

Implementation of Instructional Design Models without Considering Inclusive Education

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Abstract: At present, education is a matter of global concern and it is the responsibility of all States to be able to provide the ideal conditions so that it is accessible to the entire population. As indicated by one of the objectives of the 2030 Agenda which seeks to guarantee inclusive and equitable education quality. Different studies indicate that instructional design models allow the creation of optimal educational environments for all people and that their correct application allows students to generate satisfactory learning, however, there is an important group of people who are not considered in the tests of these models making it impossible to reach the goal of achieving the desired educational inclusion. Therefore, the stated objective is to demonstrate that people with some type of disability have not been considered to work and to validate the studies that use different models, approaches or techniques to develop virtual learning environments. The results are worrisome as they demonstrate that of the 90 scientific articles analyzed, only 4.44% have included topics related to disability and of the total sample of participants that total 11,732 people, only 42, that is, 0.36%, had some type of disability. This shows that we are very far from being able to meet the sustainable development goal that seeks to guarantee inclusive and equitable quality education. Based on the results achieved, it is intended to sensitize governments, educational institutions and teachers around the world to work responsibly to close the gap that marginalizes people with disabilities and build appropriate virtual learning environments that guarantee that everyone can access and learn in the best way.

Index Terms: Inclusive Education, Sustainable Development Goals, Instructional Design, Accessibility, Virtual Learning Environments

1. Introduction

Since 1948, education has been regarded as a human right [1]. According to Aristotle, "those who educate children are more to be honored than them who produce them; for these only gave them life, those the art of living well", In the aforementioned framework, the right to education is a crucial tenet of everyone's development and, consequently, of societies' ability to accomplish economic, social, and cultural development [2]. This has made several organizations start hard work several years ago to ensure that education reaches all people, especially in those forgotten regions with

scarce resources and in places where, despite having an adequate environment, they have not included vulnerable people in their schooling plans. In this first part, the objective is to highlight those programs that have made it possible to change the aforementioned reality and that have contributed to start the path that allows providing quality education to all people. In this context, in 1990 the international community initiated the Education for All (EFA) program promoted by the United Nations Organization, whose declaration, consisting of 10 articles, was expected to meet the basic learning needs of children, youth and adults.

A program known as the Dakar Framework for Action was started in 2000, but despite reporting great progress, it failed to achieve the intended goal throughout the course of its 15-year implementation [1]. With 17 goals and 169 targets, in September 2015 the 193 members' states of the United Nations, together with many actors from civil society, academia and the private sector, engaged in an open, democratic and participatory negotiation process, which resulted in the proclamation of the 2030 Agenda for Sustainable Development. The agenda aims to eradicate poverty and uphold everyone's right to an education, with an emphasis on the needs of people with disabilities in the context of development. It recognizes that people with disabilities are among the most vulnerable groups and calls for their empowerment [3].

The educational process currently demonstrates a clear interest in having the essential pedagogical and andragogical components to examine participants' performance in various educational environments, as well as their learning. In this case, instructional design allows to generate the interaction between the learner, the teacher, the content and its context [4], determining which instructional methods are appropriate to carry out the desired changes in the knowledge and skills of students within a course and a specific study population. Curriculum and instruction are different because while curriculum is primarily concerned with what to teach, instruction is primarily concerned with how to teach it, according to [5]. Neglecting these concepts has caused most of the educational institutions to consider as the most important thing only to update and improve the content taught by their teachers, but they have neglected how they should be taught, generating a very big problem because they are not considered the different skills and abilities that each of the students must learn. The importance that instructional design has as a professional activity is not being understood, making a simile, it is like the architect's blueprint in the sense that it presents a "model" on the instructional methods that will be used when addressing the content of that course and for those students [6]. These two aspects are essential for the teacher to master the correct way of imparting the content and that this content is appropriate for each of the students with whom he works, otherwise the learning process will not have the desired success or will not be successful. cash for everyone. At this point, the reviewed literature successfully demonstrates the application of different instructional design models at different educational levels but neglects the participation of people with some type of disability, evidencing that we are very far from the much-desired inclusive education.

