

Digital citizenship: Meta-analysis of research in Mexico

La ciudadanía digital: metaanálisis sobre investigaciones en México

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ABSTRACT

Keywords

Meta-analysis;
digital citizenship;
digital society;
ICT appropriation;
lines of research

The present study was a meta-analysis compiling research on digital citizenship conducted in Mexico in 2011 - 2023. It was guided by the objective of arguing, analyzing and categorizing the lines of knowledge generation and application (LGAC) related to digital citizenship in Mexico. The methodology applied was meta-analysis where 88 research studies were documented: 47 papers, 33 journal articles and 8 theses. The studies found support the existence of six LGAC in Mexico. It was concluded that the studies are related to understanding the way in which society appropriates digital technologies, interactions through social networks and the manifestations of digital identity. Another point to highlight is that the study of digital citizenship has been used to analyze the acquisition of digital skills and attitudes, social issues addressed by digitalization, the roles played by educational actors in the virtual environment and the promotion of multiculturalism. The studies found provide relevance to the LGAC, and allow concluding that digital citizenship is a topic present in research on educational technology in Mexico.

RESUMEN

Palabras clave

Metaanálisis;
ciudadanía digital;
sociedad digital; TIC;
líneas de investigación

En este trabajo se llevó a cabo un metaanálisis en el que se compilaron investigaciones sobre la ciudadanía digital realizadas en México de 2011 a 2023. El objetivo fue argumentar, analizar y categorizar las líneas de generación y aplicación del conocimiento (LGAC) relacionadas con la ciudadanía digital en el país. La metodología que se aplicó fue el metaanálisis, con el cual se documentaron 88 investigaciones: 47 ponencias, 33 artículos de revista y ocho tesis de grado. Los estudios encontrados apoyan la existencia de seis LGAC en México. Se concluyó que los estudios se relacionan en comprender la forma en que la sociedad se apropia de las tecnologías digitales, las interacciones mediante las redes sociales y las manifestaciones de la identidad digital. Otro aspecto destacado es que el estudio de la ciudadanía digital se ha empleado para analizar la adquisición de habilidades y actitudes digitales, las problemáticas sociales que aborda la digitalización, los roles que desempeñan los actores educativos en el entorno virtual y la promoción de la multiculturalidad. Los resultados hacen hincapié en la relevancia de las LGAC y permiten concluir que la ciudadanía digital es una temática actual en las investigaciones sobre tecnología educativa en México.

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INTRODUCTION

There is no doubt that today society is immersed in the use of electronic devices and the internet, and that there is a close relationship between social advancement and technological progress. Digital resources are complements that facilitate the life of the 21st century citizen, while representing the main means of interacting with other people; at the level of integration, they have an impact on labor, communication and educational aspects (Pérez *et al.*, 2018).

In Mexico, since the health confinement due to the covid-19 pandemic, the Mexican internet Association (2022) identified that the last five years have seen the greatest growth in internet users, to such an extent that 75.6 % of the Mexican population over six years old surfs the Internet. In addition, an annual growth of 6.7% in the population that uses the internet is forecast for the coming years.

Given the continuous growth of internet users, coupled with the trend of virtualization of work and education, introduces the concept of *digital citizenship*. A digital citizen is distinguished by active, conscious and responsible participation in cyberspace (Choi *et al.*, 2017; Kim & Choi, 2018; Torrent and Martínez, 2017); and is characterized by mastery over the use of digital technologies, the use of netiquette, awareness of their actions on the network and online participation (Kim & Choi, 2018; Choi *et al.*, 2017; Lozano and Fernández, 2018). The literature states that conceptualizations of digital citizenship are usually associated with three factors: cognitive, emotional and behavioral (Kim & Choi, 2018).

The conceptions referring to the characterization of a digital citizen are frequently attached to aspects of the behavior of the human being in society, and from various positions it can be understood that the concept is nothing more than the expression of the digitalization of the activities of everyday life (López *et al.*, 2021).

