



What Got Us Here, Won't Get Us There

15th International Conference of the European Academy of Design
ONLINE and in PERSON in Brazil, Finland, India, Spain and the UK.
16-20 October 2023

Postgraduate Programmes Evolution in Mexico: Perspectives from three regions

David Sánchez Ruano^{a*}, Silvia Verónica Ariza Ampudia^b, Brenda García Parra^c, Christian Chávez López^d, Alejandro Briseño Vilches^e

^aTecnológico de Monterrey, Escuela de Arquitectura, Arte y Diseño

^bUniversidad Autónoma de Ciudad Juárez, Instituto de Arquitectura, Diseño y Arte

^cUniversidad Nacional Autónoma de México

^dUniversidad Autónoma Metropolitana

^eUniversidad de Guadalajara

*Corresponding author e-mail: david.sanchezr@tec.mx

Abstract: Design education and research in Mexico have been advancing and adapting. The European influence in the development of its teaching was particularly evident through the creation of art academies and contact with pioneering institutions that led to the regional development of graduate programs. The importance of the link between design education and professional practice to create a solid academic base for the discipline is notorious depending on the region. In Mexico, progress has been made in research policies, as evidenced by the growth in the number of postgraduate programs in design, however, the slow development of doctoral programs and the dependence on national priorities and assigned limited government budgets is evident. Doctoral programs emphasise theoretical and scientific rigour to promote knowledge production, but there is a deficiency of practical verification in communities and innovation centres. Design education in Mexico aims to achieve a new higher quality profile and international recognition.

Keywords: postgraduate studies, Mexico, regional, development, design

1. Mexican Design Schools and the European Link

It was in the early fifties under the influence of The New Bauhaus in Chicago and also with migrant students and teachers of the Hochschule für Gestaltung in Ulm, that the creation of design schools in Latin America began (Bonsiepe & Cullars, 1991). Such is the case of Tomás Maldonado who visited Ulm and his contact with Gui Bonsiepe (Devalle, 2018) established as professor in Germany, United States and later on in Argentina. Another case is Cuban-Mexican designer Clara Porset who collaborated with Josef Albers from the Bauhaus (Mallet, 2013) influenced the creation of teaching courses in the Universidad Nacional Autónoma de México.

One of the first schools to implement a study program in design was Universidad Iberoamericana, which was inspired by the festivities of the 1968 Olympic Games, the industrial growth of the country

and the development of art and culture. The first course in graphic design at Iberoamericana was followed by the National School of Architecture with Professor Horacio Duran who founded the Industrial Design program (Encuadre, 2006). The influence of German, British and Italian design during the last three decades of the twentieth century determined that the industry and the academy recognized design as a discipline that would go beyond art.

At the same time, the identity that Mexico embodies from pre-Columbian cultures to the present day has remained within the limits of crafts and small and medium-scale production. According to the design historian Dina Comisarenko (Gravier et al., 2020), Mexican design culture reconstruction is still being sought, highlighting the individual and social change. With this preamble, it is possible to identify not only the historical pattern of design education in Mexico, but in all of Latin America, emphasizing the European influence for its construction.

2. Regional Development of Postgraduate Programmes

2.1 The case of Central Mexico as seed capital

According to the geographic characteristics of INEGI Mexico (2018), the central region of the country is made up of Mexico City, Guerrero, Hidalgo, State of Mexico, Morelos, Puebla, Tlaxcala, and Oaxaca, where an important nucleus of industrial and commercial entities, educational and governmental institutions, healthcare services, among others, is concentrated. This concentration is further intensified in Mexico City and the State of Mexico, generating a first effect of centralization and saturation that spreads to nearby states and the rest of the country.

The first graduate programs in Mexico began in Mexico City around the 1920s (García, J. 1990). However, it was not until 1946 that graduate studies acquired their current structure, separated from undergraduate programs, and exponential growth in the offering of graduate programs was observed in the 1970s, both in the public and private sectors. At UNAM, doctoral and master's degrees were awarded continuously starting in 1932, and the first Higher Education Studies Regulations were issued in 1967, establishing criteria for graduate programs, making UNAM's work a pioneer in Latin America (UNAM Graduate Studies, n.d.).

In the case of Design, the start of graduate programs in Design in Mexico City can be linked to the emergence and promotion of architecture and urbanism programs, followed by Industrial Design programs in 1981. "...Graduate courses in Industrial Design [at UNAM], the first in Latin America, began, coordinated by Fernando Martín Juez"; others, such as the Master's in Creativity, previously the Master's in Design, Creativity, and Communication at the National School of Fine Arts Institute (EDINBA), are also pioneers in Design education at the graduate level (Ariza, 2012). However, it should be noted that depending on different approaches, disciplinary areas, or even trends, programs that consider Design can be found in faculties or schools belonging to areas related to engineering, marketing, or even administration.