As of March 11, 2020, the World Health Organization (WHO) proclaims a COVID-19 pandemic, which will restrict people's mobility and physical proximity in social and professional settings. Under this scenario, educational institutions were compelled to put a halt to their face-to-face teaching and learning processes and adapt them to a virtual format [7] achieving that the learning processes are not paralyzed, however, it also exposed structural deficiencies, connectivity issues, a lack of technological resources, and inadequate teacher and student preparation for using these resources. Inequity in access and advancement throughout the academic trajectory, as well as a lack of accessibility to educational platforms, were discovered [8]. The happened because of not all institutions being equipped for virtual learning and adapting to what refer to as "emergency remote teaching" [9] which compelled education to undergo a fundamental transformation and evolution of the traditional classroom. Although the use of smart classrooms is currently manifested, found that using high-tech devices alone is insufficient to increase learning efficiency [10]. This is particularly true if there is a disconnect between how students engage with and experience technology in their personal and social lives and how they employ it in their roles as learners [11, 12].

The ODS4 of the 2030 agenda aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". The rights of people with disabilities, who make up one of the most at-risk and steadily growing demographic groups, are prominently highlighted in this purpose. According to the most recent United Nations report on disability, 15% of the world's population, or more than one billion people, live with a disability [13]. Although there are different alternatives that allow the creation of inclusive educational environments based mainly on compliance with standards and regulations such as WCAG 2.0 that define how to create more accessible web content for people with disabilities and ISO 9241-171 that provides guidance on software design of interactive systems so that they reach the highest level of accessibility possible, these are currently insufficient because they only offer a minimal solution and, unfortunately, no useful updates have been suggested considering the context of accessibility related to people with disabilities [14].

The main objective of this research is to show that there is a large number of studies that implement e-learning systems that develop their contents based on the principles postulated by the different models of instructional design, and that despite this, most do not contemplate any of its development phases, aspects that lead to achieving a true inclusive education and even less is the direct participation of people with some type of disability evident, which guarantees that educational environments for all are being considered and that they comply with the principles of "leaving no one behind" and "reach the furthest behind first. Through the proposed research questions, it is expected to collect the necessary information that allows, based on the analysis carried out, to validate the proposed objective. The questions are:

Q1. Which development environments are most frequently used to implement e-learning system courses?

Q2. What models, approaches, and theories are used to create environments for implementing courses on e-learning systems?

Q3. What are the benefits/disadvantages of current instructional design models developed for e-learning systems?

Q4. What are the most significant effects on accessibility of using instructional design models in e-learning systems?

2. Literature Review

It is important to highlight how the use of technology is rapidly becoming popular worldwide, education from the COVID 19 pandemic is perhaps one of those that have been able to take advantage of its advantages the most since it has become essential to provide significant advantages over education. traditional, modern society finds significant ease in accessing the Internet and technical equipment, making it an integral element of everything from education to entertainment [15]. The following literature highlights the importance of education, contributing significantly to corroborate our initial objective and from this highlighting that the inclusion of technology in education helps to improve the learning process, however, it also shows the little preparation that students have to use it, although they use technology in daily life when applying in education there are major drawbacks that cause desertion.

The World Summit on the Information Society (WSIS) recommends the use of ICT at all levels of education, training, and human resource development [16]. The development of electronic learning, often known as e-learning, which is nothing more than those ICT-based programs and services intended at facilitating the teaching-learning process, is in fact a result of the integration of technology into education [17]. However, because the roles of teachers in an online environment differ greatly from those that they have traditionally played in a classroom context, the impact of technologies on learning and teaching in general remains unclear and has not yet been the subject of extensive debate or in-depth research [18]. But even more crucially, there appears to be a discrepancy between how students use technology in their academic duties and how they use it in their personal and social life. This demonstrates that many people lack the independence needed to create their own programs and manage their studies independently. Less than 10% of students complete well-known MOOCs as evidence of this [19], showing that most students, especially undergraduates, require significant assistance, support, and counsel throughout their learning process [18]. It is necessary to emphasize that if children and young people efficiently use technology for leisure, and have problems carrying out their academic activities individually, the problem does not lie in the technology, but rather it is most likely that the way in which virtual learning environments are being created are not adequate and an urgent restructuring is needed.

