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EDUCATIVE TECHNOLOGY; ESSENTIAL SUBJECT IN HIGHER EDUCATION

María del Carmen Avitia-Talamantes
Tecnológico Nacional de México/
Instituto Tecnológico de Parral
H. del Parral, Chihuahua, México
https//orcid.org/0000-002-9408-5011

María del Carmen Hernández-Esparza
Tecnológico Nacional de México/
Instituto Tecnológico de Parral
H. del Parral, Chihuahua, México
https//orcid.org/0000-0002-8726-7917

Víctor Hugo Ferman-Ávila
Tecnológico Nacional de México/
Instituto Tecnológico de Parral
H. del Parral, Chihuahua, México
https//orcid.org/0000-0001-7358-7103

Albino Rodríguez Díaz
Tecnológico Nacional de México/
Instituto Tecnológico de Tepic
Tepic, Nayarit, México
https://orcid.org/0000-0003-0963-80463

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INTRODUCTION

The technological evolution of the 21st century offers an opportunity for the transformation of activities in the classroom, through the use of information and communication technologies (ICT). Important innovations have recently been experienced; the design, planning and development of course teaching materials. Education requires new schemes provided by technological tools, in accordance with the new models and theories of learning. It is at this moment that instructional technology emerges, which ranges from the theoretical bases of an instructional design to the final evaluation of learning (Vargas, 2016).

The development of technology has led to the emergence of new educational strategies and tools, as well as the development of knowledge of the way the brain works to optimize learning and add this knowledge to the existing pedagogical and psychological heritage (Forés, 2017). Given these new contributions, teachers in the 21st century need to develop materials and programs that facilitate learning rather than prescriptive programs. (Zabala, González, Fernández and González. 2012).

Continuing education is an imperative in the professional development of the teacher, both in the scientific and in the humanistic aspect. In order to face the high requirements of teacher professionalization, education proposes to implement new forms of communication supported by technologies.

The conception of new ideas establishes a valuable opportunity for its application with the consequent transformation in the educational field. Technology modified the forms of interrelation between humans and their connection with the world. This event has made knowledge available to all humanity.

Constructivism and connectivism are the recent theories of learning, which arise from the new forms of communication. These new theories tend towards self-learning, the development of competency-based programs, ponder the application of knowledge both in daily life and in the workplace. Students need to be trained in science and in new instructional technologies to guarantee the pressing labor demands of the 21st century (Incarte, 2016).

To ensure the insertion of the student in the labor field, in accordance with his academic and professional training, a higher education student close to graduating, after carrying out his professional practices, will skillfully deploy all this action integrating the study plan through the competencies developed as an instructional technologist, both in educational and business environments (Briceño and Orozco, 2016).

The main challenge for the Educational System of the 21st century will be to bring about the required changes in: Educators, the learning structure and its application by students, the integration of the study program both in the specific competences and in the generic: all this as the driving force of the required transformation.

THE PERSPECTIVE OF THE LABOR MARKET IN THE EDUCATIONAL FIELD

An engine of progress in contemporary societies are the scientific and technological advances that are available in the 21st century. Development in all aspects; socioeconomic, political and pedagogical. The educational reality cannot remain behind in the face of the progress emanating from scientific and technological development at all educational levels. In order to face an increasingly demanding society, the higher education level needs to be transformed in keeping with the speed of recent advances in the field of ICT. According to the reports of the Inter-American

Development Bank, unlike other continents, Latin America is identified by insufficient scientific and technological development. This fact slows down the impulse that is required in all social spheres (Zabala et al. 2006).

The application of new technologies covers all areas of society; the world of the 21st century has been transformed through them, be it: Industry, politics, science, research of any kind and education is no exception.

Due to recent realities, a new scenario of academic formation is essential. The best applications of instructional technology will be powerful strategies to remove obstacles to both its introduction and application at higher educational levels (Zabala et al. 2012).