According to Berlanga (2022), the reference criteria for graduate programs (such as classification or ranking systems) go beyond the volume of academic production or number of published articles and also consider qualitative aspects, as well as learning and research outcomes and performance according to their field of study. Thus, in this article, some of the programs that have a significant historical trajectory within the Design academic community or have been registered in the National Program of Quality Graduate Programs (PNPC) are presented below.

As shown in Table 1, graduate programs offered in the central zone of Mexico by the National Autonomous University of Mexico (UNAM) and the Metropolitan Autonomous University (UAM) have stood out for the type and number of Design graduate programs offered, characterised by the variety of approaches and disciplinary, inter and transdisciplinary scopes, from the different schools, faculties, and research centres that have been part of these two institutions.

As a background, graduate programs in Design at both institutions, although from different perspectives, share the common characteristic of having ventured and laid the first educational foundations at the graduate level, and whose initial proposals highlight the deep consideration of the social, political, cultural, and economic context of the central zone of the country, being a seedbed for the rest of the country, sharing a faculty with great trajectory with EDINBA, UAEM, and the Iberoamerican University.

The Faculty of Arts and Design at the National Autonomous University of Mexico (UNAM) in 1971 allowed the Master's in Visual Arts to include a focus on Design and Visual Communication, which later became an autonomous field of knowledge. In 2011, the Postgraduate Program in Arts and Design was created, which includes the Master's in Design and Visual Communication, the Master's in Teaching in Arts and Design, the Master's in Documentary Film, and the Doctorate in Arts and Design (P.P. Tomo I, p.2). The latter aims to revalue the activity of visual artists, designers, visual communicators, art and design teachers, and documentary filmmakers, maintaining a balance between arts, humanities, and sciences to confront their research-production work.

Table 1. Comparison table of postgraduate programmes offered in central Mexico region.

Central Region State	Institution	Programme Offered	Perspective	Opening year
Mexico City	Universidad Nacional Autónoma de México (UNAM)	Master's Degree in Visual Arts	Focus visual arts from a theoretical-practical approach	Approved in 1969
		Master's Degree in Design and Visual Communication	Methodological perspectives from an inter-trans-multidisciplinary approach	Approved in 2008
		Master's Degree in Teaching in Arts and Design	Train teachers and professionals in visual arts and design from a multidisciplinary approach	Approved in 2008
		Master's Degree in Documentary Filmmaking	Research, management and documentary production	Approved in 2008
		PhD in Arts and Design	Train researchers, producers and teachers with an inter-trans-multidisciplinary approach	Approved in 2008

Mexico City	Universidad Nacional Autónoma de México (UNAM)	Master's Degree and PhD in Architecture	Critical, social and environmental approach	Approved in 1968 and restructured in 1996 by the Graduate Studies Division of the School of Architecture.
		Master's Degree and PhD in Urban Planning	Interventions in urban phenomena from a multidisciplinary, critical and social approach	Approved in 1967 and restructured in 2000 by the General Coordination of Graduate Studies
		Master's Degree in Industrial Design	Quality research for project activity and design development	Approved in 1980
Mexico City	Universidad Autónoma Metropolitana - Xochimilco Campus	Master's Degree in Sciences and Arts of Design	Interdisciplinary	Approved in 1995, adequate to start in 1997
		PhD in Sciences and Arts of Design	Interdisciplinary	Approved in 2003
		Master's Degree in Design and Editorial Production	Transdisciplinary	Approved in 2009
	Universidad Autónoma Metropolitana - Azcapotzalco Campus	Master's Degree in Design and Product Development	Disciplinary e Interdisciplinary	Approved in 1981
		Master's Degree in Bioclimatic Design	Interdisciplinary	Approved in 2015
		Master's Degree in Design and visual information	Interdisciplinary	Approved in 2015
	Universidad Autónoma Metropolitana - Cuajimalpa Campus	Master in Design, information and communication	Interdisciplinary and Transdisciplinary	Approved in 2012 with modification in 2018
Mexico City	Escuela de Diseño del Instituto Nacional de Bellas Artes (EDINBA)	Master's Degree in Creativity for Design	Interdisciplinary	Approved in 1994
		Master's Degree in Theory and Critique of Design	Disciplinary and Interdisciplinary	No data

Mexico City	Universidad Iberoamericana	Master's Degree in Strategic Design and Innovation	Disciplinary and Interdisciplinary	Opening in 2006
Morelos	Universidad Autónoma del Estado de Morelos (UAEM)	Master's Degree and PhD in Image, Art, Culture and Society	Researchers in social and creative processes from an inter-trans-multidisciplinary approach	No data
State of Mexico	Universidad Autónoma del Estado de México (UAEM)	PhD in Design	Train researchers in transdisciplinary design	No data

The Autonomous Metropolitan University (UAM) offered its first Design postgraduate program in 1982 with the Master's in Product Development, in collaboration with Gui Bonsiepe from the HFG in Ulm, Germany (M. Rodríguez Viqueira, comunicación personal, Marzo 2023). Later, the specialisation in Environmental Design was created, which evolved into Master's and Doctorate programs with the inclusion of more development lines in the field of design. In subsequent years, various postgraduate Design programs were created in the different UAM units.

