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An Exploration of the Landscape of Instructional Design: Understanding Changes and Pandemic Effects (2017-2022)

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The purpose of this study is to examine the scope of the field of instructional design and technology, along with the working area (desk) of the expert in this field, in the context of the effects of the pandemic. The study is a bibliographic mapping research. The data set includes bibliographic records of 2.397 scientific texts retrieved from the WOS Core Collection within the time range of 2017-2022 using search terms instructional design or instructional designer. Co-occurrence analyses encompassing author keywords were conducted on the data. As a result, maps and related outputs were obtained that reveal the concepts that the field focused on before and after the pandemic, as well as the relationships between these. Additionally, attempts were made to identify emerging concepts for both periods based on the outputs. According to the results, there has been a significant expansion in the concepts falling within the scope of instructional design and technology, and consequently in the roles and responsibilities of designers, in conjunction with the 2020s and the Covid-19 pandemic. Design concepts and variables, context, human factors, and research methodology are enriched within this expansion. This enrichment shifts the design process from a micro perspective focusing on learning environment and environmental variables to a macro perspective that emphasizes instructors, educational institutions, and culture. Within this perspective, while the weight of real instructional problems increases, the emphasis on theory, approach, and models significantly decreases.

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Introduction

Instructional design is a specialized field that is shaped by the definitions and boundaries of the larger educational landscape it operates within. To understand how the roles and responsibilities of instructional designers are shaped, it is important to examine how the field itself has evolved over time. When the phenomenon of educational technology emerged at the beginning of the twentieth century, it was far from today's understanding, and it only included the production and use of technologies of that time (photographs, slides, objects, museums, sound recordings, teaching machines) to assist learning and teaching. Early definitions of the educational technology field focused on instructional media—the showing (conveying) of knowledge to learners through concrete tools. In other words, in this early period, educational technology was viewed from the perspective of technologies integrated with learning and teaching processes (Andrews, 1904; Benjamin Jr., 1988; Emerly, 1925; Dorris, 1928; Reiser, 2018). However, with new ideas and developing technologies, the field changed continuously, and the goals of field experts played an important role in this change (Reiser, 2018).

During the period spanning from the 1920s to the late 1940s, advancements in media, such as voice recordings, radio broadcasting, and sound motion pictures, triggered a shift in the field of instructional design from visual-oriented teaching to the adoption of audio-visual instructional methods. This trend persisted until the mid-1950s when pioneers of the audio-visual teaching movement started exploring the potential contributions of communication theories to the utilization and design of instructional media (Shannon & Weaver, 1949). As the interest in the communication process increased, they began to perceive the phenomenon of educational technology as more than merely comprising audio-visual elements.

Although the educational technology field was regarded as being limited to use of audio-visual tools in education for half a century since its emergence, AECT (Association for Educational Communications and Technology) made the first official definition as audio-visual communications in 1963. This definition indicates that “Audiovisual communications is the branch of educational theory and practice concerned with the design and use of messages which control the learning process.” Although the 1963 definition is incomplete in many respects with today's perspective; it is significant because it replaces the concept of process with product, message and media with material and machine; and it contains some elements of learning and communication theories (Januszewski & Persichitte, 2008; Rieser & Dempsey 2012). In parallel with this change in the field's perspective, in the same period, James Finn introduced the concept of instructional technology to emphasize the cohesion of methods, tools and processes in the teaching process (Finn, 1963).

The first institution to determine the framework, scope and boundaries of the field, in other words where it starts and ends was AECT - Association for Educational Communications & Technology, which is a professional organization that advises instructional designers, educators and policy makers to enrich learning processes (AECT, 2019). Attaching great importance to the definition of the field, AECT established a definition and terminology committee within its own body and defined the field of education/instructional technology several times.

An analysis of the 1972 definition of AECT reveals the change in the nature of the field of instructional technology. The definition states that educational technology is a field involved in the facilitation of human learning through the systematic identification, development, organization and utilization of a full range of learning resources and through the management of these processes. This definition also showed that the field is not just about media. Thus, the field is focused on the design and use of messages that control the learning process rather than

media. The steps that the field expert should take in designing and using the messages—planning, production, selection, implementation, and management—are laid out in a systematic way. In addition, learning rather than teaching was emphasized (Januszewski & Persichitte, 2008).

With the advent of computers and computer-assisted instruction systems in the 1970s, AECT made the definition that the field would hold for the longest time in 1977.

> "Educational technology; is a complex and integrated process involving people, processes, ideas, tools and organizations in the analysis, planning, implementation, evaluation and management of problems for solving problems related to all aspects of human learning."