Currently, digital technologies are increasingly within the reach of the common citizen and are significant elements in aspects of coverage and reductions in the digital divide; nevertheless, the skills necessary to exercise digital citizenship are some of the most important elements to strengthen the creation of a more inclusive digital society. In this sense, it is relevant to clarify that it is not only about what a digital citizen does, but that the ways in which they socialize, make decisions, exercise their opinions and create collaboration networks must also be taken into account (Kim & Choi, 2018 Choi *et al.*, 2017).

The training of future digital citizens is based on the development of skills, abilities and skills related to the use and interaction in digital media. This begins with technical skills: the knowledge and skills necessary to access information, use it to your advantage and implement critical thinking to

mediate with content on the network. The latter refers to reflecting on how appropriate the content you share is. The above also includes skill in managing digital devices and internet networks, as well as managing accounts and profiles (Choi *et al.*, 2017).

Social interactions on the network require communication skills and digital ethics, in addition to the recognition of the rights and responsibilities acquired as users (Torrent and Martínez, 2017). In other words, the thinking skills exercised by digital citizens imply mastery over the rest of the skills in digital citizenship. This is because to exercise them it is necessary to know technical strategies and have notions about ethical behavior on social networks. The skills that must be used when exercising judgment for decision making and problem solving are critical thinking and communication skills (Choi *et al.*, 2017).

Currently, some international associations have reiterated the importance of training digital citizens to develop a virtual society. In this sense, iKeepSafe (2021) maintains that the creation of citizens should be based on practice using digital technologies ethically, while the European Digital Competence Framework for Citizenship postulates the development of competencies in the use, communication and troubleshooting (Carretero *et al.*, 2017). Finally, the International Society for Technology in Education (ISTE, 2016) refers to the creation of digital citizens from the development of skills to search for information and encourage reflection, respect and empathy in internet users. Under this order of ideas, it is established that the purpose of digital citizenship is to form conscious people, emphasize education, empowerment, protection and access to information and communication technologies (Zamora, 2020).

In the context of current society, the importance of integrating aspects of digital citizenship related to the education of young Mexicans is central, as they constitute most internet users in the country (Mexican Internet Association, 2022). The constant updating and communication in digitalized contexts has led to the need to educate people as digital citizens, that is, who have the ability to participate in the digital society in a safe, ethical and effective way. Digital citizenship education teaches users how to protect their personal information, recognize and avoid online fraud, and protect themselves from the risks associated with harassment and bullying and *cyberbullying* (Choi *et al.*, 2017; Kim and Choi, 2018), guaranteeing safety for users.

Providing education about the interactions that digital spaces entail in the daily lives of digital citizens necessitates helping to reduce the number of people who are victims of virtual crimes (López *et al.*, 2021). Technology users often face situations online that can put their privacy or those of others at risk. Through the understanding of digital citizenship, users can better understand the ethical implications of their actions on the internet (Núñez and Gradilla, 2021).

Under the same tenor, digital citizenship education is positioned as a relevant need for the development of citizens in the 21st century, and its importance is highlighted under the assumption that it allows users to participate effectively in the digital society (Domínguez and López, 2019). As technology continues to evolve, it is essential that users acquire the skills and knowledge to participate in making decisions that affect online society. Digital citizenship education teaches users how to search and evaluate online information, how to participate in online dialogue, and how to use digital tools to achieve their personal and professional goals (Soto, 2019).

Likewise, digital citizenship education is essential in today's society to ensure online safety, encourage ethical and responsible behavior, and enable effective participation. It is then that educators, parents and carers must ensure that young people have access to digital citizenship education, as it will not only provide them with practical knowledge and skills but will also help them develop the values necessary to maintain a digital society that is healthy and sustainable in the future (Huerta *et al.*, 2021).

Given the prevailing need to continue documenting and contributing to the training of digital citizens, this study reviews various documents on digital citizenship in Mexico, allowing us to discover the relevance of the phenomenon in the Mexican context and establish the lines of “generation and application of knowledge” (known in Spanish as LGAC) on which work has been done, in addition to postulating emerging lines of research.

