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Educational Transformation in the Digital Age: Integration of Chatgpt and Icts in University Education

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Abstract

A documentary review was carried out on the production and publication of research papers related to the study of the variables Digital Age, ICT and Higher Education as online resources within the different study methodologies at the university level. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2018-2023 with respect to the study of the aforementioned variables, achieving the identification of 39 publications in total. The information provided by this platform was organized through graphs and figures, categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics have been described, the position of different authors on the proposed topic is referenced through a qualitative analysis. Among the main findings made through this research, it is found that India and Malaysia, with 6 publications, were the countries with the highest scientific production registered in the name of authors affiliated with institutions of these nations. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material related to the study of the Digital Age, ICT and Higher Education was Social Sciences with 24 published documents, and the Type of Publication that was most used during the period indicated above was the Journal Article, which represents 49% of the total scientific production.

Keywords: *Ict, Databases, Higher Education, Online Resources.*

1. Introduction

In the 21st century, which has stood out for the large-scale evolution of several productive sectors, these have led to a transformation of technologies which have contributed to growth on a global scale. These cutting-edge technologies have made universities ready for modern education, which has been characterized by changes in learning models, teaching styles, innovation factors, and more. The educational transformation has led to a change in the paradigms of learning hand in hand with the innovative factor, and the incorporation of information and communication technologies is a key driver for this transformation. Among the transformative technologies that are making waves in academia, the integration of advanced language models, exemplified by ChatGPT, stands out as a revolutionary force poised to reshape the dynamics of university education.

In the past, higher education has been characterized by traditional formats based on lectures

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and standardized assessments. However, this was left behind thanks to the arrival of the fourth industrial revolution, which marked a before and after in this educational sector, which was characterized by moving away from these traditional educational practices and focusing on the incorporation of new educational practices and technologies in order to improve the learning experience. The fusion of educational transformation, ICT, and ChatGPT's capabilities promises to create an immersive, dynamic, and personalized educational environment.

One of the benefits that ICT brings with it is to grant students access to vast repositories of knowledge that the network brings, which allows universities to transcend the physical borders of conventional classrooms and offer students access to knowledge online. This incorporation not only improves the standards of education, but also democratizes learning models, allowing global access to education. This globalization in education closes educational gaps and opens up new avenues of collaboration, improving research processes opens the way to new innovative teaching methods. While remotely universities adopt online learning platforms, cloud-based resources, and virtual collaboration tools, they pave the way for a more inclusive and flexible education ecosystem.

Based on this context, it can be said that the incorporation of ChatGPT in universities is significant, as it has addressed several aspects in learning processes. One of the most impactful features of running this resource is that it actively improves student engagement. The natural language interface that this resource promotes is to create a more fertile environment dedicated to learning, to have a more interactive and dynamic environment, this in order to motivate students to learn and generate an environment of active participation.

The correlation between ICT and ChatGPT in universities constitutes a transcendental change in the already established pedagogical models and seeks to ensure that teaching standards are improved by the hand of these two resources. With the help of game-changing agents, educators can focus on fostering creativity, critical analysis, and collaboration, while AI efficiently handles routine tasks. the symbiotic correlation between human instructors and AI-powered tools fosters a holistic educational experience, tailored to individual learning styles and preferences. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variables Digital Era, ICT and Higher Education, as well. Such as the description of the position of certain authors affiliated with institutions, during the period between 2018 and 2023.

2. General Objective

To analyze, from a bibliometric and bibliographic perspective, the production of research works on the variables Digital Age, ICT and Higher Education registered in Scopus during the period 2017-2022.

3. Methodology

A quantitative analysis of the information provided by Scopus is carried out under a bibliometric approach on the scientific production related to the study of the variables Digital Era, ICT and Higher Education. Likewise, from a qualitative perspective, examples of some research works published in the area of study mentioned above are analyzed, from a bibliographic approach to describe the position of different authors regarding the proposed topic.

The search is carried out through the tool provided by Scopus and parameters referenced in Figure 1 are established.

3.1 Methodological Design

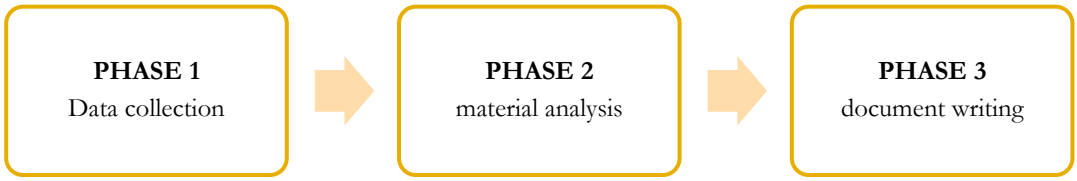

Figure 1: Methodological Design.
Source: Authors.