According to Reiser and Dempsey (2008), the 1977 definition was also ground-breaking in that it introduced terminologies (such as learning resources, learning problems and solutions) that would soon become widespread. Until the mid-1990s, both learning and teaching approaches and developments in information technologies had a significant impact on instructional technology. In the eighties and nineties, the behavioural learning movement left its place to cognitive and later constructivist learning approaches, and these theories had a great impact on instructional design practices. In addition, developments such as microcomputer, interactive video, CD-ROM and internet have increased the interest in online and distance education. Collaborative learning, which has gained popularity, has sprouted new teaching strategies (Reiser, 2018b; Roblyer & Doering, 2014; Driscoll, 2018).

As a result, the field of instructional technology was quite differentiated until the mid-1990s. AECT felt the need to bring a new definition to the concept of instructional technology and redefined it as the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning. Contrary to the previous two definitions, in the 1994 definition, the term instructional technology was used instead of educational technology, and theory and practice components from different fields such as psychology, project management and technology were brought together in addition to learning and teaching. Thus, it was revealed that instructional technologies are theories and practices related to the holistic design, development, use, management and evaluation of learning processes and resources (Seels & Richey, 1994).

According to the definition of AECT 1994; instruction is a tool to provide effective learning, while instructional technology is a method developed for the effective and efficient use of resources and processes used to design instruction. Therefore, it is both a theoretical and application area. There are five main steps in this method. In the design phase, message design, instructional strategy and learner characteristics are considered together, while the development phase focuses on the development of different types of instructional materials such as printed and audio-visual. Utilization focuses on the use of educational media, the realization of teaching, dissemination and institutionalization, and management on the instructional design project as well as the management of resources, information and distribution systems. Lastly, evaluation focuses on the effectiveness of both teaching and the instructional designer process, and in this context, it contains criteria-referenced, measurement, formative and summative evaluation components (AECT, 1994; Seels & Richey, 1994).

In 2008, AECT defined instructional technologies as the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources (Reiser, 2018a; Richey, 2008). The 2008 definition,

unlike previous definitions, is significant in that it addresses ethical practices and aims to facilitate learning and improve performance. However; the steps such as design, development and evaluation, which are a result of the tradition of instructional technology application and research that were conceptualized in the 1994 definition, were not included in this definition. The prominent issue in this definition was ethics. It can be explained as individuals and groups working in the field of ethics helping each other professionally, observing their intellectual rights and directing them at a higher level. The most up-to-date definition is the one on AECT's website, from 2017:

> "Educational technology is the study and ethical application of theory, research, and best practices to advance knowledge as well as mediate and improve learning and performance through the strategic design, management and implementation of learning and instructional processes and resources" (AECT, 2019).

Chronological examination of the definitions shows that they draw attention to two dimensions that have shaped the foundation of our field. These are the use of technology for instructional purposes and instructional design. The perspective, which initially focused on materials and media, has covered the whole teaching process and the elements of the learning process such as people, methods, technology, and ethics over the years. With this perspective, Reiser (2001) introduces the concept of Instructional Design and Technology and names the field as such.

According to Reiser (2001, 2018b), although we, the field experts, are aware that instructional technology does not only consist of media and technological tools, but also guides learning-teaching processes and provides an increase in performance, this diversity is perceived under one concept, namely the education or instructional technology and creates a "media" perception. In this regard, the field of instructional design and technology encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation and management of instructional and no-instructional processes and resources intended to improve learning and performance in a variety of settings, particularly educational institutions and the workplace.

In this direction, professionals in the field of instructional design and technology generally apply systematic instructional design procedures and use various instructional tools to achieve their goals. They are also interested in non-instructional solutions to performance problems. Moreover, research and theories related to each of these fields are also an important part of the field (Reiser, 2018b).

In the evolution process of the field of instructional design and technology spanning over a century, the roles of the field expert, or to put it more clearly, the instructional designer are also transforming. Learning methods are expanding to include new fields such as approaches that try to understand how today's individual learns with technology, online interaction, artificial intelligence, meta-verse, and connectionism or new fields that try to understand the nature of the human brain such as information science, data science, cognition, and neuroscience. The pandemic period, in all this diversity, has brought the field of instructional design and technology and its applications, with all components of the formal education system, closer than ever before across the world. Understandably, all these developments trigger the transformation and diversity in the roles and responsibilities of the instructional designer. With this perspective, this study aims to examine the current working area of the instructional designer as an instructional design and technology field expert, considering the effects of the pandemic. In this direction, the study seeks to identify which concepts and conceptual

relationship structures shaped research on instructional design during the pre-pandemic period and post-pandemic period, specifically from 2017 to 2022.