The literature also details instances of low student involvement in traditional education, when the teacher frequently observes that, out of fifty students, only two or three are paying attention to what is being taught while the others are talking, fidgeting, using cellphones or even sleeping. At the same time, many university students complain that it is unpleasant to follow lectures, as they evaluate them as boring and disconnected from real life or practical applications. Many students will say they can't remember if asked what they learnt several months later [20]. In this sense, the different models, frameworks, methodologies, and other existing development environments must propose solutions to the various problems in the face-to-face or virtual training of people linked to initial, basic, secondary and/or higher education to minimize the previously mentioned scenarios. As described, in this sense, the contribution that this work seeks to show is the necessary application of instructional design models that allow inclusive educational environments, thought of all people, with adequate resources for all and that allow them to develop their own learning. In addition, it is necessary to look at new approaches and seek effective solutions so that the teaching and learning processes give more value to what the student applies, and thus eliminate obsolete ideas that gave the student the unique role of receiving knowledge without its important role in the learning process [21] is noted, much more so when there are students with some type of disability in the classroom, digital resources are called upon to contribute and facilitate the way in which they learn. That is, to make use of the reality that the vast majority of students in today's classrooms are digital natives and can be taught using the STEAM model's learning-by-doing approach. The aforementioned paradigm is a successful method of instruction, making it possible to implement, among other things, projects based on inquiry that positively affect learners' perceptions of and retention of abilities [22].

One of the most effective and proven mechanisms for ensuring that peoples flourish sustainably is education. Therefore, it is imperative to immediately implement changes to education policies at all levels and, more importantly, to use instructional design models that consider the most vulnerable people, especially those with disabilities. This is true whether the educational process is face-to-face, virtual, or combined [23]. Working to ensure inclusive education that considers society as a whole in addition to schools as a physical location is vital. The aforementioned goal is not only to integrate students with disabilities into regular classrooms, but also to change schools so that they are more receptive to the needs of all students [24]. This is especially true in recent years, when the number of students with disabilities enrolling in schools is steadily rising, forcing teachers, particularly those in higher education, to feel the urgent need to create instructional materials that work on accessible platforms [25].

If we have more and more students with disabilities entering the different educational levels, it is urgent that the role of teachers today is focused on creating the right environment to guarantee their learning. The term instructional design that refers to the systematic and reflective process of translating the principles of learning and instruction into

plans, materials, activities, information resources, and assessment [26] should be used in different subjects to create a digital culture that provides learning facilities for everyone.

The instructional design models most mentioned in the reviewed articles are the Gagné instructional model, the ADDIE model, the ASSURE model, the Dick & Carey model and the Kemp instructional design model, it is also evident that some of the models cited if they propose in their implementation phases the analysis of the student prior to the design of the resources with which they must work in the classroom or through digital platforms, however, the authors during the development of the proposed works do not consider this or if they do, they do not validate their application correctly, which shows that the proposed model is not being used satisfactorily.

Therefore, it is important to understand the difference between curriculum and instruction as research areas, and how it should be applied so as not to make mistakes during implementation. The curriculum focuses on what to teach, that is, what contents are appropriate for a given subject and this is done adequately since educational institutions often adopt what the higher education organizations in each country define, the problem begins when the instruction should be applied, which focuses on how to teach, although this depends on the teacher, it is here where what the different models of instructional design propose should be considered, but unfortunately, it is precisely here where the vast majority fail, causing the problems described above [27].

Complying with the instruction process requires completing the process, that is, designing, developing, implementing, managing, and evaluating at its most basic level, failure to comply with this would affect the expected success, the different instruction criteria are shown in Figure 1. Understanding, enhancing, and putting into practice teaching approaches are all part of instructional design. It is the process of deciding which instructional methods are best for effecting the desired changes in students' knowledge and skills for a specific course content and a specific study population [5].

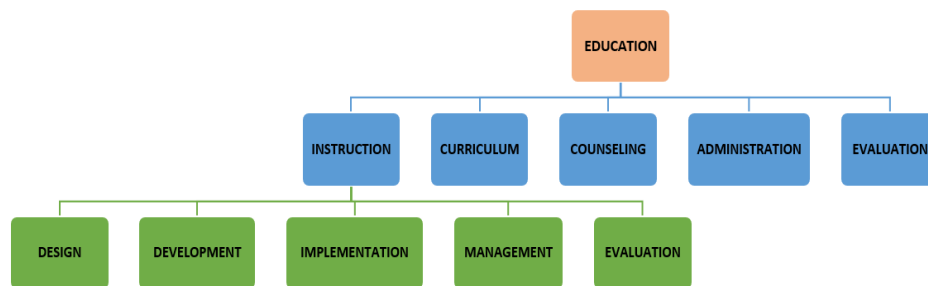


Fig. 1. Relationship of instructional design with other areas of research within education.

