EDUCATIONAL STRATEGIES BASED ON THE ANDRAGOGICAL APPROACH ASSOCIATED WITH DIGITAL TOOLS TO IMPROVE UNIVERSITY TEACHING

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Abstract

University education faces great challenges as a result of technological advances and the resistance of teachers to get directly involved with tools in favor of education, in this sense, this research had the general objective of determining the main andragogic strategies associated with digital tools used by teachers (FECYT-UTN) for the improvement of university teaching. The approach that directed the work was quantitative, with a descriptive level of depth, applying inductive-deductive methodology for the statements and conclusions; Likewise, a survey-type data collection instrument was applied, with closed questions and a Likert scaling, validated through the expert validation technique under the criteria of clarity, coherence and relevance by specialists in the area of education. applied to 137 teachers and 35 students, the data obtained was presented through frequency distribution tables, where the data was analyzed using descriptive statistics. It was possible to conclude that andragogic strategies that involve the use of digital tools can increase motivation and improve students' attitudes towards learning, by facilitating collaboration and teamwork, developing creativity and critical thinking, and adapting to different learning styles, being the tools most used

by teachers the Canva application that generates presentations and the Quizlet that facilitates the evaluations at the end of each class.

Keywords: Strategies-andragogy.

Introduction

Andragogy is an important science of education that allows the development of strategies in favor of the teaching of adults, through it the adult can be considered as a subject capable of questioning what he learns and the way in which he is acquiring his teaching. In this sense, "Andragogy revolutionizes traditional education for a more advanced and constructivist, from the application of avant-garde methods within the development of pedagogy, in order to bring knowledge in an affordable way to adults". It is very important within the adult teaching process, to be able to achieve more personalized levels of communication, thus being able to apply methods, strategies and procedures aimed at the elderly, to generate a change in educational practice compared to the cognitive, rote models that can be seen in universities throughout the region (Tobón, 2013, cited by (Mora, 2022)de Conde, 2023).

In different scenarios of higher education worldwide where many teachers due to their extensive experience and mastery of the chairs are not making use of current tools, strategies and methods that improve their professional performance, "This requires teachers to adopt a teaching style that can be more beneficial to students if needed. In such a way that effective tactics are executed for the learning and correct progress of andragogical strategies (Cuenca, 2023). Although we live in a technified society influenced by scientific and communicational advances, it is undeniable that universities exist very traditional teaching structures, characterized by the passivity of the student, who must conform to what the teacher directs, creating an academic conformism.

To break the schemes of monotony in higher education, it is required the incorporation of andragogic strategies that allow the active incorporation of the subject who learns, through the systematic use of actions that raise motivation and interest in learning, where he can make appropriate use of technology and its virtual tools applicable to the educational field, Many of the adults who study in the universities of the world are under family pressures, challenging social contexts, hostile work environments, which make them lose the motivation to learn, so andragogy favors in motivation "which is related to several factors related to cognitive, emotional and psychological aspects". It is evident that factors such as school absenteeism in adults, dropout, are associated with the rigid teaching practices of university teaching professionals. The distance between teachers and students does not allow us to focus attention on the subject who learns; Universities concentrate the academic process between the teacher and the content, where there are only quantitative interests and the humanized idea of teaching is lost.(Émond, 2022) (Polanca, 2005)

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On the other hand, in Ecuador it can be seen how most university teachers maintain a vertical teaching style and many of them far from the technological benefits, with little approach to students, giving continuity to classes of rote characteristics with behaviorist tendency, where the teacher is the absolute owner of the truth. Ecuadorian university classrooms have not managed to break with the traditional patterns of behavior that have been transmitted from generation to generation, preventing the use of good practices that favor the teaching-learning process. Profound changes must be made in the nation's university system to generate significant changes in the teaching style of teachers, create a change that allows the appropriate use of andragogical tools associated with technologies within the classroom and favor adult learning in vocational training.(Pulloquinga, 2022)

Universities in Ecuador require a sustained paradigmatic change in the andragogic bases that allow to see the human being as an integral being, loaded with work and family responsibilities that is also carrying out actions for their academic training, in this sense, "the andragogic principles of participation and horizontality, and the postulates of a different educational management, which will imply approaching organizations from a more creative, more human perspective to their students".(Toba, 2009)

At the University of the Technical University of the North, in the FECYT Faculty of Information Sciences and Audiovisual Media, it was possible to evidence the scarce use of andragogic strategies associated with technological tools by teachers, who create classes of little motivation and that maintain a verticality of distance between teachers and students of different careers, focusing its main action on the memorization of contents, away from the practical implications of many of the careers, and technological advances and their tools applicable to higher education, creating an environment of non-compliance by students with assigned activities and loss of motivation for their careers. Given this context described, the research question arises: What are the main andragogical strategies associated with the digital tools used by teachers (FECYT-UTN) for the improvement of university education?