Method

The study was carried out with the bibliographic mapping method. Bibliographic mapping (also used as science mapping) is a fundamental research method in the field of bibliometrics, which tries to understand the nature and development of scientific fields by analyzing scientific texts with mathematical and statistical methods (Pritchard, 1969; Morris & Van Der Veer Martens, 2008; Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2011). With this method, over bibliographic data obtained from sources such as scientific databases, scientific cooperation between authors, fields, institutions, countries, as well as coexistence relations between concepts or citations can be revealed.

Data Obtaining Process

Data was extracted from Web of Science (WOS) Core Collection database on 03 October 2022. The global online distance education movement resulting from the Covid 19 Pandemic has been accepted as a breaking point for the field of instructional design and instructional designer roles. Assuming that the effects of this break appear in the literature as of 2020, two search periods have been established. Thus, the similarities and differences between these periods could be compared. The search area was chosen as ‘topic’ which included topic field title, abstract, author keywords and the search terms [“instructional design" or "instructional designer"] were chosen. Thus, a total of 2397 scientific texts containing the search terms in their title, abstract or keywords were accessed. The bibliographic data related to these texts were exported and saved from the database with the record content of "full record and cited references". Table 1 presents general information about the searched periods and the number and types of studies included in the scope of these periods.

Table 1. Searched periods and accessed scientific texts

	Pre-pandemic	**Post-pandemic**
Search Period	04.01.2017-31.12.2019 (32 months)	01.01.2020-03.10.2022 (32 months)
Number of texts	1173	1224
Text types	Article (65%) Proceeding Paper (25.0%) Review Article (4.0%) Book chapters (3.2%) Editorial Material (1.6%) Book Review (0.8%) Meeting Abstract (0.2%), Book, Correction, Data paper (0.2%)	Article (71.5%) Proceeding Paper (9.6%) Early Access (9%) Review Article (7.2%) Editorial Material (1,2%) Book chapters (0.7%) Book Review (0.4%), Book, Correction, Data paper, Letter, Meeting Abstract, Reprint (0.4%)
Distribution by years	2017(155), 2018(510), 2019(508)	2020(482), 2021(482), 2022(260)

The Analysis Procedures

The analysis process was carried out with the software tool from WOSviewer 1.6.9 developed by Van Eck and Waltman (2018). WOSviewer is a widely used tool in bibliographic mapping studies. This tool can analyze the relationship structures within the bibliographic data set. It can both illustrate this relationship structure in the form of a network/map and create

detailed tables (outputs) containing information such as occurrences, total link strength, and average publication year for each concept on the map. WOSviewer was used in this study, because of its power to produce quality results related to the research problem. In the study, both the maps and the detailed information that emerged in the outputs were used.

On the basis of the research problem, co-occurrence analyzes were conducted on the data. In this study, co-occurrence analyzes included the keywords (author keywords) in the texts. Co-occurrence is a type of analysis that reveals the most used concepts, the changes that occur in the concept pattern over time, and the relations of use of the concepts together through the keywords in the analyzed texts (Callon, Courtial, Turner, & Bauin, 1983; Van Eck & Waltman 2018). In this study, co-occurrence analyzes comprised the keywords (author keywords) in the texts.

The full counting method was used to determine the weights of the keywords on the map to be created. In the full count method, each concept searched in the analysis process (each keyword for this study) is equal and has a value of 1. It is not proportional to parameters such as the number of authors (van Eck & Waltman, 2018).

A critical stage of bibliographic mapping works is to determine the selection criteria, in other words, thresholds for the maps to be produced. If the thresholds are not determined, extremely complex, incomprehensible maps can be encountered, in which concepts overlap each other and some important concepts are lost. Therefore, it can be quite difficult to understand and interpret the resulting maps.

At this point in the study, the focus was on ensuring clarity and preserving as many details as possible. Thus, by trying different thresholds, reaching the most understandable maps that cover the most concepts and relationship structures was aimed. The thresholds determined for the concepts to be included in the maps and the selected concept numbers are given in Table 2.

Table 2. Analyses and their descriptive

Analyses	***Data type***	***Counting Method***	***Unit of Analysis***	***Number of terms***	***Thresholds***	***Selected terms***
Co-occurrence	Bibliographic data	Full counting	Author Keywords	Pre-pandemic: 3065 Post-pandemic: 3362	Minimum number of occurrences of a keyword =2	Pre-pandemic: 529 Post-pandemic: 649

Note: The following spellings "instructional design" and "ınstructional design" were encountered in the maps, but both were kept in order not to manipulate the relationship structures.

Among the keywords reached in the study, those included in at least two different texts entered the co-occurrence maps. Thus, 529 concepts for pre-pandemic and 649 concepts for post-pandemic were included in the map. The representation power of the selected concepts is quite high. The relationship weight (total link strength) of the concepts in the pre-pandemic map in the data set constitutes 65.85% of the total relationship weight. For the post-pandemic map, the relationship weight of the concepts within this period constitutes 71.78% of the total weight. Therefore, the power of the maps created to represent the real situation in the data set is high. This supports the validity of the results obtained.