3.1.1 Phase 1: Data Collection

Data collection was carried out through the Search tool on the Scopus website, through which a total of 39 publications were identified. To this end, search filters were established consisting of:

- ✓ TITLE-ABS-KEY (digital AND era, and ict, AND higher AND education) AND PUBYEAR > 2017 AND PUBYEAR < 2024
- ✓ Published documents whose study variables are related to the study of the Digital Era, ICT and Higher Education variables.
- ✓ Without distinction of country of origin.
- ✓ Without distinction of area of knowledge.
- ✓ No distinction of type of publication.

3.1.2 Phase 2: Construction of Analytical Material

The information identified in the previous phase is organized. The classification will be made by means of graphs, figures and tables based on data provided by Scopus.

- ✓ Co-occurrence of Words.
- ✓ Year of publication
- ✓ Country of origin of the publication.
- ✓ Area of knowledge.
- ✓ Publication Type

3.1.3 Phase 3: Drafting of Conclusions and Outcome Document

After the analysis carried out in the previous phase, we proceed to the drafting of the conclusions and preparation of the final document.

4. Results

4.1 Co-Occurrence of Words

Figure 2 shows the co-occurrence of keywords within the publications identified in the Scopus database.

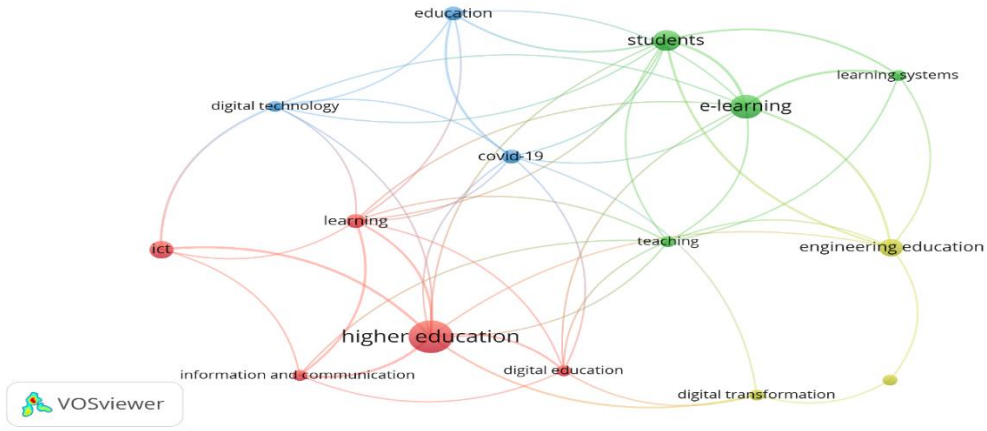

Figure 2: Co-Occurrence of Words.
Source: Authors' Own Elaboration (2023); Based on Data Provided by Scopus.

Digital technology was the most frequently used keyword within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Higher Education is among the most frequently used variables, associated with variables such as Artificial Intelligence, Students, Digital Education, Learning System, Innovative Technology, Communication and Information, Digital Transformation. As we delve deeper into the realms of educational transformation, the fusion of ChatGPT and ICT emerges as a catalyst to cultivate a generation of students equipped with the skills needed to thrive in a rapidly changing world. This transformation not only redefines the role of educators, but also reshapes the very structure of how knowledge is acquired, disseminated, and applied in the higher education landscape. In this comprehensive exploration, we will delve into the multifaceted dimensions of this transformative journey and elucidate the potential impact on the future of higher education.

4.2 Distribution of Scientific Production by Year of Publication

Figure 3 shows how scientific production is distributed according to the year of publication, taking into account that the period between 2017 and 2022 is taken