Despite the enormous number of researches, the concept of disability has been and is still the subject of intense discussion. As a result, it is hard to explain disability using only one model or definition [28]. The medical model's approach, which views disability as a problem of the person and directly caused by a disease, impairment, or other health condition, stands out from the reviewed literature. It considers that individuals with disabilities need medical attention in the form of treatment that enables them to achieve a cure, better adaptation, or behavioral change [29]. The social model, on the other hand, sees disability as a socially induced problem. That is, disability is not an attribute of an individual, but a situation in which society invalidates and prevents people with disabilities, resulting in these subjects being unnecessarily isolated and excluded from actively participating in society. According to the prior paradigm, it is the duty of society to create the necessary environmental changes to enable persons with disabilities to fully participate in all facets of life [30].

3. Methodology

The important thing about carrying out a systematic literature review (SLR) is to be able to obtain the greatest quantity and quality of evidence (primary studies) related to a specific topic of study. In the present investigation, the methodology to carry out the SLR is based in the guide proposed by Kitchenham and Charters, considered one of the most reliable and used in the scientific field by different authors to validate their systematic review processes.

Following the systematic review protocol, it was possible to identify the most relevant primary studies in a range of six years that used instructional design or educational models to create e-learning platforms and took into account the issue of accessibility, in a publication range from 2015 to 2020, from that, an exhaustive evaluation of all the works found was carried out applying mixed methods, which, within the field of research, imply collecting, analyzing and integrating qualitative and quantitative methods in a single work, as cited [31], then the information from the selected works is interpreted and finally it is synthesized to present the most relevant findings that allow validating the proposed objectives and solving the research questions posed. This process guarantees that the results achieved meet high levels of reliability and precision, since the process by which they are obtained is correctly validated by the scientific community.

The review process, which is detailed in Table 1 outlines the criteria utilized in the searches, was developed to formally state the findings of the study for the four targeted topics. The scheme was proposed by Kitchenham and Charters [32] in the document on guidelines for conducting systematic literature reviews in software engineering.

Table 1. Literature review protocol.

Criteria	Detail
Keywords	Instructional Design Models, Accessibility, Hearing impairment, E-learning, ("Human-Computer Interaction" OR "HCI"), ("Universal Design for Learning" OR "UDL")
Search strategies	Search by key terms in databases: Scopus, IEEE Xplore, Springer Journals.
Key search terms	The keywords selected for this study.
Search in:	Title, Abstract, Keywords
Selection Inclusion / exclusion criteria	Inclusion: - Research areas: "E-learning", Sub research areas: "Computer Science", "Social Science", "Engineering", "Education", Works published in language: All languages, Full text, Article, Conference Paper and Book Chapter, Works that are considered relevant, for which the "Relevance" calculated by the different databases, the number of citations and that it is in the expected date range are considered. Exclusion: - Off topic: Papers not directly related to the topic of interest. Duplicate: Papers whose main contribution was considered in other papers. - Out scope: Work that is out of range of interest.
Classification groups	"E-learning" / "Accessibility" / "Instructional Design Models" - Type of publication: Scopus: Article, Conference Paper y Book Chapter IEEE Xplore: Conferences, Journals & Magazines Springer Journals: Article
Tools	- Search log, results and analytics: Excel - Reference management system: Mendeley

The search strings created are displayed once the criteria used for the searches in the various databases have been established in Table 2. It should be mentioned that only the Springer Journal database's search using the keyword "Accessibility" was carried out because the results from the searches in the other databases were insufficient for analysis.

Table 2. Search strings used.

Database	Search strings
Scopus	TITLE-ABS-KEY (((("Model" OR "Instructional Design Models") AND "e-learning") AND (("Human-Computer Interaction" OR "HCI") OR ("Universal Design for Learning" OR "UDL"))))) AND (LIMIT-TO (PUBYEAR , 2020) OR (LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015)) AND (LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "ch")) AND (LIMIT-TO (SUBJAREA , "COMP") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ENGI"))
IEEE Xplore	(((("Model" OR "Instructional Design Models") AND "e-learning") AND (("Human-Computer Interaction" OR "HCI") OR ("Universal Design for Learning" OR "UDL"))))) Filters Applied: 2015 - 2020
Springer Journals	'((((("Model" OR "Instructional Design Models") AND "e-learning" AND "Accessibility") AND (("Human-Computer Interaction" OR "HCI") OR ("Universal Design for Learning" OR "UDL"))))) ' within Computer Science Article 2015 – 2020

The first set of articles to be reviewed was obtained using the search phrase that had been established for each of the databases. The databases taken into consideration in this analysis revealed a total of 256 records as of December 1, 2020. The following review filters are applied to the generated scientific papers. The total number of documents before and after the corresponding analysis are shown in Table 3.