A dual-phase trajectory was pursued during the development of emerging concepts. In the first stage, date ranges were determined for emerging concepts. For this, the "Overlay Visualization"

option, which is a feature offered by WOSviewer and reveals current concepts, was used. The average publication year threshold was determined as 2018.5 for pre-pandemic current concepts and 2021.2 for post-pandemic current concepts.

In the second stage, the total relationship strength (total link strength) of the concepts in the current time intervals in both pre-pandemic and post-pandemic maps were examined and concepts with a relationship strength of 10 and above were accepted as emerging. Emerging concepts were analyzed according to the instructional design research component they refer to (theory/approach/model, variable, technology/media/tool, context, research methodology, person). These components were determined by the research team with an inductive content analysis approach.

Results

Co-occurrence maps before and after the Pandemic are presented in Figures 1 and 2, and the most frequently encountered concepts and their occurrences in the co-occurrence map are presented in Table 3.

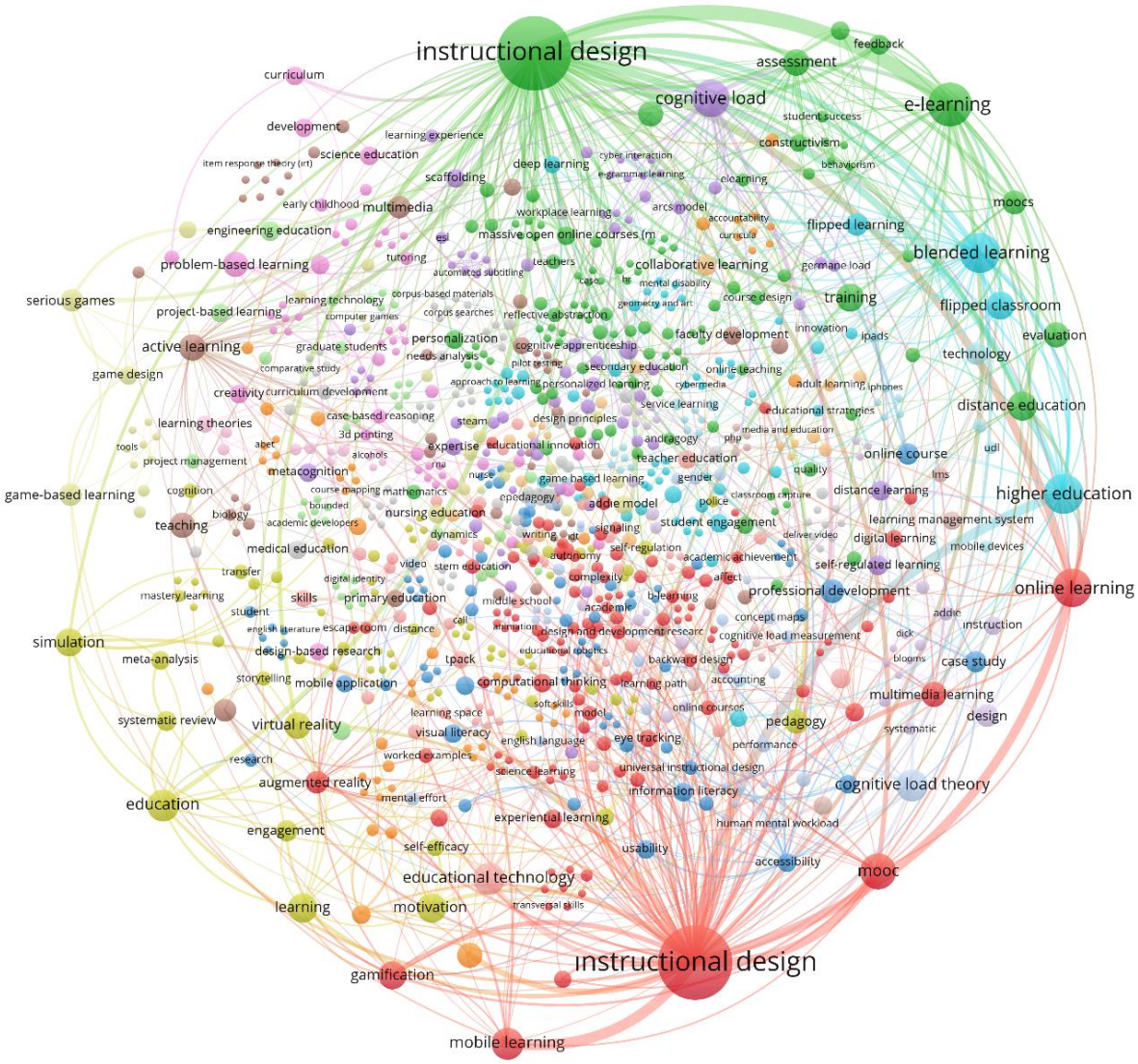

Figure 1: Pre-pandemic co-occurrence map

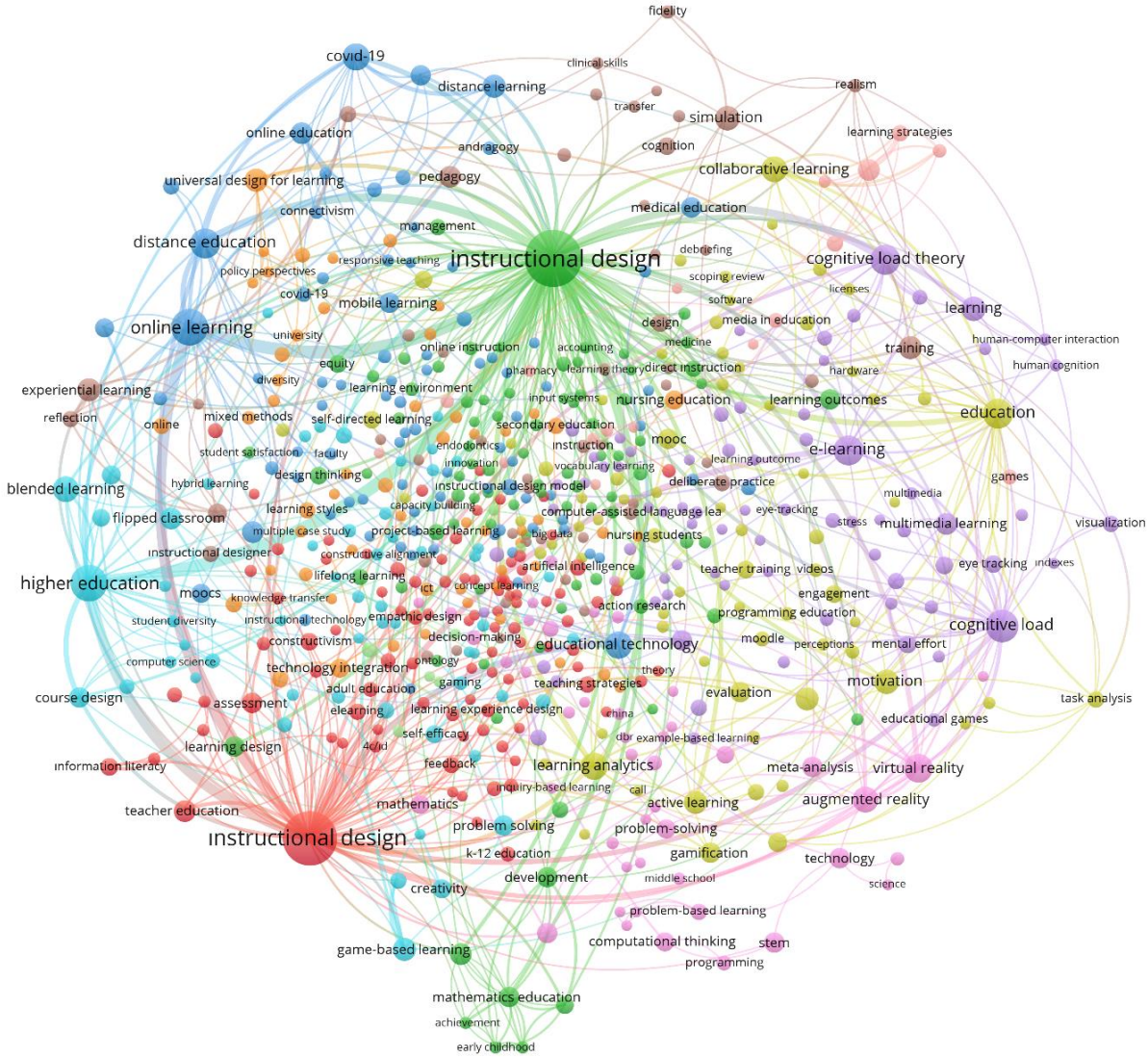

Figure 2: Post-pandemic co-occurrence map

Table 3: Most common concepts (Top 25)