Master's programs in Design at both institutions offer planned and gradual guidance in the level of approach to the established lines or areas in the program, with the intention of enriching the documentary and research work for the development of a thesis. The projects developed in the respond to the complex context of the City and State of Mexico and the surrounding states, highlighting the interest in the use and optimization of regional natural and material resources, analysis of traditional or artisanal production practices, linkage with particular technologies or production processes, and a deep analysis of the user and their context. Most programs have a social-humanistic profile, both in production and in research, but this does not guarantee the intervention and insertion of graduates in public and private institutions, or in the business sector. Therefore, it is necessary to promote research networks with perspectives of cooperation with other disciplinary fields, based on lines of research and theoretical-conceptual epistemological reflection with emerging approaches and through research production.

2.2 Programmes in west Mexico: an strategic positioning

The central-western region of Mexico, composed of seven states - Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit - is considered by the National Association of Higher Education Universities of the country (ANUIES). This region includes various universities, such as the private Tecnológico de Monterrey with its campuses in León and Guadalajara. The institution initiated a graduate program in Innovation and Industrial Design in 2010, which is currently undergoing restructuring. The public University of San Luis Potosí used to offer a postgraduate program in Habitat Sciences, which is also currently being restructured. The university, however, currently has a specialty in Habitat Sciences with a focus on the development of new products and editorial design. Additionally, the public University Virtual del Estado de Guanajuato (UVEG) offers a Doctorate in Innovation, while the private Instituto Tecnológico de Estudios Superiores de Occidente (ITESO) focuses on collective learning, reflection, and societal transformation. ITESO has a Master's in Strategic Design and Social Innovation.

Table 2. Comparison table of postgraduate programmes offered in west Mexico region.

West region state	Institution	Programme offered	Perspective	Opening year
Jalisco	Universidad de Guadalajara	Master in design and industrial innovation	Disciplinary, multi and interdisciplinary	Approval in 2015, started in 2016
		Master in Ergonomics	Disciplinary, multi and interdisciplinary	2005
		Master in design information and communication	Disciplinary	2021
	Instituto Tecnológico de Estudios Superiores de Occidente (ITESO)	Master in Strategic Design and Social Innovation	Disciplinary, multi, inter and transdisciplinary	Approval in 2018 started in 2020
Guanajuato	Universidad Virtual del Estado de Guanajuato (UVEG)	PhD in Innovation	Disciplinary, multi and interdisciplinary	2020
San Luis Potosí	Universidad Autónoma de San Luis Potosí (UASLP)	Specialty in Habitat Sciences, orientation in the development of new products and editorial design	Disciplinary, multi and interdisciplinary	2016

The public University of Guadalajara, which is 229 years old, adopted a network organisation model in 1993, diversifying into various parts of Jalisco and integrating high school, undergraduate, and graduate programs. The university is composed of 15 university centers, one of which is the University Center of Art, Architecture, and Design, which focuses on design-related fields (CUAAD, s.f). The center offers three Master's programs, including Information and Digital Communication Design, Ergonomics, and Product Development. The Information and Digital Communication Design program, which began in 2020, focuses on investigating and generating knowledge that contributes to understanding the challenges posed by new communication paradigms, with an emphasis on information design and data visualisation. The Ergonomics program is a full-time graduate program with research emphasis, recognized by CONACYT, which began in 2005. The Product Development program, initiated in 1996, aimed to cover two needs in the region: continuing education for designers in the professional sector, and the requirement of teachers with a master's degree for design programs in the region. In 2016, the university initiated a Master's in Industrial Design and Innovation (MDII), also recognized by CONACYT, aimed at linking industry, social entrepreneurship, and problem-solving. Students are required to undertake an exchange program at a national or international graduate program and complete an industry or civic organisation placement. Jalisco has been instrumental in the educational development of the region and other states in central Mexico,

and the offer of online postgraduate programs related to design is on the rise. See table 2 for comparison.

2.3 Northern region: a global response

The northern region of Mexico, comprising nine states, is home to approximately 266 public universities and higher education centres, as well as 641 private institutions (ANUIES, 2022). However, the number of design postgraduate programs in this part of the country is still incipient, with only 19 programs currently available, despite some undergraduate degrees having been in existence for more than thirty years. This invites us to question what level of specialisation or professionalisation of knowledge our environment requires and why design has not been considered an important area for regional development.