Table 3. Number of studies per database.

Database	Documents per database	Final documents
Scopus	136	09
IEEE Xplore	15	04
Springer Journals	105	03
Others	08	08
Total documents	264	24

3.1. First filter

- Title: Each title of the publications reported by the databases is reviewed.
- Summary or Abstract: The abstract is read while taking three primary factors into consideration: the proposal, the application, and the results. The studies pertinent to the suggested research topic are gleaned from the analysis.

3.2. Second filter

Full text: Following the initial filter, the 16 papers are read and thoroughly analyzed. It should be mentioned that eight additional study documents were not visible in the databases where the search was conducted, but they were taken into consideration anyway owing to their significance and contribution to the study.

4. Results and Discussion

In this section, the results of the systematic literature review are presented, the research questions are answered and the main findings are presented.

4.1. Q1 Which are the most used development environments to implement courses on e-learning systems?

Education is one of the fields where technology is most prominent. The writers utilize different criteria, but they all agree that e-learning system implementation environments are the most used development environments. They all share a common goal: to enhance teaching and learning processes using accessible technology components and, in addition, to enable significant advancements in other fields.

The marked tendency in this sense is that the development environments allow the implementation of a solution that can be easily adapted to the learning needs according to the institutional environment, the teaching criteria, and the abilities of the student sector.

The answer to question 1 clearly shows that in most of the studies the instructional design model is used as the development environment, which makes it possible to meet the current demand for e-learning. The classification according to each criterion is shown in Table 4.

Table 4. Number of studies per database.

Framework	Instructional design model	Method / methodology	Comparative study
3 documents	14 documents	3 documents	7 documents

4.2. Q2 What are the models/methodologies/theories you rely on to create development environments to implement courses on e-learning systems?

Every development environment is built on models, methodologies, or theories that have been put to the test and provided positive outcomes. Researchers are constantly looking for ways to integrate and enhance development environments so that they are functional and enable the achievement of educational goals. All of the features described are included in the classification since some of the documents under study give an evaluation or comparison of various models, methodologies, or theories. For this reason, Table 5 shows how the models, methodologies and theories proposed many years ago are still in force to create current development environments.

- Within the HCI environment, development environments such as Virtual reality, Game learning and Immersive virtual worlds are cited, while Machine learning is cited as a subfield of Artificial Intelligence (AI).

- Among the most cited models and methodologies are E-learning Model, DeLone and McLean Success Model, PRISMA Methodology, FERT Architecture, MDE.

- Although in this question the different options have very similar values, theories and learning styles are those that represent the highest number reported in the documents analyzed. This result is very significant since these environments are called to contribute to the creation of inclusive virtual learning environments, since they consider starting with an analysis of the student and based on the results, building the appropriate resources for their learning. The main theories and learning styles cited are Bloom's Cognitive Process, Gagné's Theory of Learning, Felder-Silverman Learning Styles Model, Constructivist Theory, George Siemens' Theory of Connectivism, Cooperative Learning, Behavioral Theory and Cognitive Theory.

Table 5. Studies cataloged according to the models/methodologies/theories used for the creation of development environments.

HCI / UDL / TAM / IA	Model / Methodology / Architecture	Theories / Learning styles
10 documents	9 documents	11 documents

4.3. Q3 What are the benefits/disadvantages of current instructional design models developed for e-learning systems?

Each model has benefits and disadvantages, which are frequently a function of how it is employed and the audience it is aimed for. Like obtaining the optimal outcomes in the teaching-learning process depends on factors like the technology resources available and the competence teachers have to handle the EVA. Table 6 indicates the benefits/disadvantages noticed during the tests carried out by the researchers in different work situations, which is why they may be considered a guide to be considered when selecting a particular instructional model. The authors of the research under consideration make the following recommendations regarding the various models reviewed in an effort to enhance their value to the educational process. It is advised to:

- Consider aspects such as cognitive structure, cognitive style, perceivable preferences, among others in students.
- Review the relationship between the strategic objectives and the tasks associated with them.
- Perform possible adaptations in the model in order to make it work in a mobile context.
- Explore the use of technologies that simulate the face-to-face scenario.
- Integrate a pre-analysis phase.
- Include a strong focus on preparation and organization prior to implementation.
- Increase teacher training and student training.