Distance education is gaining momentum every day, especially in the SARS-Cov-2 pandemic. At the same time, face-to-face education demands the use of technology in its academic programs. As technology in instruction advances, professionals in the field of higher education question its effectiveness and feasibility as an educational solution for university students who believe they are under-prepared this way (Martirosyan et al. 2017), despite For this reason, distance education today has broken down any limit in the preparation of a professional through current technological tools, it can be effectively prepared for any area of knowledge, it has even taken advantages over face-to-face training (García Aretio, 2017).

The integration of instructional technology in plans and programs constitutes the greatest challenge for higher education according to Zavarella and Ignash, 2009, due to factors such as the following:

a) The student enrolled online must have high levels of self-regulation, self-discipline and a set of related metacognitive skills.

b) Educators sufficiently trained in the management of technology, who can successfully face the constant new technological applications for educational use and, in turn, the lack of knowledge in this area on the part of their students.

At the higher level of education there is a growing momentum in the use of certain technological devices; The increase in the use and access to the Internet have transformed the educational environment, proof of this is the widespread use of smartphones, 75% of the population has one, a percentage that increases in higher level students and with it the opportunity of use in the school environment.

The use of word processing software, spreadsheets, graphic programs, interactive software for specific topics, software with simulation programs, are some of the most used at the higher level (Ruiz and Danvilla del Vale, 2014). Necessary tools for the generation of knowledge that is part of the competencies required in the labor circle of the 21st century.

School training is decisive in the acquisition of these skills, hence the importance of generating an educational organizational culture in which all people related to learning and application of technological skills in student training are involved (Martirosyan et al. 2017). Technology is an important tool in solving instructional problems as long as instructors are able to identify problems and ways to make technology work.

A large part of educators require confidence in technology, as well as technological skills, a fact that prevents them from integrating it as a priority in student-centered learning. To integrate technology into pedagogical practices, as a priority action at some North American universities, the area of information technology helps professors integrate technology into instruction as well as provide appropriate support to users (Moeller & Reitzes, 2011). "Technological literacy" is a good tool for teachers belonging

to the generation of the so-called "digital immigrants", since they are the ones who present the greatest resistance and fears to the use of technologies. This constitutes a path for technological integration in the classroom. Recent constructivist and connectivist learning theories demand the use of technology (Chang, et al. 2017).

The eminent training will require covering three primary dimensions: Use of technology, instructional perspective, and depth of understanding. This way, technological integration is fulfilled, which includes how it could be used; by the tutor, mediator and a support tool for learning. In such a way that it covers the instructional perspective. This important content comes from the concept of self-learning, demanding the use of technology. There are countless useful programs for the student, which allow them to clarify their doubts, interact with the content and deepen their knowledge. The best practices must be used to increase the cognitive, social and teaching presence in the academic experience.

Before implementing online and hybrid courses, it is necessary to address the challenges of access and technological support. With the increase in the presence of access to mass media, primarily with the use of mobile smart devices, there are applications that instill social presence and collaborative learning, among which are: Videoconferencing, discussion forums, blogs and wikis. Educators must be encouraged to offer the necessary ongoing support of feedback and guidance throughout the course.

Continued research in the field of instructional technology in higher education is a must, as the technology continues to emerge. The commitment of the formation of the educator is a continuous process of technical preparation with a scientific and humanistic formation, which allows him to intervene in the definition and solution of the problems and interpretation of the different realities.

Faced with the challenges that technology has left in all areas of human life, the educator who considers himself successful will have to apply the new skills in the academic process. Contemporary society requests from educators professional updating based on new technologies to contribute the best in the educational process.

The requirements for educators are increasingly comparable to those of the instructional technologist. Demanding fact of an analysis of the scope that represents for an instructor the use of technology in his academic work. An educator belonging to the digital age requires greater actions than the use of technology in her academic work; it is imperative that he bring her leadership and the product of her experiences to the curriculum reviews to positively influence their outcome.

Among the greatest needs in the educational field is the development of instructional material that stimulates self-learning according to the theories of constructivism and connectivism; as well as the development within the student of a series of values that help the selection, discrimination and understanding of the information received (Zabala, 2006).