Therefore, this study highlighted the importance of arguing, analyzing and categorizing the LGACs related to digital citizenship in Mexico. The central question of this research was: what are the LGACs that reflect the studies on digital citizenship in Mexico?

METHODOLOGY

Meta-analysis was used as a methodological basis. This approach is a quantitative synthesis, whose compilation of primary studies allows the recovery of evidence that, when combined, contributes to the holistic understanding of a variable (Borenstein *et al.*, 2009). On the other hand, it is an efficient methodology to synthesize evidence on a specific topic or variable, which allows establishing concrete conclusions about its status in science (Hedges & Olkin, 1985). The selection of the method was attributed to the fact that, through statistical analysis, global findings were integrated that evidenced the presence of digital citizenship in Mexican educational research, as well as its contribution to the development of LGAC on the topic (Chalmers *et al.*, 2002; Glass, 1976).

The research was carried out by adapting the work of Olivares *et al.* (2016), and the phases mentioned by Londoño *et al.* (2016) were followed. The first phase is called heuristics and is used in the context of meta-analysis to establish search strategies and information selection criteria. Furthermore, it is characterized by describing the way in which the unit of analysis is accessed (Higgins *et al.*, 2023). In the case of this research, the unit of analysis refers to the studies generated in relation to the topic of digital citizenship in Mexico. The sources supported by the study are magazine articles, presentations at national conferences and degree theses (bachelor's, master's and doctoral degrees).

The information inclusion criteria were those used by Olivares *et al.* (2016): 1) that the studies were written in Spanish or English, 2) that the sources were reliable and recognized nationally and internationally, 3) that they belonged to indexed journals, 4) that the accepted research was empirical, theoretical and under review and 5) that the research has been published in the period 2011-2023. Regarding the databases studied, the repositories of Mexican educational research journals, proceedings of conferences held in Mexico and degree theses from Mexican universities were considered (see table 1).

Table 1. Information repositories

TIPO DE DOCUMENTO	REPOSITORIO	DIRECCIÓN ELECTRÓNICA
Artículos de revista	<i>Revista Mexicana de Investigación Educativa</i>	http://www.comie.org.mx/v1/revista
	<i>Revista Apertura</i> (Universidad de Guadalajara)	http://www.udgvirtual.udg.mx/apertura/index.php/apertura/issue/archive
	<i>Revista Iberoamericana para la Investigación y el Desarrollo Educativo</i> <i>Revista Iberoamericana de Tecnologías del Aprendizaje</i>	http://www.ride.org.mx/index.php/RIDE https://dialnet.unirioja.es/servlet/revista?codigo=26560
	<i>Revista Electrónica de Tecnología Educativa</i>	https://www.edutec.es/revista/index.php/edutec-e
Ponencias de congreso	Congreso Mexicano	https://www.comie.org.mx
Tesis de posgrado	Repositorio de tesis de la Universidad Nacional Autónoma de México (UNAM)	https://tesiunam.dgb.unam.mx/F?func=find-b-0&local_base=TES01

In the second phase of the study, the proposal of Londoño *et al.* (2016) on hermeneutics was taken up again, which gives meaning to the information collected, while implying the interpretation and understanding of the characteristics of the studies analyzed; through a process of analysis and comparison, the variations in the specific methodological contents of each investigation are established, formulating similarities, differences, criticisms, gaps and conclusions (Fau and Nabzo, 2020). In this case, we sought to analyze the studies on digital citizenship in Mexico through the amount of existing research, as well as interpret the information presented.

The reviewed papers were organized by LGAC. To establish control over the research areas, the LGACs of the Universidad Veracruzana, the Technological Institute of Sonora, the Autonomous University of Querétaro, the Autonomous University of the State of Morelos and the Tecnológico de Monterrey were taken into account. Likewise, six LGACs were identified: 1) Digital resources and media for education, 2) Policies, foresight and quality in educational systems and environments, 3) Education for democracy and citizenship training, 4) Cultural studies in the era of convergence, 5) Ethics, politics and diversity in organizations, educational processes and actors, and 6) Sociocultural contexts of the use of digital technology.

