didactic and pedagogical plans. This group establishes that, from their perception, the excessive use of these resources translates into an academic and training disadvantage for the student, in the same way they state that not all university training environments should involve technologies as a training strategy, which promotes an erroneous practice today. Similarly, for this group of teachers, both genders agree on the importance of regulating and using technology as a strategic support for teaching, as well as establishing a clear integration of these resources in the university environment. Finally, 15% of teachers, aged 55+, establish that it is very complicated to adopt a single technological tool, the accelerated technological changes today are a clear reflection of this, therefore, it is necessary to maintain an iterative technological balance by generations, which allows training with greater clarity in knowledge than in the use of tools, which is constantly transformed within this digital expansion in which the education of the twenty-first century is immersed.

5. Conclusions

There are several reasons to implement the use of collaborative ☐ase☐ and digital strategies at the two training levels, reducing the digital divide is essential to establish these two resources within these training fields, but in the same way, factors and causes must be addressed in the field of teachers, constant training, Motivation for their ☐ase☐ión, technical equality, are just some of the factors to be addressed to increase the use of digital ☐ase☐ and strategies in the academic training universe. ☐ase☐i integration of digital strategies within the classroom, the needs of connectivity, equipment and software licensing for use within educational institutions must be addressed. The strengthening of digital culture is a priority, adherence to this evolution allows generating a renewal in the field of action of teaching, traditionalism is a phenomenon that is visible from the perception of disinterest, technological ignorance and lack of digital motivation. The strategic ☐ase☐ión of collaborative ☐ase☐ is intermittent, but feasible and real, at both levels of training various examples of their use are shown, therefore, providing a monitoring and technological support plan is and ☐ase☐ be the generational challenge that we have to ☐ase☐ after the lived experience of a pandemic.

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