The growth of postgraduate programs at the national level is related to the requirement for faculty qualification, disciplinary diversity, and occupational specialisation, as well as the idea of design as a professional activity. Of the 19 postgraduate programs identified in the northern part of the country, only eight are located in public institutions, while the rest are in private universities. There are a few specialties and doctorates, and the rest are master's degrees. They are taught at ten universities in only four states, all of which border the United States. See comparative table 3.

The UDEM offers the highest number of postgraduate design programs, followed by the UACJ with two master's degrees and one doctorate. At this institution, the first postgraduate programs were for architects, as this degree opened almost 50 years ago at this institution. The Master's in Holistic Design (2003) was then opened, which began accepting the first graduates in graphic, industrial, and interior design from various institutions in the state. Currently, the seven postgraduate programs of the Institute of Architecture, Design, and Art have international students, researchers, and collaborators, which has allowed for a fluid dialogue on the scope of design in terms of its impact on the environment and the creation of networks.

The Doctorate in Design deserves attention for its perspective based on the trends of similar programs worldwide and the experience that several teacher-researchers had studying postgraduate programs at European universities, especially Spanish and English. It considers research through practice as well as the already traditional perspective of humanities doctorates to "understand a problem [that requires] a comprehensive will, discursive elaboration [and is the] classic scheme of humanities subjects (traditional discursive argumentation) with purely reflexive and discursive works" (de La Iglesia in Ariza, p. 539).

Table 3. Comparison table of postgraduate programmes offered in north Mexico region.

North region state	Institution	Programme offered	Perspective	Opening year
Baja California	Centro de Estudios Universitarios Xochicalco	Maester in Multimedia Design	Development, administration and evaluation of multimedia projects	Official validity record of 2013
	Universidad de Tijuana, CUT	Master in Planing and Urban Design	Methods for developing policies and projects	Official validity record of 2013

	Universidad Autónoma de Baja California	Master in Architecture, Urbanism and Design	Technical-scientific qualification of teachers	It is proposed in 2018 as a MyDAUD program by the Faculties of Mexicali, Tijuana and Ensenada
		PhD in Architecture, Urbanism and Design	Training of researchers in the multidisciplinary habitat studies	
	University José Vasconcelos	Master in Advertising and Multimedia Design	Mastery of the instruments of theory, practice and technique	Official validity record of 2018
Chihuahua	Instituto Superior de Arquitectura y Diseño	Master in Advanced Architectonic Design Diseño Arquitectónico Avanzado	Multidisciplinary knowledge and skills to design the architectural project	Opening in 2005
		Master in Innovation and Design Management	Methodologies, theories and processes of strategic design	Opening in 2015
	Universidad Autónoma de Ciudad Juárez	Master in Creative Studies and Processes in Art and Design	Emphasis on research-creation, interdisciplinary vision	Opening in 2010
		Master in Design and Product Development	Product planning, research and project generation	Background: Master in Holistic Design (2003)
		PhD in Design	Interdisciplinary approaches	
	Nuevo León	Universidad de Monterrey (UDEM)	Master in Art and Design of Video Games	Opening in 2015
			Master in Graphic Design	Opening in 2018, to accommodate graduates of both master's degrees and from other states in the region
			Master in Design and Development of Containers and Packaging (online)	Official validity record of 2017

	Universidad Autónoma de Nuevo León	Master in Interior Design and Architectural Environments	Study of living space, projects	
		Master in Graphic Design Orientation in Creative Direction	Management of creative projects, processes and products	Official validity record of 2009
	Instituto Tecnológico y de Estudios Superiores de Monterrey	Master in Architecture and Urban Design	Technological, participatory and creative tools to formulate projects	
Tamaulipas	Universidad Autónoma de Tamaulipas	Master of Architecture with	Emphasis in Architectural Design and Architectural Rehabilitation	Official validity record of 2018

On the other hand, the Tecnológico de Monterrey, with eighty years of experience and constant change and innovation, is now considered one of the best private universities in Latin America. Through its 22 campuses, it has managed to consolidate its School of Architecture, Art, and Design (EAAD) by promoting postgraduate and continuing education programs. The EAAD's strategy has been to position itself in ten campuses in different regions of the country with four undergraduate degrees and two postgraduate programs. Currently, the ongoing Master's in Architecture and Urban Design has the highest number of students. The Master's in Innovation and Design has been constantly updated, emphasising topics such as strategic, systemic, and prospective design. One of the challenges faced in maintaining postgraduate programs aligned with budgets and directed towards indexed production that responds to keeping the school within global rankings. This has led to refocusing the postgraduate program beyond professionalisation and much more towards scientific research.