Table 6. Benefits and disadvantages found in the use of instructional design models to implement e-learning systems.

Aspect	Description	Studies
Benefits	Improve training, satisfaction, understanding, performance and learning effectiveness.	14 documents
	Improve and enhance motivation, confidence and positive attitudes.	9 documents
	Adaptability of the method to be combined with other models and adjusted to the needs.	18 documents
	Analyze student characteristics.	7 documents
	Include regular communication for the exchange of experiences.	7 documents
	Consider accessibility issues.	6 documents
	Contribute to learning in virtual environments.	10 documents
Disadvantages	Teachers and students have insufficient knowledge in the use of ICT (E-learning). It requires a great deal of training on the part of the participants.	10 documents
	No clear standards are considered for academic production and self-evaluation.	4 documents
	Insufficient internet access.	2 documents
	Tests in larger educational settings are still to be conducted.	4 documents

4.4. Q4: What are the most significant accessibility implications of applying instructional design models to e-learning systems?

"States should recognize the principle of equal educational opportunities at primary, secondary and higher education levels for children, youth and adults with disabilities in integrated environments, and should ensure that the education of persons with disabilities is an integral part of the education system" [33]. According to this assertion, it would be reasonable to anticipate that individuals with disabilities would actively participate in the educational process and studies in which these individuals are a crucial component would demonstrate the effectiveness of the use of technology, models, methodologies, or other evaluated environments. Unfortunately, the reality is quite different.

This paper's prescribed reading, [34], provides an analysis of the use and evaluation of sixteen instructional design models used at various educational levels. Seven models were chosen from the review that was conducted that combine different case studies and practices, with a particular emphasis on those that take place in a virtual environment, along with additional scientific papers that were used to address this research questions.

The analysis for question Q4 is conducted on a total of 90 scientific papers from 28 different nations, with a sample size of about 11,732 participants. Many of the participants were students, very few teachers and parents. The analysis carried out on 90 (100%) publications reveals that only 4 (4.44%) mention issues related to some type of disability, evidencing that this topic is not considered by most researchers.

This reality unfortunately demonstrates what was stated in this study, even though different institutions are struggling to achieve inclusive and quality education, the efforts will be in vain if educational institutions and their teachers do not update and improve the way they teach their classes. Nothing will be possible if the states do not propose policies to allocate adequate budgets to better prepare teachers and improve the physical infrastructure and now also digital, nothing will help if all people do not assume the responsibility that children, young people and vulnerable people are participate in their right to education. It is necessary to act and change the situation shown in Figure 2.

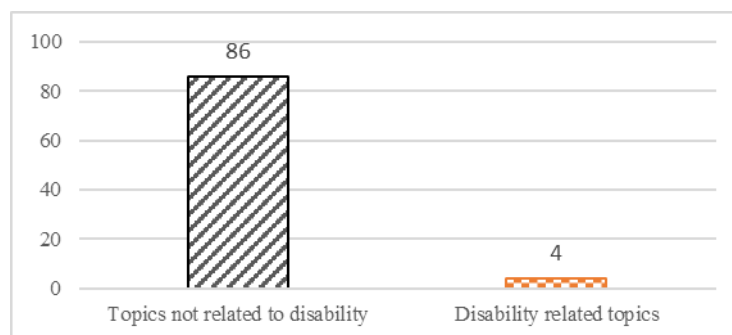


Fig. 2. List of scientific studies that include topics related to disability.

To complement the previous data, the samples of all the publications that were evaluated are added, there is a total of 11,732 (100%) participants, of which only 42 (0.36%) of the total sample were people who presented some type of

disability.

Considering that inclusive education aims to guarantee that all people, regardless of their abilities, needs or disabilities, have access to quality education, it is evident that people with some type of disability are a small part of the sample considered in the studies analyzed. It demonstrates a worrying reality that this important group of people lives, for whom it is very difficult to access the digital resources developed without considering concepts of accessibility and usability that allow universal access. This great difference can be seen graphically in Figure 3.