1. Theoretical Framework and State of the Art

The theoretical framework is based on the explanatory elements of the concept of educational strategy, andragogical approach and digital tools associated with adult education.

1.1 Educational strategy.
1.1.1 Definition

"Educational strategies such as all those aids proposed by the teacher that are provided to the student to facilitate a deeper processing of information; that is, procedures or resources used by the teacher to promote meaningful learning." The main objective of educational strategies is to be an efficient resource in the transmission of knowledge for people who learn. On the other hand, these types of strategies "are procedures (sets of operations or skills), which a teacher uses in a conscious, controlled and intentional way as flexible instruments to teach

meaningfully and solve problems; likewise, they affirm that in each classroom where the learning process takes place" (Díaz, 2007, cited by (Vargas, 2020)Vargas, 2020).

1.1.2 Main strategies applied at the University

The application of educational strategies at the level of higher education is very important, because it favors the cognitive processes related to learning, likewise, emotional aspects are generated that favor teaching in adults (Schunk, 2012, cited by, Cástulo, 2017). Considering that student performance can vary depending on motivational and affective factors, these are promoted through strategies; The most significant ones are as follows:

Table 1. Learning strategies

Learning strategies	Main features
Organizational strategies	They allow students to use their plan of the lesson they want to learn, helping to organize the information in order to solve it, analyzing the possible relationships between its different parts; the information they want to learn, as well as the types of systems that the student has learned (Monereo, Castelló, Clariana, Palma and Pérez, 2011, cited by Cástulo, 2017).
Elaboration strategies	They are those techniques, methods and forms of data representation that favor the connections between the knowledge previously learned by the subject and the new contents. To this group correspond practices such as taking notes and notes, creating analogies, paraphrasing (Monereo, 1990, cited by, Cástulo, 2017).
Testing strategies	They are those that involve memorizing the contents, either repeating them aloud, copying them or underlining the key parts to then integrate them into long-term memory (Díaz-Barriga, 2010, cited by Cástulo, 2017).
Self-regulation strategies	Self-regulation strategies occur in high-level academic activities, that is, it is a knowledge that is done; it is not declared, but it is realized. It is a procedural and action knowledge (Díaz-Barriga, 2010, cited by Cástulo, 2017).
Evaluation strategies	They are self-assessment processes that contribute to increasing the knowledge that students have about themselves, about the tasks and about the strategies used; They can be carried out during the study of a new topic and/or at the end.(Cástulo, 2017)

Fountain: *Own elaboration from .(Cástulo, 2017)*

It is very important to point out that to the extent that teachers use the greatest number of strategies for learning, their students will show higher levels of satisfaction and cognitive processes are activated to better receive the teaching received.

1.2 Andragogic approach

The andragogic approach in universities focuses on student-centered learning, taking advantage of the student's previous experience and knowledge and promoting autonomy and responsibility in their own learning process. This involves the use of innovative and flexible methodologies that allow the student to build their own learning and apply it to their professional context. According to Collines and Manrique (2019), these strategies "allow the student to be the protagonist of their own learning process, generating a personal meaning in the application of the

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knowledge acquired" (p. 89). The andragogic approach allows teaching staff to provide care based on the individual needs of each subject studying so that they can develop their own pace of learning.