Although the northern region of the country was one of the last regions to incorporate postgraduate programs in design, the growth rate is significant. We are still in the stage of primarily forming academics, but with the vision of training new design researchers and consultants who can open up novel perspectives for the region while advancing towards the consolidation of programs and projects related to industry. The insertion of more and more researchers into the National System of Researchers and interdisciplinary work contribute to this.

3. Supporting Organisations, Industry and Collectives

Design culture in Mexico has been largely promoted by organisations involved in accrediting educational programs. These bodies, such as the Interinstitutional Committees for the Evaluation of Higher Education (CIEES) and the Council for the Accreditation of Higher Education, are responsible for regulating the quality of educational programs in Mexico. While their primary focus is on evaluating undergraduate programs, they have also helped to create a framework for design education in the country. These organisations are made up of evaluators who consider market demand, program innovation, and educational philosophy. They recognize that working on design policy, as well as positioning the profession in social, commercial, government, and industrial spaces, are tasks that fall under both the professional and educational fields.

There have been initiatives to create national design policies in Mexico, such as the 2008 John Heskets's proposal which was presented to the Economic Commission of the National Chamber of Deputies (Rodríguez, 2008). This proposal aimed to promote an innovative mindset among entrepreneurs and businesses in Mexico, and to integrate innovation and development processes through research and design. Although there is no evidence of this initiative being followed up on, universities and accreditation institutions are continuing to build mechanisms that demonstrate the role of design in addressing Mexico's priority issues.

In addition to these efforts, independent groups like Diseña México, the Certification Council for Innovation and Design, and professional associations like the Mexican Association of Graphic Designers (AMEDIGRAF) and the College of Industrial and Graphic Designers of Mexico (CODIGRAM) are also contributing to the promotion of design culture in Mexico. The College of Designers of Mexico (coldi.mx) is an officially recognized organisation that represents designers in Mexico and aims to support their development, well-being, performance, promotion, and professional development with a focus on inclusion, sustainability, and innovation. There are also design associations at the state level, such as the College of Architects of Ciudad Juarez and the College of Interior Designers of Ciudad Juarez in Chihuahua, and the Graphic Designers Association in Jalisco.

The link between design education and professional practice is essential to create a solid academic foundation for the discipline (Rivera, 2018). According to Morales-Holguín and Gonzalez-Bello (2020), the establishment of design methods focused on project development in a workshop format has enabled the discipline to consolidate itself. The exchange between industry and academia has played a vital role in producing design professionals, and research-creation is one of the processes currently being promoted by the government and educational institutions.

The first approaches to a particular way of conducting research in this area came from countries such as England or the United States and from the academic environment. Christopher Frayling (1993) was one of the first to propose that research in design and art can be done on them or through them. Later, Fatina Saikaly (2003) found that two fundamental perspectives in design postgraduate programs are practice-oriented research and practice-centred research guided mainly by a reflexive and interpretative approach to inquiry.

Several postgraduate programs in Mexico, both professional and research-oriented, have materialised these perspectives in the content structure. The General Law on Humanities, Sciences, Technologies, and Innovation (HCTI Law), presented in 2022 and promoted by the National Council of Science and Technology (Conacyt), aims to vindicate "the humanistic and dialogic nature of the country's scientific and technological policy, through proposals linked to these areas that strengthen communities, the development of capacities, and national sovereignty" (Conacyt Communications, 2023). This is a step towards understanding that design and art can and should enter the public debate, open the barriers to interdisciplinary work, generate networks, and go beyond the experience of object-oriented or artistic production. It is essential to acquire a critical attitude and a systemic-prospective vision in research within the country, based on the study of novel approaches and the integration of emerging inter- or transdisciplinary methodologies.

4. Research Policy controversy: Searching the New Profile

Current policies for supporting research are related to the priorities of the country, generally focused on Engineering and technological development. One of the successes is the coincidences that have been had in promoting schools of Arts, Literature, and Architecture, generally grouped in humanities.

Until 2022, the National Program of Quality Postgraduate Studies of the National Council of Science and Technology showed more than twenty postgraduate programs in design in its catalogue. If we compare this with the number of programs that were part of this list in 2010 -barely seven: three in consolidated level, two in development, and two in recent creation- it could be thought that there was considerable growth. However, it would also be necessary to review the number of programs currently offered in the country. According to a study carried out by Ariza (2012), the number of programs that were registered in the ANUIES catalogue a decade ago was 58.

Starting in 2022, with the renewal and change of the PNPC to the National Postgraduate System, the evaluation has been pending, giving an opportunity to register programs with a less complex mechanism derived from a national policy that seeks to promote scholarships for anyone who wants to study a postgraduate program in Mexico. It cannot be denied that this new way of evaluating the quality of postgraduate programs has to do with the invitation to austerity of the current government and the reduction of funds for research, including less operational expenses. Perhaps what is important to rescue is the proposal for a social retribution for those of us dedicated to research and a more palpable impact of academic projects and products on the reality of the country.