IMPORTANT CHARACTERISTICS FOR HIRING AN INSTRUCTIONAL TECHNOLOGIST

The main characteristics of a professional dedicated to educational technology according to Longo (2004), would be the following:

- State-of-the-art theoretical knowledge. Versatile, flexible, open and adaptable to constant technological and scientific transformations.
- Restless individual who possesses sufficient neuroplasticity and creativity

to put new knowledge into practice.

- A broad comprehensive thinking that allows you to glimpse the scope that technology provides, both in the biochemical process of learning, as well as the scope in the search for digital information.
- Presents an active leadership that promotes and knows how to work as a team.
- Aware of the present context, plan according to the educational needs of the environment. With a broad vision of the world and the role of educator as a transformer.
- Promote and facilitate new knowledge and its implementation.
- Orient the work towards an intelligent organization, with good communication skills.

The instructional technologist is an informed, current, creative professional to offer the best solutions to an educational problem. He has the elements to find the solution to a pedagogical or instructional problem; with novel proposals, which makes maximum use of personal and institutional resources.

A good selection process for the ideal instructional technologist would be the one proposed in the research carried out by Zabala et al., 2006, which includes direct observation, an in-depth interview, and documentary analysis.

Direct observation by an evaluation committee that verifies the performance of the roles of the instructional technologist through a presentation where he shows his broad and realistic knowledge of both a topic of interest and the use of technology, achieving an instructional objective. Fact that gives the evaluation committee the opportunity to compile the achievement of the objective. If learning through instruction was really achieved through the deployment of their pedagogical and technological knowledge.

With respect to the in-depth interview, their real knowledge is inquired about, as well as their experiences in applying them. The challenges and solutions that as an instructional technologist you have encountered. His expectations regarding the challenges of instructional technology, the type of leadership he presents, his attitudes towards an intelligent organization, the process used to learn about the needs of the environment.

The review and assessment of the documents that guarantee the academic preparation of the applicant, both their formal academic preparation and those that demonstrate the use of skills and competencies as an instructional technologist.

In the evaluation of each one of the stages for the selection of the instructional technologist, the training based on technology, its use and application in educational environments from the search for information and its application in learning, will be fundamental in the determination. Regarding educational production, the diagnosis of needs is valued, training that is carried out between the teacher and the community, the integration of the school into its environment, the link with educational projects (Zabala et al. 2006).

PROSPECTIVE OF THE FIELD OF INSTRUCTIONAL TECHNOLOGY IN EDUCATION

In this Age of knowledge and digitization, innovative leaders are required to develop effective learning models aware of a complex new digital environment. Visionary instructional technologists, capable of facilitating and training in making school decisions that meet the learning needs of

today's student.

Leaders who are aware of technological advances and their educational scope, both in educational training and in the labor and professional field. That they have implemented solutions to previously complex problems, now easy to solve through technological tools.

From the presence of the so-called "exponential technologies" society has changed. These technologies are used in all dimensions of human life, including school training as preparation or training for life. The use of emerging technologies has opened an opportunity in the industry with significant economic potential. Its benefits greatly impact society, both socially and at work. Academic needs increasingly demand the appropriate use for student training purposes, applied to learning techniques. The possibility of using technology for educational purposes is limitless.

The five instructional principles for education proposed by Melleril (2009) are fundamental in improving the quality of teaching (See figure 1): Centrality of the task, demonstration, application, activation and integration (Reigeluth, 2016).

The applications of each of these principles can be seen in Table 1.

The use of technology has surpassed the limits of the mind and facilitates its use in education, as is the case with augmented reality, remote laboratories, the flipped classroom, among many other applications. The use of the cloud has greatly contributed to the rapid change of the application over long distances; used for the transfer of large files, collaborative work, storage and protection of information among others, technological tools available to everyone.

An instructional technologist must be able to use the branches of exponential technologies in the area of their training and in education. Table 2 shows the exponential technologies and their main scope.