Table 2. Premises of the andragogic approach

Premises	Main features
The self-concept of students	Adults have a vast baggage of knowledge, so it is essential that when working with them their previous knowledge is resumed and they are conceived as beings responsible for their own actions, not as someone who should be directed step by step, that is why the importance of clearly establishing the teaching role and the role of the student who will work in the teaching-learning process.
The role of student experiences	Adults have enriching experiences that must be considered at the time of generating the educational process with them in such a way that they work in a meaningful way, articulating new knowledge with previous knowledge.
The need for knowledge	For adults it is very important to know why they should learn something before learning it, that is, to know what the objective or meaning of this learning is, as well as the benefits they will obtain.
Willingness to learn	This characteristic is related to the usefulness they find in learning, the greater the utility identified, the greater the willingness they present to learn, which is why it is important to link previous knowledge and the interests of adults to increase their willingness to learn.
Learning orientation	The orientation is focused on the life of the adult, so it is advisable to start from their context, from the daily situations they live to link them to new knowledge and that they acquire meaning and meaning for them, and that they can find a use.
Motivation	It is a key factor for the success of adult learning, the motivations that are presented are external as a better job or increase salary, the factors that have a longer duration are internal as increasing job satisfaction, self-esteem, quality of life.

Fountain: *Own elaboration from Knowles (2001), cited by (Veytia, 2015).*

1.2.1 Role of the teacher in andragogy

It is customary within the teaching campuses that generate unilateral situations in the classrooms, even with the organization of the furniture with fixed direction towards the teacher, where the teacher is the main source of knowledge and very far from the relations with his students. This reflects styles of teachers who have refused to update their procedures in the exercise of the teaching profession at the university level. Therefore, the role of the university teacher is fundamental in the teaching-learning process, since he is in charge of guiding, guiding and facilitating student learning. According to Collines and Manrique (2019), the university teacher must adapt to the needs and characteristics of students, "promoting autonomy and responsibility in the teaching-learning process, and encouraging interaction and collaborative work" (p. 94). The university professor must also be updated in his area of specialization, and must use innovative

methodologies that encourage autonomous learning and problem solving.(Arancibia, 2023)

The teacher is obliged to be able to train efficiently in the technological area for the management of digital tools and in the creation and application of different resources that raise the quality of the teaching he teaches, as far as "digital competences are the skills and competences that university professors cultivate in their teaching work and students in the learning process". This type of technological skills are a necessity for the citizens of the XXI century and teaching professionals must walk hand in hand with these advances. (González, 2021)

1.3 Digital tools associated with adult education

The Digital Tools in Education "are the set of applications and platforms that can help both teachers and students in their academic work, facilitating the teaching-learning process, the search and management of relevant information, and digital media for educational purposes" (Martínez, Aguilar, García & Aguilar, 2016, cited by Borjas, 2020). This type of application make up a series of resources that significantly benefit the learning process in higher education students, so that the use of technological instruments, allow the improvement of educational functions, favoring teaching using it as a didactic resource, but also as tools that ensure online services (Rodríguez, 2021). In this order of ideas, the digital tools most used by teaching staff at the higher education level are exposed:

Table 3. Digital tools used in higher education

Digital tools	Use and descriptions
Social Media	The most frequently used social networks are Facebook and Twitter. To promote educational processes, a closed Facebook group can be created where students express their doubts and comments on the topic being addressed.
Forums	They are a tool that is used to create an environment conducive to effective and efficient communication through the use of information and communication technology. Such as Zoom, Microsoft Teams or Google Meet, which allow teachers to give online classes in real time and communicate with students remotely.
Evaluation	Feedback and assessment tools: such as Turnitin, Kahoot or Quizlet, which allow teachers to assess student performance and provide feedback quickly and effectively.
Digital Creation	Digital content creation tools: such as Prezi, Canva or Powtoon, which allow teachers to create attractive and visual presentations, infographics and educational videos.
Blogs	It is a digital diary or an online space that the author updates periodically with entries or posts that are ordered in reverse, from the most recent to the oldest.
Wiki:	It is a website in which several authors collaborate in a line to write, correct, expand and link content -provided that they have been registered- . The word wiki comes from the Hawaiian wikiwiki (fast) and refers to the immediacy with which this computer application allows authors to manipulate the web and publishes
Chat	It is an instant written talk between two or more people in a public place or in a closed room, in which only the chatters enter. In educational contexts, the chat has several uses as dialogue between students and teacher outside the classroom: a formal learning task, a support space, a work in pairs of review or preparation of a writing, etc.