After establishing the LGACs, the information collection stage began, for which the following were consulted: *Mexican Journal of Educational Research*, from volume XVI (2011) to XXIV (2019), 25 issues of the magazine *Opening* (2011-2023), nine issues of the *Ibero-American Magazine of Learning Technologies* (2011-2022) and 48 issues of the *Electronic Magazine of Educational Technology* (2011-2023). Regarding the presentations, the electronic memories of the National Educational Research Congress were reviewed by the Mexican Council for Educational Research (COMIE), in its editions XI (2011) to XV (2020).

For the compilation of the degree theses, the institutional repository of the National Autonomous University of Mexico was considered, and the search was guided by the following keywords: digital citizenship, *digital citizenship*, digital ethics, digital commitment, digital etiquette, digital culture, digital environment and digital behavior.

RESULTS

88 investigations were obtained corresponding to the period 2011-2023 (47 papers, 33 magazine articles and eight-degree theses). A notable aspect was the population which the investigations studied, as there was greater interest in analyzing digital citizenship at the university student level. Of the 88 total, 35 studies investigated this population (see table 2).

Table 2. Population targeted by the studies

Population	Amount	Percentage
University students	35	39.77
Youths	13	14.77
Teachers	14	15.91

Primary	6	6.82
not specified	6	6.82
Adults	4	4.55
Baccalaureate	3	3.41
Documentary	3	3.41
Teenagers	2	2.27
Women	1	1.14
Preschool	1	1.14

The studies found support the six LGACs on digital citizenship in Mexico. Among the lines found, Cultural Studies in the era of convergence stands out, because 33 investigations adhere to this theme; followed by Digital resources and media for education, with 28 research papers around this topic (see table 3).

Table 3. Relationship between LGAC and number of studies

LGAC	Amount	Percentage
Cultural studies in the era of convergence	33	37.5
Digital resources and media for education	28	31.82
Sociocultural contexts of the use of digital technology	10	11.36
Political ethics and diversity in educational organizations, processes and actors	9	10.23
Education for democracy and citizenship training	5	5.68
Policies, foresight and quality in educational systems and environments	3	3.41

The LGACs are aimed at social, cultural, educational, democratic, political and training studies on digital technologies. In the first LGAC there are studies on the social uses of digital technologies (Domínguez and López, 2019; García, 2021; Soberano *et al.*, 2021), the appropriation and uses of technologies (Bolívar and Jiménez, 2019; Campa Rubio *et al.*, 2021; Lion *et al.*, 2022; Lopez *et al.*, 2021; Veytia & Artavia, 2023;

Zempoalteca *et al.*, 2023) and digital identity (Huerta *et al.*, 2021; Meza *et al.*, 2019; Rendon *et al.*, 2023).

The second LGAC was on digital literacy (Barbudo, 2021; Canchola, 2019; De la Rosa, 2021), digital divide (Chino *et al.*, 2021; Domínguez and López, 2019; Marquez *et al.*, 2021; Mortis *et al.*, 2022), digital literacy (Aguilar, 2019; Cervantes, 2019; Hernández, 2021; Zorrilla y Castillo, 2023) and, as an emerging line, technological empowerment of minorities (Cab Pech *et al.*, 2021; Rendón and Angulo, 2022).

The third LGAC focused its studies on digital society, digital culture and virtual communities (Bolívar and Jiménez, 2019; Huerta *et al.*, 2021; Lopez *et al.*, 2021). The fourth LGAC highlights the analysis of ethics on the network and educational actors in digital citizenship (Cerón, 2019; Miranda *et al.*, 2019; Núñez and Gradilla, 2021; Rocha *et al.*, 2021). The fifth LGAC evidenced research work on the ways in which school plans and programs generate citizens (Soto, 2019, 2020), while the sixth LGAC made reference to studies on legal and regulatory frameworks, standards, dimensions and quality indicators. and social impact, organizational management models, internationalization and multiculturalism (Guadamillas, 2017; Huerta, 2018).