Aligning the objectives of postgraduate programs with national problems has also allowed for certain openness for design programs, since the possibilities for impact are broad if we understand the levels of professional, ethical, social, and cultural responsibility (Frascara, 2000) of our practice. It is in this context that master's and doctoral programs in design in our country are aligning with the perspectives of the entities that manage and validate research. But far from meaning a setback for the discipline, this gives it a fertile field for the search for meaning.

We visualize a new profile where we can implement mechanisms in which design research in postgraduate programs leaves the traditional approach, where problems are commonly established by academic interests or in a disciplinary way to launch design as a project. By searching for highly collaborative research approaches, doctorates are governed by performance and incidence criteria that can generate regional projects and articulated macro-projects (CONACyT, 2021, p.9). We must take advantage of, as Findeli (2015) explains, that the reason why several possible research questions are hidden behind any design question is that its field of activity and its object of study is precisely the daily experience of people; therefore, the impact of the research must reach them. The contribution to social and economic development can only flourish in the commitment to more conscious links between the university and the local environment.

The development of doctoral programs has been slow, although in the last two decades, with the support of CONACyT, there has been an increase in the production of academic articles, the promotion of postgraduate scholarships, and the creation of research programs. There is no study that provides approximate information regarding the number of scientific products indexed in the country. One indicator could be the QR ranking by discipline, which in its latest edition only places UNAM and Tecnológico de Monterrey within the top 100 (Top Universities, n.d.). Currently, universities with more experience are beginning to take action to include these metrics in their statutes and strategic plans. A certain disadvantage appears on the map since most of the doctoral and master's programs promoted in the country depend on national priorities and the six-year budgets assigned to institutions.

In relation to the industrial and business sector, the postgraduate courses in design have made it possible to demonstrate the need and value of research for the improvement of productive and creative processes, as well as the intrinsic value of the systematic and systemic analysis of phenomena, context or users.

However, regarding the relationship between design postgraduate programs offer and its impacts in society, it can be noticed that the academic field is probably one of the most benefited areas, since the incorporation of graduate designers into academic programs has increased the educational quality and its level of specialisation. Likewise, the offer of Postgraduate Design programs has allowed a greater openness towards interdisciplinarity, through the participation of students from other disciplines, as well as the communication and dissemination of research projects with different actors, programs, researchers, institutions and companies, strengthening the creation of research lines in design.

5. Conclusion: Global Changes and the Future of the Country

Mexico and Latin America are striving for quality and global recognition in design education, with the aim of adapting to national recommendations for higher education. However, academic products generated from research do not often transcend in the form of patents or technological developments demanded by universities and society. Graduate programs offer opportunities for graduates in the business field, but deficiencies arise in terms of applying specialised knowledge to industry or innovation. Doctoral programs have a theoretical epistemic nature, which follows scientific rigour, generates new knowledge, and has an impact and development in academia. However, there is a lack of verification of practical knowledge in communities, laboratories, institutes, or innovation centres, and no controls to supervise their effectiveness or compliance in practice. Graduation competencies are ideal for strengthening and continuing research in the educational labour field.

Creative research offers a particular way of structuring discourse, developing broader perspectives on participation in the priority problems of the environment and society, and helps to systematically approach problems and collaborate with other areas of knowledge. The project-oriented perspective also opens up a world of opportunities. While Mexico has been following European models for design education, the dialogue has expanded, and researchers from different regions have come together to discuss how they have been adapting their specialties, master's, and doctoral programs to national recommendations.

The challenge may be less if we consider that the very nature of design is the adaptation of its search processes for solutions to the environment and users, we are experts in understanding where the problems are and how to address them. Our role as a knowledge area is to identify opportunities to improve situations, for which we have learned to observe the world, to work with communities. In Mexico, we are positive in thinking that the training of research designers can allow this vision to be broadened from the prevailing scientific and academic frameworks, it can achieve an opening in the field of discourse, reflection and design production to address the priority problems that research is due.

References

ANUIES. (2022). *Anuario Educación Superior 2021-2022. Asociación Nacional de Universidades e Instituciones de Educación Superior de México [Higher Education Yearbook 2021-2022. National Association of Universities and Institutions of Higher Education of Mexico]*. Retrieved February 27, 2023, from <http://www.anui.es.mx/informacion-y-servicios/informacion-estadistica-de-educacion-superior/anuario-estadistico-de-educacion-superior>