Pre-pandemic	***Post-pandemic***
e-learning (53)	higher education (64)
higher education (43)	online learning (62)
blended learning (40)	cognitive load (47)
online learning (39)	e-learning (36)
cognitive load (36)	distance education (35)
MOOC (31)	education (34)
educational technology (24)	virtual reality (30)
cognitive load theory (23)	covıd-19 (28)
education (23)	learning analytics (27)
mobile learning (23)	educational technology (25)
distance education (19)	blended learning (23)
learning (19)	collaborative learning (23)
motivation (19)	augmented reality (22)
gamification (18)	learning (21)
training (18)	motivation (20)
simulation (17)	simulation (19)
flipped classroom (17)	distance learning (18)
virtual reality (15)	systematic review (18)

assessment (15)	game-based learning (17)
active learning (15)	training (17)
collaboration (14)	universal design for learning (16)
multimedia learning (14)	active learning (16)
evaluation (13)	experiential learning (16)
teaching (13)	curriculum (15)
learning analytics (13)	flipped classroom (15)

When the concepts that have been studied extensively before and after the pandemic are examined, the first significant feature appears to be continuity. Four of the top five most studied concepts of both time frames are the same. Many similar concepts are found in both groups also down the lists. Additionally, with the pandemic period, as expected, the concept of distance education comes to the fore. Another significant feature is the presence of theoretical weight before the Pandemic and its having been replaced by more practical concepts such as virtual reality and augmented reality after the Pandemic.

As another feature of the post-pandemic period, it is observed that methodology concepts such as learning analytics and systematic review were present in the list of the most studied concepts. Another distinctive feature is that the pre-pandemic period dealt with the instructional design process of concepts in the form of theoretical approaches and learning environments on the basis of learning-teaching environments while the post-pandemic period moves beyond the learning-teaching environment expanding to areas such as professional development and the design of teaching programs (or simply training and curriculum).

Examination of emerging concepts show a similar expansion both in the field of instructional design and designer roles. It can be concluded that although the period before and after the pandemic is equal in terms of both the time interval and the number of publications selected, there is a significant expansion and diversification in emerging concepts. These concepts are presented with a classification developed to facilitate understanding the course of expansion in Table 4.

Table 4 shows that while an expansion and diversification has emerged in almost every field after the Pandemic, the theoretical field concepts have decreased. This situation supports the case observed in the most encountered concepts, leading us to believe that post-pandemic research tends to understand the existing educational practices, probably with the influence of the pandemic, rather than testing theoretical perspectives or models. Within this structure, theoretical perspectives also focus on interaction, experience-based learning processes, educational innovation, and sustainability. The variables handled in design research in the pre-pandemic period focus on concepts such as the development of 21st century skills, cognition, access, reflective reasoning, computational thinking, analysis of learning structures, attachment, evaluation, and feedback.

After the pandemic, it is seen that this field of study has expanded with concepts such as teaching, peer learning, collaborative learning, deep learning, instructor competencies, professional development of instructors, student diversity and social impact. In the post-pandemic period, this expansion goes beyond instructional design thinking to develop specific skills within specific design cycles and reveals that it touches upon differences, society, teachers, the designer, and the design work itself with a scientific perspective. In addition, concepts such as design thinking, design judgment, and design studios indicate that the nature of instructional design work and the roles of the designer began to be considered as variables of the design process within this period. The concepts of the technology resources used do not

change much in both periods. The fact that the technologies used do not vary much while the variables examined are extremely diversified; again, as a possible effect of the pandemic, provides evidence that the field of instructional design is evolving from the perspective of adapting innovative technologies to educational environments, to examining these innovative technologies within existing/real educational applications by considering wide impact frameworks.

Also, in terms of the studied contexts, there is a significant diversification after the Pandemic. In addition to dealing with the teaching of various fields before the pandemic, online learning, virtual learning environments for levels such as higher education, K-12, secondary education before the pandemic; micro and macro level elements such as distance education, design of online courses, micro-credentials, graduate education, professional development of instructors, educational policies and educational and technological dimensions were added after the pandemic. All this diversity also increases the methodological diversity of research in the post-pandemic period. Similarly, the human elements that the field research touches upon include the student-teacher-designer as well as the adult learner, specialist and pre-service teacher.