Among the findings evidenced by the distribution of studies (annual increase), it is observed that the year with the highest academic productivity on the topic was 2019, with a total of 20 articles, followed by 2021, with 15 articles. It was found that the research trend on LGACs was the following: Digital resources and media for education has a greater presence of articles in 2019, and it is an LGAC that has at least one product in each year of the period 2013-2023; a similar case was that of Cultural studies in the era of convergence, which showed the greatest number of works in 2015 and 2017, and was present in all years of the period 2015-2021.

Regarding the sociocultural contexts of the use of digital technology, studies were found in the period 2015-2021, with a greater presence in the years 2015 and 2017; while on Education for democracy and citizenship training, a greater number of studies were observed in 2018. A particular case was that of Policies, foresight and quality in educational systems and environments, since this has a constant presence between the years 2016 and 2018, with the same number of jobs per year.

Regarding the purpose of the studies analyzed, the magnitude of investigative work in the area of technological and cultural appropriation of citizens (23) became evident, followed by the topic of communication in digital media (17), the studies of technological literacy (11), the digital divide (9), the exploration of behaviors (7), the development of digital skills (5), the definition of interactions on the network (4), digital communities (3) and digital literacy (2).

DISCUSSION

The findings regarding technological and cultural appropriation postulate that adaptation techniques promoted by the health contingency have been disseminated, which is why everyday aspects have been digitalized. In this sense, the appropriation of technology has been carried out through refresher courses, video tutorials and the use of user manuals (Barbudo *et al.*, 2021); however, one of the elements that has stood out the most is the increase in culture and notions of a digital society. Looking at the sociocultural aspects, there has been the development of awareness campaigns about the ethical and moral aspects that users must exercise on social networks, as well as the assimilation of rights on the internet. At the same time, there has been an increase in the use of different social networks to generate virtual communities, whether for work or leisure reasons (Huerta *et al.*, 2021).

From an educational standpoint, the strengthening of digital citizens has benefited from the development of techno-pedagogical strategies, which allow digital content and tools to be mediated, either through learning modalities (such as the flipped classroom) or through the management of asynchronous platforms (Lopez *et al.*, 2021). These academic contributions theoretically agree with the priority areas for the establishment of virtual communities expressed by Rheingold (1994), who raises the relevance of the construction of digital citizens who respond to the problems of the virtual society in an active, inclusive way. However, educational results are lacking in terms of available digital citizenship studies.

The results obtained from the research carried out in Mexico reveal that there are problems related to elements of digital citizenship and education. In this sense, we can observe that the plans and programs in compulsory education show gaps in the integration of new information, communication, knowledge and digital learning technologies in education (ICTCAD) (Domínguez and López, 2019; García, 2021).

Regarding the contrast with other meta-analyses developed in Mexico, the evidence collected reveals areas of opportunity that have been present since 2016. The results of Olivares *et al.* (2016) point out that older adults represent a population at risk of being left behind in the virtual setting. These findings are supported by Ibarra *et al.* (2017), who agree by highlighting that the university population has been studied the most.

The differences in the studies between the various populations are evident and are attributed to the first dimension of the digital divide expressed by Van Dijk (2017). This dimension indicates the distance in access between populations that do not have the same opportunities to have technological resources in the fulfillment of educational work or in their daily lives,

which demonstrates that access problems contribute to the underdevelopment of vulnerable populations.

In other observed results, Campa Rubio *et al.*, (2021) add that the gap in the use of ICTCAD by teachers is due to the lack of training and curricular flexibility, in addition to the little or no application of digital tools in the classroom. In the case of upper secondary education teachers, they only receive training once a year in techno-pedagogical practices. Regarding the analysis of the educational platforms used by higher education institutions, they are classified as insecure, due to the absence of elements that protect the privacy of users or adequate training (De la Rosa, 2021).