- Ariza, S. (2021). De la práctica a la investigación en el arte contemporáneo, producir conocimiento desde la creación [From practice to research in contemporary art, producing knowledge from creation]. *Arte, Individuo y Sociedad*, 33(2), 537–552. <https://doi.org/10.5209/aris.68916>
- Ariza, S. (2012). *La investigación en diseño: una visión desde los posgrados en México* [Research in design: a vision from postgraduate courses in Mexico]. Ciudad Juárez: Universidad Autónoma de Ciudad Juárez.
- Berlanga, V. (2020). Design of a Multidimensional Index of Classification of Rankings of Ibero-American Universities. *International Journal of Instruction*, 15(4), 17–34. <https://doi.org/10.29333/iji.2022.1542a>
- Bonsiepe, G., & Cullars, J. (1991). Designing the Future: Perspectives on Industrial and Graphic Design in Latin America. *Design Issues*, 7(2), 17–24. <https://doi.org/10.2307/1511403>
- COMAPROD, ENCUADRE, & DI-INTEGRA (Eds.). (2021). *Memorias sexto foro de diseño: la formación de los diseñadores y la relación con el ejercicio profesional* [Memories of the sixth design forum: the training of designers and the relationship with professional practice]. Guadalajara: Universidad de Guadalajara.
- CONACYT Consejo Nacional de Ciencia y Tecnología (2023). *Programa Nacional de Posgrados de Calidad, PNPC: ¿Qué es?* [National Quality Postgraduate Program, PNPC, what is it?], Gobierno de México. Retrieved February 27, 2023 from https://conacyt.mx/becas_posgrados/programa-nacional-de-posgrados-de-calidad/#:~:text=El%20Programa%20Nacional%20de%20Posgrados,Superior%20de%20la%20Secretar%C3%ADa%20de
- CONACYT Consejo Nacional de Ciencia y Tecnología. (2021). *Programa Nacional de Posgrados de Calidad: Términos de referencia para la evaluación y seguimiento de programas de nuevo ingreso* [National Quality Postgraduate Program: Terms of reference for the evaluation and follow-up of new entry programs]. Gobierno de México, Secretaría de Educación Pública, Subsecretaría de Educación Superior. https://conahcyt.mx/wp-content/uploads/convocatorias/PNPC/marcos_de_referencia/TerminosdeReferencia.pdf
- Coordinación General de Estudios de Posgrado. (n.d.). *Historia* [History], UNAM. Retrived February 17, 2023, from <https://www.posgrado.unam.mx/nosotros/historia/>
- Devalle, V. (2019). Tomás Maldonado, 1944–1957: From Arte Concreto to nueva visión. *Journal of Design History*, 32(1), 17–34. <https://doi.org/10.1093/jdh/epy039>
- Devalle, V., & Gravier, M. G. (Eds.). (2020). *Diseño latinoamericano: Diez miradas a una historia en construcción* [Latin American design: Ten looks at a history in the making]. Bogotá: Universidad de Bogotá Jorge Tadeo Lozano, Universidad Santo Tomás and Politécnico Granacolombiano.
- ENCUADRE Asociación Mexicana de Escuelas de Diseño Gráfico. (2006, October 6). *Algunos apuntes históricos sobre las escuelas de diseño* [Some historical notes on design schools]. Retrieved March 18, 2023 from <https://encuadre.org/algunos-apuntes-historicos-sobre-las-escuelas-de-diseno/>
- Facultad de Arquitectura. (n.d.). *Posgrados* [Postgraduate]. UNAM. Retrived March 21, 2023, from <https://arquitectura.unam.mx/posgrados.html>
- Findeli (2015). La recherche-projet en design et la question de la question de recherche: essai de clarification conceptuelle [Research-project in design and the question of the research question: attempt at conceptual clarification]. *Dans Sciences du Design*, 1(1), 45–57. <https://doi.org/10.3917/sdd.001.0045>
- Frascara, J. (2000). *Diseño gráfico para la gente* [Graphic design for people]. Buenos Aires: Ediciones Infinito.
- Frayling, C. (1993/4). Research in Art and Design. *Royal College of Art Research Papers*, 1(1), 1–5. https://researchonline.rca.ac.uk/384/3/frayling_research_in_art_and_design_1993.pdf
- García, J. (1990). El desarrollo del Posgrado en México: el caso de los sectores público y privado. *Revista Latinoamericana de Estudios Educativos* [Postgraduate development in Mexico: the case of the public and private sectors]. *Latin American Journal of Educational Studies*, 20(1), 107–130.