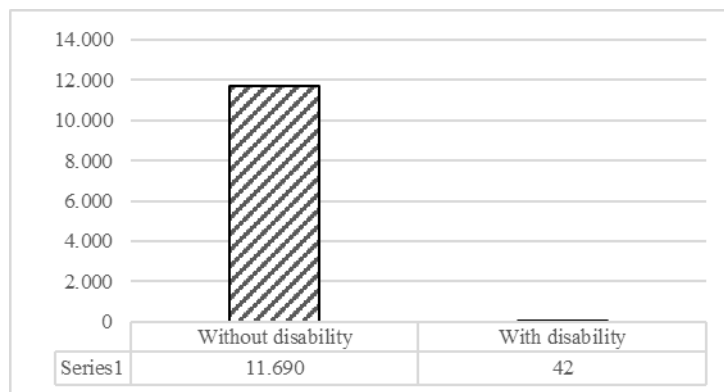


Fig. 3. List of participants in scientific studies who have some type of disability.

It is important to indicate that there are studies that include aspects related to disability, apparently to gain notoriety, since at the time of carrying out the validation tests, there is no evidence of having worked with people with disabilities to validate their work, such is the case of the article proposed by [35] that offers some interfaces that consider the different types of disabilities, however, the tests are carried out with experts and without the participation of people with disabilities.

A similar case occurs with the article presented by [27] which mentions the use of UDL so that each lesson developed is accessible to all students, it does not provide any evidence based on metrics to support this statement. The same as the previous cases occurs with the research carried out by [36] in which it is detailed that their project is useful so that students with dyslexia can learn better and the work of [34] that offers an adaptive paradigm for students with dyslexia hearing disability, in both cases tests are not carried out with the type of students indicated in their publication.

This situation is very worrying because there may be more cases of scientific papers that use disability to position their publications in impact journals, but that are not fulfilling the purpose of improving the learning process of vulnerable people or who have some type of disability.

Unlike the previous ones, it's important to highlight the work [14], it's the only one indicates that the study is conducted with the participation of 42 people with visual impairment (blind, low vision, deaf) who are on average 24 years old and presents figures where participants are very satisfied with the results, indicating satisfaction rates equal to 5 out of 7 and the measured usability of the system is considered good. They also propose the inclusion of instructional design models in e-learning systems since their tests which they carried out with the aid of individuals with visual impairment were very successful.

Based on the results presented in this paper, its importance can be highlighted by showing the small number of people with disabilities who participate in research activities that lead to the creation of virtual courses specifically focused on the problems that arise when a person with disabilities access different educational environments on e-learning platforms.

This must provoke a majority reaction in all the people who oversee educational institutions at all levels to work together and make physical spaces and digital platforms increasingly inclusive, demonstrate that there is the will to be able to make education truly for all.

5. Conclusions

The work carried out by different institutions and governments to ensure that education can reach all people unfortunately has not been able to meet the objectives set, even less has significant progress been made to guarantee inclusive and equitable quality education. Much remains to be done and the joint work carried out by all the actors in the educational process will be essential to achieve better results, otherwise, the gap in education will continue to grow and the objectives will be more complex to meet.

Instructional design models have marked an important trend in the objective pursued by educational institutions to create appropriate physical and electronic pedagogical scenarios that allow teachers to better impart content and students to optimize their learning considering their abilities and strengthening their stake.

E-learning from the COVID-19 pandemic has managed to position itself and become an alternative that many educational institutions currently maintain in force and that is used by many people for their training due to its proven

advantages. However, it is evident that a large part of the classrooms created only meet the minimum accessibility criteria and do not consider a design that allows access to information to be available to all people, the results show that most of the works do not consider work with people with disabilities to validate and guarantee that the criteria that allow the much-desired inclusive education to be achieved are met.

A worrying reality found through the results achieved when carrying out a systematic review of literature that shows that of ninety scientific papers related to the application of instructional design models to create virtual learning environments, only four that represent 4.44% of the sample covers issues related to disability and of these works only one ends the instructional process by evaluating the results with 42 people with visual disabilities that are equivalent to 0.36% of the sample, demonstrating the little interest of the authors to create virtual learning environments accessible.

The present investigative work shows a sad reality that does not allow progress in the objective of providing quality education to all people. Considering that the results are the product of a systematic review of the literature with a cut-off of the year 2020, it is very likely that the reality is different after the effects caused by the COVID-19 pandemic that caused a massive migration to electronic systems and mandatory improvement of Virtual learning environments. Therefore, a study opportunity is opened to demonstrate the current reality and propose solutions from the academy that improve the results presented.

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