DEVELOPMENT OPPORTUNITIES AS AN INSTRUCTIONAL TECHNOLOGIST.

Opportunities are mainly presented in developed countries for this new professional; both in the industrial field for the training of employees, as well as for the training of clients. They are also requested in educational institutions, those that develop distance education, as well as b-learning environments (blended learning).

Instructional Technologists in the educational field are hired to: Collaborate with institutions in the achievement of learning objectives and goals; plan, organize, and provide training to instructors and course administrators on the use of related learning tools and technologies. Apply instructional design principles and best practices to improve learning outcomes; collect, measure and analyze key quality, satisfaction, volume and reliability metrics to inform and improve Instructional Technology Services (ITS); form networks with other universities to share and obtain knowledge (My. Jobs, 2018).

Instructional technologists are required to redesign and transform training into modern, technologically enabled, instructive and engaging learning experiences. Among the activities for which they are hired are: 1) Manage instructional design projects, providing individual contributions as necessary to ensure delivery on time and within budget. 2) Manage and train the instructional design team. Establish team goals and objectives aligned with corporate goals and objectives. 3) Gather and analyze requirements to design and develop solutions to address business needs and opportunities and propose changes that enhance the learning experience. (Carbon Black, 2018).

Another of the requirements is to design,

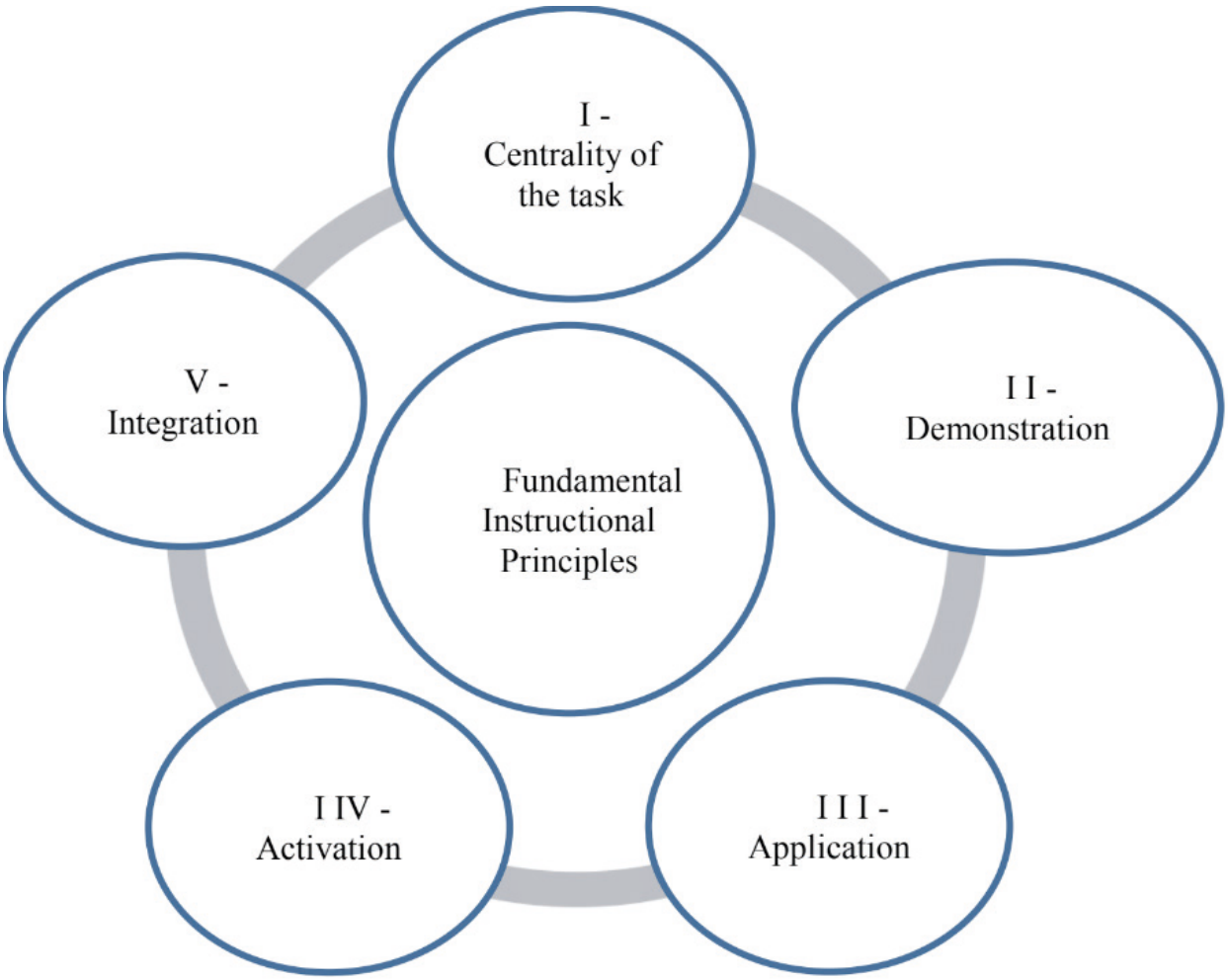

Figure 1.- Fundamental Instructional Principles

• Task-focused teaching strategy • Progression of increasingly complex tasks • I –Task centrality	• Provide skills (what is, what is done, what happens in the execution) • Orientations to relate the particular to the general • Discussion and demonstration. • Observation by media according to the content • II -Demonstration	• Concordance between skill and application • Consubstantial feedback as corrective • Provide entertainment, which gradually decreases • Involve in peer application • III -Application	• Activate relevant cognitive structures • Share previous experiences • Construction of scaffolding to organize new knowledge • IV -Activation	• Knowledge through reflection, debate and defense of knowledge. • Analysis and criticism among equals. Achieve in students. • Creation, invention or personal exploration. • Public demonstration of their new knowledge. • V -Integration

Table 1. Fundamental Instructional Principles and their application (Reigeluth, 2016)