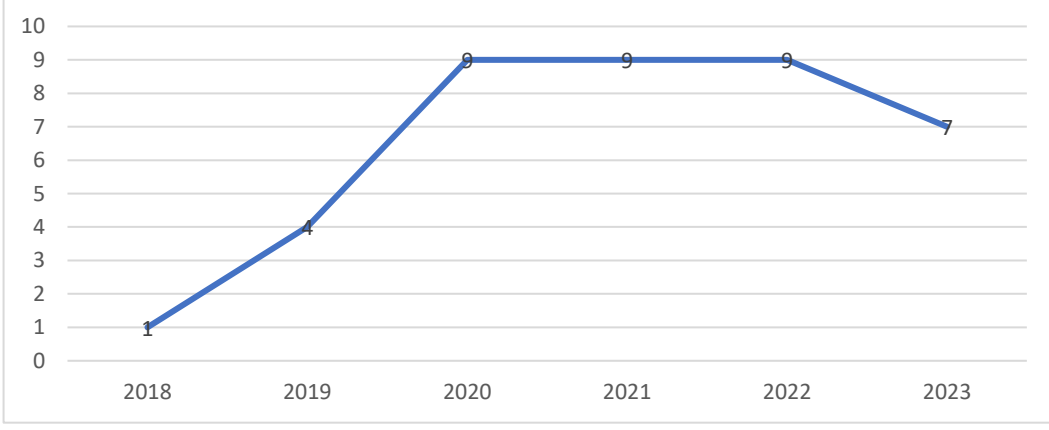

Figure 3: Distribution of Scientific Production by Year of Publication.
Source: Authors' Own Elaboration (2023); Based on Data Provided by Scopus.

Among the main characteristics evidenced by the distribution of scientific production by year of publication, a stability in the number of publications registered in Scopus during the years 2020, 2021, 2022 is notorious, reaching a total of 9 documents published in journals indexed on this platform. This can be explained by articles such as "Addiction, Hijacking and Technology Adoption in Higher Education: A Bird's Eye View of ICT4AD Policy in Ghana 20 Years Later" This article measures the progress of ICT4AD policy after two decades, presents a complex explanation of why technology integration in higher education in Ghana is still in its infancy, and proposes interventions to sustain and promote the goals of the ICT4AD policy. From an extensive review of the literature on three conceptualized thematic topics related to technology (i.e., addiction, kidnapping, and adoption), education policymakers and higher education stakeholders will be able to identify their roles in ensuring the success of the enacted ICT4AD policy. The study also discusses viable areas of research. Notes for the practitioner What is already known about this topic? Ghana's enacted policy on Information and Communication Technologies for Accelerated Development (ICT4AD) hopes to transform the country into a technology-driven economy. The integration of technology into education and society is still in its infancy in Ghana in this information age. What does this article contribute? It measures the progress of ICT4AD policy and presents a complex explanation of why technology integration in higher education in Ghana is still in its infancy and proposes interventions to sustain and promote ICT4AD policy objectives. It sounds the alarm that ICT4AD policy is in its final stage and calls on education policymakers to review and revise the policy. It identifies the main factors limiting effective technology integration in Ghana.(Adarkwah, 2023)

4.3 Distribution of Scientific Production by Country of Origin

Figure 4 shows how the scientific production is distributed according to the nationality of the authors.

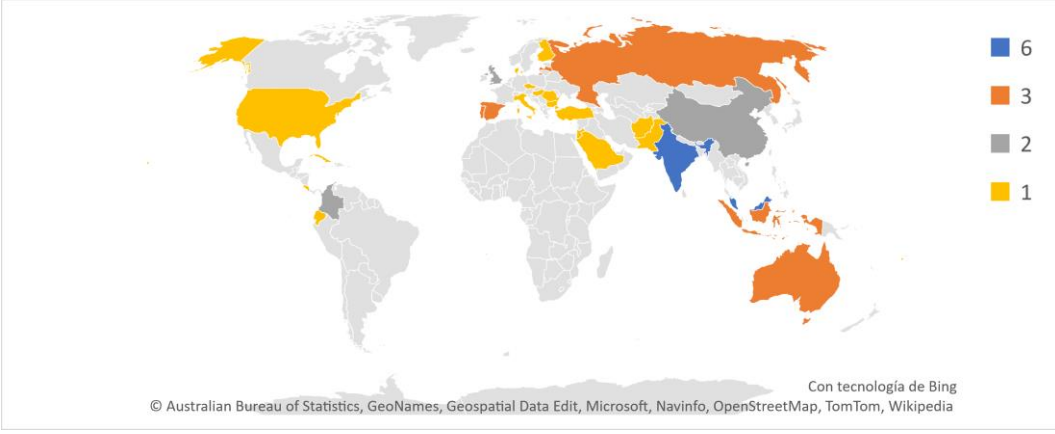

Figure 4: Distribution of Scientific Production by Country of Origin.
Source: Authors' Own Elaboration (2023); Based on Data Provided by Scopus.