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E-Portfolios	It consists of a powerful database, with a friendly interface, in which the student uploads the materials and the teacher consults them. The material is hosted on the network, on an institutional server, or on the hard drive of a personal computer

Fountain: *Own elaboration, from .(Veytia, 2015)*

2. Methodology

This research had a quantitative approach, due to the way of handling and exposing the data obtained through the sample, subjected to the descriptive statistics with which the variables involved in the work were exposed, in order to determine the main andragogic strategies associated with the digital tools used by teachers (FECYT-UTN) for the improvement of university education. Data collection and management was done through statistical analysis and to verify the behavior of the study subject. (Hernández, Fernández & Baptista, 2014). The depth of the research is descriptive, starting from the theoretical elements that support the study and the form of behavior of those involved related to higher education professionals in Ecuador. We also used the synthetic inductive-deductive and analytical method for the systematic construction of the problematic situation until the generation of conclusions.(Palella, 2012) (Bernal, 2016)

The population corresponding to the study was finite of 350 teachers in the FECYT Faculty of Information Sciences and Audiovisual Media and 1,370 students, as well as a probabilistic sample for each object of study involved of 35 teachers and 137 students of the faculty.(Arias, 2012)

A survey was applied to teachers and students containing 6 closed questions. With a Likert scaling (Always, almost always, never) (Arias, 2012)(Hernández et al, 2014). These surveys were submitted to the evaluation of experts in the area of Education under the criteria of relevance, clarity and coherence (Hernández et al, 2014). Data analysis was performed using percentage contingency tables, making use of descriptive statistics for quantitative data, and frequency tables were organized (Hernández et al., 2014, p. 287).

3. Results

3.1 Analysis of student results

The data of the results of the survey are presented to the students, together with the respective analysis:

Table 4. Do teachers use digital tools to encourage active participation and engagement of students in the learning process?

		Frequency	Percentage
	Never	35	25%
1.	Sometimes	42	31%
	Always	60	44%
	Total	137	100

Fountain: prepared by the authors.

The 44% of students say that teachers always use digital tools to encourage active participation and engagement of students in the learning process, 31% say

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this is sometimes and 25% say they never do. Based on the results, it can be inferred that most of the students of the FECIT, consider that their teachers usually make appropriate use of technological tools so that they participate actively in their training. "HT should be used from active approaches linked to the constructivist paradigm, because from this perspective the student is facilitated in their teaching-learning process, with a role of the teacher as a facilitator and mediator" (Sáez, 2011). A deeper change of mentality is required in university teaching professionals in the use of this type of tools to be more effective in the active participation of teaching with their students.

Table 5. Do teachers encourage collaborative work and the construction of knowledge in students through the use of digital tools?

		Frequency	**Percentage**
	Never	38	28%
2.	Sometimes	37	27%
	Always	62	45%
	Total	137	100

    Fountain: prepared by the authors.

45% of students indicate that Teachers always encourage collaborative work and knowledge building in students through the use of digital tools, while 27% say this happens sometimes and 28% that it never happens. It is evident that teachers in the (FECYT) frequently show that they incorporate digital tools in the promotion of collaborative work, if insistent, the active participation of students in the construction of their knowledge could be increased. In that sense, a professional teacher who has acquired knowledge of technology will seek to change the traditional methods of learning that have been used so far, to create changes in effective and innovative teaching methods. A professional teacher who has acquired knowledge of technology will seek to change the traditional learning methods that have been used so far, to create changes in new and effective learning methods (Cruz, 2018). Being able to include digital tools more frequently in the teaching exercise will be able to favor even more the exchange of ideas and collaborative work among students.

Table 6. Do teachers use digital tools to encourage reflection and self-knowledge in students?

		Frequency	**Percentage**
	Never	40	29%
3.	Sometimes	47	34%
	Always	50	37%
	Total	137	100

    Fountain: prepared by the authors.

37% of the students surveyed indicate that teachers always use digital tools to encourage reflection and self-knowledge in students, while 34% indicate that sometimes they do and 29% state that they never do. These data allow us to infer that teachers in the (FECYT) combine digital and physical resources to promote

reflection and self-knowledge. In this order of ideas, "the teacher is responsible for adapting an environment that provides not only opportunities, but also facilitates the use of technologies for students to learn and communicate" (Unesco, 2008, cited by Sánchez, 2018). In the current university education, with the demands of promoting in students reflection, understanding and self-knowledge, teachers are obliged to include this type of tools that facilitate the interaction of students in the construction of their learning.