- INEGI Instituto Nacional de Estadística, Geografía e Informática. (2018, March 6). *Encuesta Nacional de Acceso a la Información Pública y Protección de Datos Personales 2016* [National Survey on Access to Public Information and Protection of Personal Data 2016], Gobierno de México. Retrieved February 20, 2023 from <https://www.inegi.org.mx/rnm/index.php/catalog/223/datafile/F25/V3358>
- Ivonne, O. L. B., Patricia, B. C., Alberta, E. I., Leticia, E. L., Antonio, P. E. J., De los Ángeles, L. C. M., Misael, Z. L., Eduardo, R. T., Nathanael, G. A. I., Carlos, H. B., & Nancy, G. M. (2010). *Evaluación y Acreditación de Programas Educativos por Organismos Externos* [Evaluation and Accreditation of Educational Programs by External Organizations]. Pachuca: Universidad Autónoma del Estado de Hidalgo. https://www.uaeh.edu.mx/adminyserv/dir_generales/evaluacion/pdf/EXTERNAS.pdf
- López, R., Casillas, M., & González, O. (2000). *Una historia de la UAM: Sus primeros 25 años* [A history of UAM: His first 25 years]. Ciudad de México: Universidad Autónoma Metropolitana.
- Maestría en Ergonomía. (n.d.). *Antecedentes Históricos* [Historical Background]. Centro Universitario de Arte, Arquitectura y Diseño, Universidad de Guadalajara. Retrieved April 6, 2023, from https://www.cuaad.udg.mx/?q=oferta/posgrados/maestrias/me/antecedentes_historicos
- Mallet, A. E. (2013). Clara Porset, diseño e identidad [Clara Porset, design and identity]. *Artelogie*, 5. <https://doi.org/10.4000/artelogie.5487>
- Posgrado en Diseño Industrial. (n.d.). *Maestría en Diseño Industrial* [Master in Industrial Design], UNAM. Retrieved March 21, 2023, from <https://posgrado.unam.mx/pdi/web/historia-pdi/>
- Programa de Posgrado en Artes y Diseño. (n.d.). *Historia* [History], UNAM. Retrieved February 18, 2023, from <https://posgrado.unam.mx/artesydiseno/paginas/2/historia>
- Programa de Posgrado en Urbanismo. (n.d.). *Antecedentes* [Background]. UNAM. Retrieved March 21, 2023, from <https://posgrado.unam.mx/urbanismo/InfoGeneralPosgrado.html>
- Rodríguez, J. (2010). Políticas nacionales de diseño: casos de éxito en diseño industrial en México [National design policies: success stories in industrial design in Mexico]. In *Memorias 2008: Congreso Nacional de Administración y Tecnología para la Arquitectura, Ingeniería y Diseño* (pp. 169–178). Ciudad de México: Universidad Autónoma Metropolitana.
- Saikaly, F. (2003). Design Re-thinking. Some issues about doctoral programmes in design. *Technè: Design Wisdom*, 5th European Academy of Design Conference, Barcelona.
- Secretaría de Educación Pública. (n.d.). *Reconocimientos de validez oficial de estudios del tipo superior* [Acknowledgments of official validity of higher type studies]. Retrieved March 3, 2023, from <https://sirvoes.sep.gob.mx/sirvoes/mvc/consultas>
- SEDATU Secretaría de Desarrollo Agrario Territorial y Urbano. (2018). *Programa Regional de Desarrollo del Norte* [Northern Regional Development Program]. Gobierno de México. https://www.senado.gob.mx/comisiones/desarrollo_regional/docs/ProgRegDesarr_Norte2014_2018.pdf
- Top Universities. (n.d.). *QS World University Rankings by Subject 2023: Art & Design*, QS Quacquarelli Symonds. Retrieved April 6, 2023, from <https://www.topuniversities.com/university-rankings/university-subject-rankings/2023/art-design>

About the Authors:

David Sanchez Ruano PhD in Design (University of Dundee), Master in Industrial Design (UNAM, Mexico), member of the National System of Researchers (CONAHCYT). Member of the International Network on Biomimicry. Leader of the Research Group: Advanced Design Processes for Sustainable Transformation.

Silvia Verónica Ariza Ampudia PhD in Design (UPV, Spain), Master's in Visual Arts (UNAM, Mexico), member of the National System of Researchers (CONAHCYT). Research focused on theory and teaching in design, he has published 5 books and more than 50 articles and chapters on these topics.

Brenda García Parra Master's Degree in Industrial Design (UNAM, Mexico). Co-coordinator of LeNS Mexico network and Lens Lab responsible at UAM Cuajimalpa. Research topics: Sustainable Product-Service System Design, LCA and Ecodesign. Author, co-author and editor of publications related to Design for Sustainability

Christian Chávez López PhD in Arts and Design (UNAM, Mexico). Specialist in Innovation in University Teaching and Complex Thinking. Member of the University Network for Sustainability (UNAM). Leader of the Research Group: Research, Complexity and Design. Co-author of publications related to Design and Education for Sustainability.

Briseño Vilches Alejandro Doctoral student in Educational Sciences from Santander University. Member of the Mexican Council for Accreditation of Design Programs in the Country. COMAPROD. Coordinator of the Master's Degree in Design and Industrial Innovation. He has co-authored several publications in design education.

Acknowledgements: We would like to thank our institutions who are seeking for a better academic offer in our regions and to CONHACYT who is adapting the needs of our future generations supporting public and private universities to develop quality research for education.