Table 4: Emerging concepts

	Pre-pandemic	**Post-pandemic**
Theory, Approach, & Model	ADDIE, ARCS model, Bloom, Carey, Dick, Gagne, cognitive load theory, cognitive theory of multimedia learning (ctml), cognitivism, community of inquiry conceptual model for design, educational strategies educational technologies, example-based learning, flipped learning, game design, innovation, instruction, instructional design models, learning theories, learning theory, motivation model, pedagogy, project-based learning, Rasch model, self-directed learning, social constructivism, stem, systematic, technology integration, unified modeling, universal design, universal design for learning (udl), variation theory	4C, activity theory, behavioral sciences, educational innovation, example-based learning, game theory, ID model, instruction, instructional design models, learning experience design, prescriptive pedagogy, professionalism, self-determination theory, sustainability, taxonomy
Design Concepts/Variables	accessibility, case-based reasoning, cognition, cognitive load types, computational thinking, cyber interaction, direct instructions, engagement, evaluation, feedback, formative evaluation, human mental workload, information literacy, interaction, interactive, interactivity, leadership, learning experience, learning path, learning trajectories, life skills, mastery learning, motivation, nontechnical skills peer assessment, performance, reading comprehension, scaffolding, sdg-4, self-competences, self-efficacy, sensitivity, situation awareness, situational awareness, skills, student learning, teamwork, transversal skills, tutoring, user experience, worked examples	academic self-efficacy, acceptance, accounting, adult learning, age, attitudes, co-creation, cognitive load (cl), communication skills, complex skills, consultation skills, cooperative, critical thinking, deep learning, design studios, design judgment, design thinking, diagnostic error, differentiate instruction, digital learning identity, digital literacy, effectiveness, effort expectancy, extraneous load, facilitating conditions, facilitation, general practice, germane load, grade level, instructor support, leadership, learner-content interaction learning motivation, management, mechanism design, mental load, pedagogy agent, peer learning (pl), peer mentoring, performance evaluation, performance expectancy problem solving, professional practice, retention, self-explanation, sequencing, social influence, student diversity, student-to, student connectedness, teaching methods, transfer
Technology, Media, & Tool	blackboard, educational games, games, learning, management systems (lms), massive open online courses (moocs), mooc, mobile devices, serious games, simulation, smart communications, smart networks solid modeling, storytelling, tools, video games, video lectures, virtual reality, virtualization	access technologies, animation, apps, artificial intelligence, blackboard, digital badges, digital escape game, educational escape game, escape room game, handheld computers, intelligent tutoring systems, massive open online course, simulations, virtual classroom, virtual patients

Context	art education, basic science, community college, computer science, e-grammar learning, e-learning, engineering education, entertainment industry, faculty development, higher education, k-12, library, library instruction, mathematics education, online course development, online course, online education, organic chemistry, science education, secondary education, second-year undergraduate, simulation training, software engineering, undergraduate medical education, virtual education	college, design education, distance education and online learning, educational perspectives, educational policy, electronic learning, elementary education, ethnic, faculty, faculty development, higher educational institutions, k-12 education, learning disability, management education medical education research, medicine, micro-credential, m-learning, online courses, online medical teaching, open learning, PhD, physiology, policy perspectives, teacher professional development, technology perspectives, undergraduate, virtual learning, web-based instruction
Methodology	case study, concept maps, content analysis design-based research, experimental design, inquiry methods, proposals, quality matters, reliability validity	case study, checklist, correlation, literature review, mathematical models, meta-analysis, methodology, mixed methods, multiple case study, qualitative research scoping review, social network analysis, validity
Persons	adolescents, instructional designer, refugees, student, teachers	adult learner, instructional designer, medical students, older adults, pre-service teachers, professionals, women

Discussion and Conclusion

The main finding of this study, which examines instructional design research from 2017 to 2022 by considering the Covid-19 pandemic as a turning point through keywords, is that the understanding of instructional design and, of course, the roles and responsibilities of instructional designers are expanding in the 2020s. While the most frequently encountered concepts in both periods are similar, it is observed that the emphasis on designing the learning environment before the pandemic has expanded towards a more macro perspective with the pandemic. The emerging concepts provide a much broader perspective on the expansion and diversification that has occurred after the pandemic.

As a result, in post-pandemic research, elements such as design concepts, variables, context, research methodologies, and individuals are expanding. This indicates that instructional designers will perform their work as both researchers and practitioners in a broader set of concepts/variables in the upcoming period. This set encompasses learning as a whole in relation to different and multiple contexts, technology, individuals and culture, thus leading to a curriculum understanding that encompasses all these elements along with their relational structures. Within this understanding, advanced education levels such as PhD, different societal layers such as experts, elderly individuals, and women; cultural backgrounds, and various psychological and sociological perspectives can become subjects of instructional design. Parallel to this, our methodological perspective is expanding to incorporate multiple approaches. Interestingly, in this expansion, there is a decrease in the emphasis on theory, approach, and model in research.

The results holistically indicate that within the century-long history of instructional design and technology, certain characteristic features are changing. One of these features is our experimental view to research in the field. Instructional design inherently focuses on the practical applications of theory and technology to solve instructional problems (Ren, 2022; Kumar & Ritzhaupt, 2017). Within this perspective, innovations in learning, teaching, and technology are often implemented and the results are compared to traditional educational processes. In other words, instructional design and technology is creating innovative alternatives to traditional education. However, it can be argued that until the pandemic, the prevalence of these alternatives had never been as extensive as traditional educational practices. The pandemic period, with the transition to distance education on a global scale, realistically highlighted the challenges and dilemmas of online teaching and learning processes. During this process, the field of instructional design and technology also shifted from an experimental perspective to a problem-solving approach, aiming to understand and address these issues and their different components.