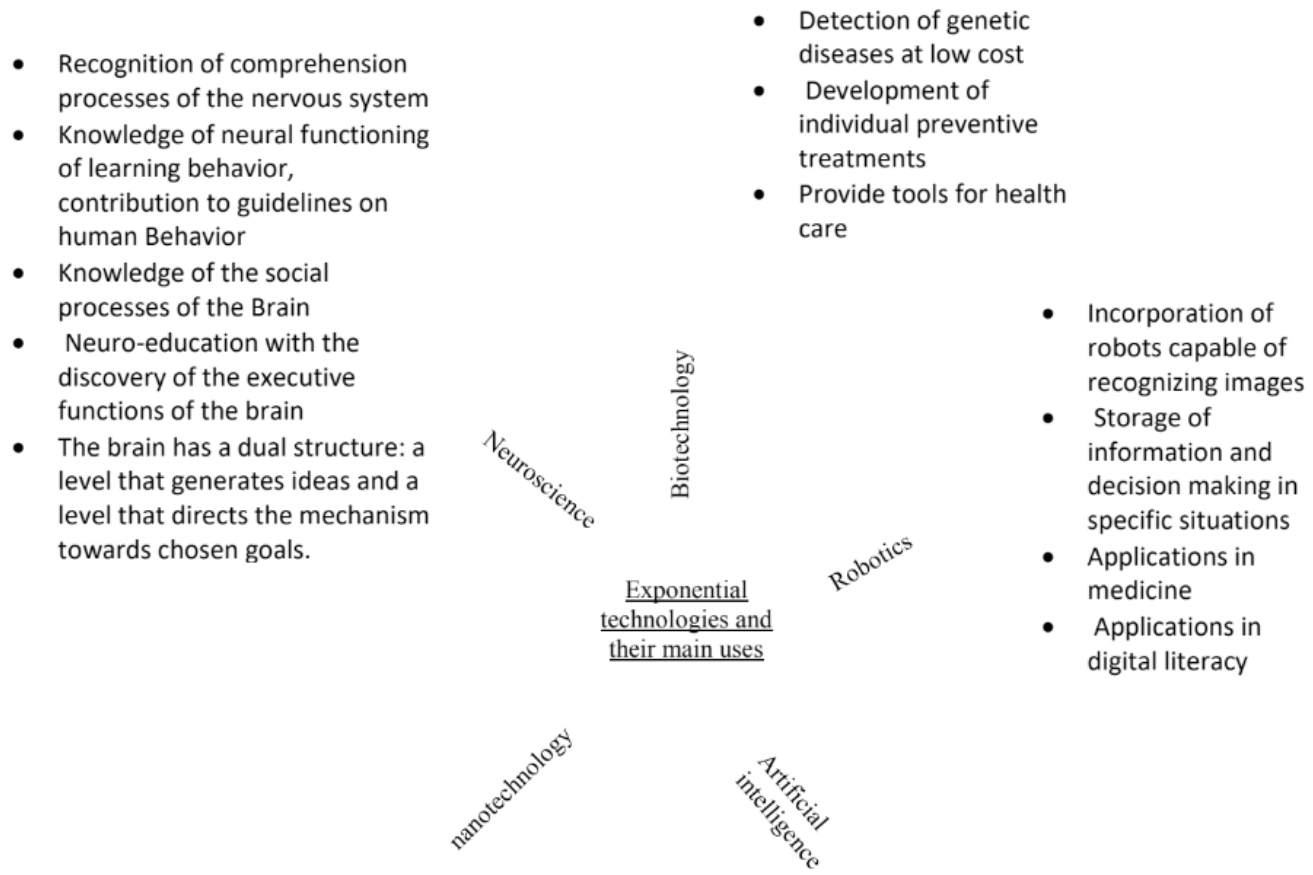

Table 2: Exponential and main technolo nanotechnologygies aplicaciones.

develop and implement online eLearning courses at an advanced level. The courses provide students with the information, skills, and strategies necessary to assist clients with implementation, follow-up, and training. The generated courses must be interactive and interesting, based on the design and development of eLearning and instructional design. Apply adult learning methodologies and best practices to create asynchronous learning as required by product and service training. Work with curriculum designers and subject matter experts to identify the course description, learning objectives, content, and eLearning activities. Create eLearning experiences based on scenarios, interactive informative briefs. Implement feedback effectively and efficiently. Import audio files into finalized and edited instructional materials as required. Maintain an open line of communication with team members to ensure consistent and accurate course development. Thorough familiarity with and ability to apply adult learning instructional design principles, strategies, theories, and methodologies to various types of projects.

Experience with designing and usable content and publishing online training for different platforms, including: web, smartphones, tablets, and many more. Ability to create measurable objectives, based on the needs of the audience. Ability to work in a virtual environment. Demonstrate proficiency in the use of various applications, including Microsoft Office, Articulate Storyline 360, Snagit, Photoshop, and more. Ability to work effectively under the pressure of time constraints and challenging deadlines in a fast-paced, complex, rapidly changing, innovative, energizing, collaborative, team-oriented environment (Houghton Mifflin Harcourt, 2018).

CONCLUSIONS

A professional dedicated to instructional technology in the educational subfield will have to be related to the planning and execution of educational programs based on the new technological media that are more and more evolved every day. Belonging to a learning community fueled by the opportunities offered by technology is to a large extent the path of updating and professionalization for that teacher who wants to stand out as an instructional technologist.

To achieve the desired educational success, the people dedicated to Instructional Technology will have to be able to determine the instructional needs: Investigate the target population, the position of the educator, the limitations of the context and the environment; the analysis of instructional problems to find the appropriate solution; the appropriate selection of instructional strategies product of intelligent and reasoned reflection; the appropriate formulation of innovative projects and proposals that contribute to Instructional Technology; the design of didactic material and attractive learning environments for the students of the new generations, that excite them to learn. As well as the evaluation of the effectiveness and efficiency of the implementation of instructional technological strategies.

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