Table 7. What are the main digital tools used by university teachers?

		Frequency	Percentage
	Social Media	8	6%
4.	Zoom forums, Microsoft Teams	10	7%
	Turnitin, Kahoot o Quizlet	43	32%
	Prezi, Canva	64	47%
	E-Portfolios	12	8%
	Total	137	100

Fountain: prepared by the authors.

47% of students surveyed say that the Prezi or Canva is the main digital tool used by university teachers, while 32% indicate that Turnitin, Kahoot or Quizlet are the most used for the moment of a quick evaluation, 8% say it is the portfolio, 7% applications for conferences and forums such as zoom and the remaining 6% that are social networks. Many of the digital tools used by teachers are limited to communications that are maintained vertically between educational actors (student-teacher); In this regard, Numerous tools are used outside the videoconferencing room itself, so that students work collaboratively, creating group feeling, knowing new resources and, therefore, developing their digital competence, either in large groups or in smaller groups, depending on the number of students who have attended the session that day. The different digital tools used in higher education become excellent resources to develop the andragogic approach.(Mosquera, 2022)

3.2 Analysis of teaching staff results

Table 8. Do you use digital tools to encourage active participation and engagement of students in the learning process?

		Frequency	Percentage
	Never	0	0%
5.	Sometimes	8	23%
	Always	27	77%
	Total	35	100

Fountain: prepared by the authors.

77% of teachers surveyed state that they always You use digital tools to encourage active participation and engagement of students in the learning process, while 23% say they almost always do. These data allow us to infer that FECYT teachers very often use digital tools with their students to create better participation ties among students and thus increase commitment to study. To support the above,

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"Digital tools allow to promote a more active education on the part of the student, focusing the areas of knowledge for certain times in order to generate works of application of integral content".(Boada, 2019)

Table 9. Do you adapt the use of digital tools to personalize learning according to the needs and learning styles of adult learners?

		Frequency	**Percentage**
6.	Never	4	11%
	Sometimes	17	49%
	Always	14	40%
	Total	35	100

Fountain: prepared by the authors.

49% of teachers say that sometimes adapt the use of digital tools to personalize learning according to the needs and learning styles of adult learners, 40% say they always do and 11% say never. The data allow us to infer that teachers in the FECYT infrequently personalize learning in the university population. In this order of ideas, the digital tools associated with andragogy, "can help adapt the teaching-learning process to the individual needs and preferences of each student, offering resources and learning activities adapted to their level of knowledge, learning style and pace of progress". To cover the andragogic approach of personalization of learning by students, teachers are required to be more committed to the insertion in their teaching style of digital tools that favor them and can thus generate significant changes in the teaching model.(Vera, 2023)

Table 10. Do you provide effective and constructive feedback for students using digital tools?

		Frequency	**Percentage**
7.	Never	4	11%
	Sometimes	22	63%
	Always	9	26%
	Total	35	100

Fountain: prepared by the authors.

63% of teachers surveyed indicate that they sometimes provide effective and constructive feedback for students using digital tools, while 26% state that they always do and the remaining 11% that never. Teachers in the (FECYT) show little interest in this process so important in education at any level, because sometimes they provide effective feedback through digital tools. The feedback requires many skills on the part of teachers and students; They also assert that the most effective forms of feedback are related to the achievement of objectives and provide guidance to learners in the form of video, audio or computer-assisted.(Walss, 2021)

4. Conclusions

Andragogic strategies that involve the use of digital tools can increase motivation and improve students' attitude towards learning, by facilitating collaboration and teamwork, developing creativity and critical thinking, and adapting to different learning styles, among the main tools used by teachers are: Quizlet,

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which is used to carry out evaluations to be developed at the end of the class and Canva or Prezi that are used by teachers to teach their classes as application resources.

The use of digital tools can encourage the active participation and commitment of students in the learning process, since it allows them to access the contents at any time and place, interact with the contents and carry out activities that complement and enrich learning, this type of digital tools in university education should be oriented for reflection on collaborative work and individual development of each student.

Finally, to obtain the potential benefits of the use of digital tools in university education, it is important to design effective didactic strategies that integrate these tools and establish adequate education and training for teachers, so that they can take full advantage of the potential of these tools and improve the quality of teaching in higher education.

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