Similarly, the second feature of changing instructional design is its theory-driven characteristic. Since the mid-1950s, various design models have been developed in the field and design processes often progress based on these models. However, the results of this study reveal a decrease in the emphasis on theory and models in research. Just as in the experimental perspective, it is easy to develop alternatives to traditional educational processes based on certain theoretical approaches and assumptions. However, when innovative practices cease to be alternatives and become integral components of the education system, what becomes crucial is not the theoretical foundation on which you build but rather your ability to eliminate the problems at hand. At this point, it can be argued that with the pandemic, the field is transitioning towards a more reality-driven approach. In their research focusing on the changes in the roles

of instructional designers in higher education institutions in the United States during the pandemic, Xie, Gulinna, and Rice (2021) reveal, in support of our findings, that the roles of instructional designers have expanded towards areas such as building relationships within the university community.

Some of the specific actions that were undertaken included the gathering, arranging, and dissemination of resources, the establishment of workshops aiming at faculty course enhancement, offering technological assistance, and advocating for both students and the advancement of their profession. This expansion effect, which aligns with our findings, incorporates a group of design practices into teaching/educational competencies, thus triggering a supportive approach to enhancing the design skills of teaching faculty within their roles as instructional designers (Muljana, 2021; Xie, Gulinna, Rice, & Griswold, 2021; Jen, 2022).

The effects of the pandemic have led to an increase in online learning activities where students from various cultures come together. This, as indicated by the results of this study, highlights the importance of fostering intercultural learning and emphasizes the role of empathy and empathic design within the field (Ren, 2022; Tracey & Baaki, 2022). One possible reason for the decrease in emphasis on theory and models in instructional design research may be, as previously suggested by Ganesan, Edmonds, and Spector (2002), the rapid diversification and expansion of our individual learning networks during this period, which renders existing perspectives inadequate in explaining learning and therefore improving instructional design. The increased momentum of learning during the pandemic's "new normal" further amplifies this diversity. With this perspective, a reality-driven approach can contribute to the development of new theoretical perspectives through innovative solutions to current instructional challenges and the transformation of ideas such as connectivism into more robust scientific perspectives.

An interesting result from the study is that while instructional processes have naturally expanded with the availability of various technological tools and resources during the pandemic, a similar expansion is not observed in the concepts related to technology as discussed in design research. During this period, the extension of technology concepts is mainly limited to a set of components associated with distance education. This once again leads us to the debate of traditional media versus methods (Clark, 1994; Kozma, 1994). While education systems globally are moving towards a richer technological environment, the field of instructional design and technology predominantly engages in discussions on method concepts, encompassing a wide range of contexts and human factors. As the environment becomes richer in terms of media, the emphasis on methods may potentially shift the debate to a different point. The significant changes in media, in line with Kozma's (1994) proposition, prompt us to reconsider the method in a more comprehensive manner. On the other hand, as traditional education systems and processes become more technologically advanced, they align with Clark's (1994) idea of shifting the focus from media to methods.

Limitations

It is necessary to mention some limitations in terms of evaluating the results of the study. This study was conducted on scientific texts scanned in the WOS Core Collection. Of course, there may be many other studies in the field of instructional design outside of this database. Working with multiple databases in such research can make data management difficult and create duplication problems, such as including the same text multiple times. To avoid this problem, researchers have worked with a single database. By selecting the WOS database, the

aim was to include more qualitative, reliable, and high-impact texts in the scope of the study. Considering that access was available to nearly 3000 scientific texts, it can be said that the representativeness of the selection is high. Similar limitations can be discussed regarding the chosen search terms and time frame. Of course, there are many instructional design studies beyond the selected search terms and time frame. Researchers have made these choices with similar considerations to access scientific texts that are closest to the main idea of the study. It is believed that future studies conducted through different databases and search terms, covering different time frames, will contribute to revealing the changes in the field of instructional design and, consequently, the role and responsibilities of the designer.

Another limitation of the study that can be highlighted is the inclusion of both "instructional design" and "instructional design" keywords in the maps. As Nguyen and Hallinger (2020) suggest, in bibliographic mapping, one of the similar concepts—typically the stronger one—should be preferred. However, in this study, the occurrences and total link strengths of both keywords were remarkably high and closely aligned. Therefore, both were retained in the maps to achieve an optimal conceptual pattern related to the instructional design phenomenon. Researchers believe that this issue, which stems from not accounting for English letter variations in upper-lower case conversions during the bibliographic data production process of scientific journals, could emerge as a significant problem in future mapping studies and should be addressed with care.

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