Based on the evidence of the profiles of netizens in Mexico, the empirical results demonstrate the existence of a digital divide due to age (Chino *et al.*, 2021), since it is common to find in the results that with older age, usage of digital technologies is diminished. Canchola (2019) points out that the self-perception of technological mastery in older adults is lower than that of young people, however, he points out that the reduction of the digital divide in this group can be achieved through the interaction that individuals have with others close to them, such as through the support of their families. Likewise, they are presented with the benefits of connectivity offered by social networks to improve their emotional state, discovering more about technology and, with this, changing their self-perception in the domain of digital skills (Huerta *et al.*, 2021; Meza *et al.*, 2019).

The findings in relation to digital competence on digital citizenship in young Mexicans are mixed. Exploring the empirical evidence, studies demonstrate that young people have high mastery over the technical skills involved in the use of digital technologies, while showing low mastery over ethical and communicative aspects (Hernández, 2021); furthermore, they highlight the lack of an instrument to evaluate online ethical actions in the Mexican context.

CONCLUSION

Based on the objective and the discussion of the results of this meta-analysis, the following conclusions were obtained: 1) the literature investigates the way in which society appropriates digital technologies, and 2) it strives to understand the interactions on social networks and expressions of digital identity.

Other points to highlight are that the study of digital citizenship has been used to analyze the acquisition of digital skills and attitudes, the social problems that digitalization addresses, the roles played by educational actors in the virtual environment and the promotion of multiculturalism.

At the same time, as emerging areas of research, it is proposed to develop programs to promote healthy interaction on social networks, as well as plans that encourage the creation of digital citizens suitable for school and work mediated by digital technologies.

In the results obtained, a greater presence of studies aimed at university students and young people was observed, which is why preschool students, adolescents and high school students are postulated as an emerging population. In this same order of ideas, the need to extend the topic of digital citizenship to all population sectors is evident, for example, research on older adults, minorities and vulnerable sectors.

One of the elements that stands out in the analysis is the variability evidenced by academic production on the topic of digital citizenship, since the progress from the period from 2013 (with seven studies) to 2019 (with 20 studies) is evident. Although only 15 studies were found in 2021, researchers infer an increase in research in the coming years due to technological immersion derived from the conditions caused by covid-19.

One of the main observations raised is to promote the use of sociodemographic variables in research and analyze their relationship with the variables that represent digital citizenship, with the intention of classifying the populations under study in the future, contributing to the construction of a more specific framework of reference that considers some characteristics such as the use of digital technologies, hours dedicated to internet use, age, and gender.

Important debates emerge from the conclusions of the analyzed research for the study of digital citizenship in the Mexican population. The contributions of various authors who support the idea of achieving competent digital citizenship in Mexico through the promotion of digital skills and competencies in the population are rescued, where the initial action is to promote digital literacy from an early age through the teaching of technical skills, such as the use of digital tools and devices, and critical skills to analyze and understand information found on the network.

Furthermore, they find it relevant to promote education in ethical and citizen values in the digital environment along with practical content on the use of technology, which implies the development of a culture of responsibility, respect and tolerance in the use of networks. social networks and digital platforms, as well as awareness of the risks that exist on the internet and the importance of protecting privacy and personal information. To guarantee a more inclusive digital citizenship in Mexico, it is necessary to implement public policies that facilitate access to technology and the internet in all regions of the country. This involves investing in telecommunications infrastructure and promoting digital inclusion programs so that the population has access to quality devices and connectivity.

In the conclusions of various analyzed works, emphasis is placed on the relevance of the role of educational institutions, which directly impacts the training of digital citizens, and the teaching of digital and ethical skills is established as fundamental at all educational levels. It is necessary that educational programs include comprehensive training that allows students to acquire the technical, critical and ethical skills necessary to interact effectively and responsibly in the digital environment.

It is relevant to highlight that the formation of competent digital citizenship in Mexico requires the active participation of all social actors, which includes the government, educational institutions, companies, civil organizations and society in general. Only through a joint and coordinated effort can we guarantee competent digital citizenship that is prepared to face the challenges of the digital world.

The studies found provide relevance to the LGAC and allow us to conclude that digital citizenship is a topic present in research on educational technology in Mexico. The researchers urge more work to be carried out in the area, in order to establish a broader framework for future research and generate studies on the characteristics of the Mexican digital citizen.

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