Within the distribution of scientific production by country of origin, registrations from institutions were taken into account, establishing India as the country of this community, with the highest number of publications indexed in Scopus during the period 2018-2023, with a total of 6 publications in total. In second place, Australia with 3 scientific papers, and the United Kingdom occupying the third place presenting to the scientific community, with a total of 2

documents among which is the article entitled "Assessing the drivers of digital transformation in higher education institutions in the era of industry 4.0 according to the decision-making method" a main objective of universities and schools is to prepare future professionals capable of Face problems and seek effective solutions based on their digital competence as a key skill. In this regard, a new framework is developed to assess the main drivers of digital transformation in higher education institutions (HEIs) in the era of Industry 4.0. The developed framework proposes a decision-making approach that can effectively use the information presented to make highly rational decisions. This framework is applied to calculate the weights of subjective and objective criteria, and is used to assess the preferences of organizations. An empirical case study is taken to evaluate the main drivers of the implementation of digital transformation in HEIs. According to the findings, the most important drivers for the implementation of digital transformation in HEIs in the Industry 4.0 era are the development, updating and adaptation of a curriculum (0.0425), the integration of digital technologies for universal education (0.0420) and cloud computing. (0.0419), respectively.(Wang, 2023)

4.4 Distribution of Scientific Production by Area of Knowledge

Figure 5 shows how the production of scientific publications is distributed according to the area of knowledge through which the different research methodologies are executed.

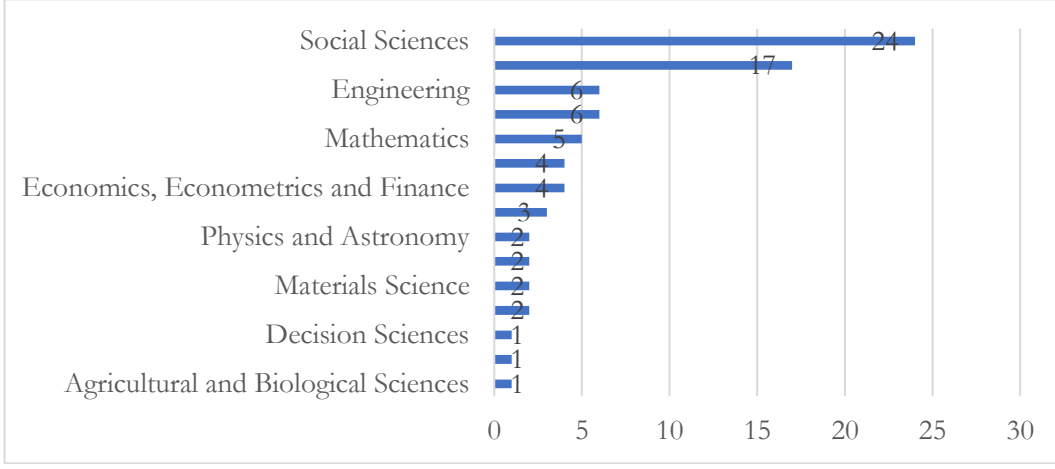

Figure 5: Distribution of Scientific Production by Area of Knowledge.
Source: Authors' Own Elaboration (2023); Based on Data Provided by Scopus.

Social Sciences was the area of knowledge with the highest number of publications registered in Scopus with a total of 24 documents that have based their methodologies Digital Age, ICT and Higher Education. In second place, Computer Science with 17 articles and Engineering in third place with 6. The above can be explained thanks to the contribution and study of different branches, the article with the greatest impact was registered by Social Sciences entitled "The need to integrate digital education in higher education: challenges and opportunities" This article tries to offer deep reflections on the potential and future difficulties of information and communication technologies (ICT) and digital education in their relationship with the adoption of technological advances in the digital age and extensive open online courses. With the development of internet technology, we have observed a significant shift in the way we communicate and collaborate among academics. The digital

revolution fostered unfettered access to information on a global scale. Today's classrooms are equipped with a wealth of ICT tools and almost all instructors have made significant strides in integrating digital technology to improve students' access to information and cooperative learning opportunities. The higher education system must seek to use the power of ICTs to be competitive and provide high-quality education as a consequence of digital transformation, disruptive technological innovations, and accelerated change. To achieve these ambitions, this article outlines some challenges facing higher education, as well as the technological resources and methodologies they have used in the current scenario to transform higher education to embrace digital transformation. The article aims to synthesize important insights that can be applied to the digitalization of higher education in the present and near future.(Alenezi, 2023)

4.5 Type of Publication

Figure 6 shows how the bibliography is distributed according to the type of publication chosen by the authors

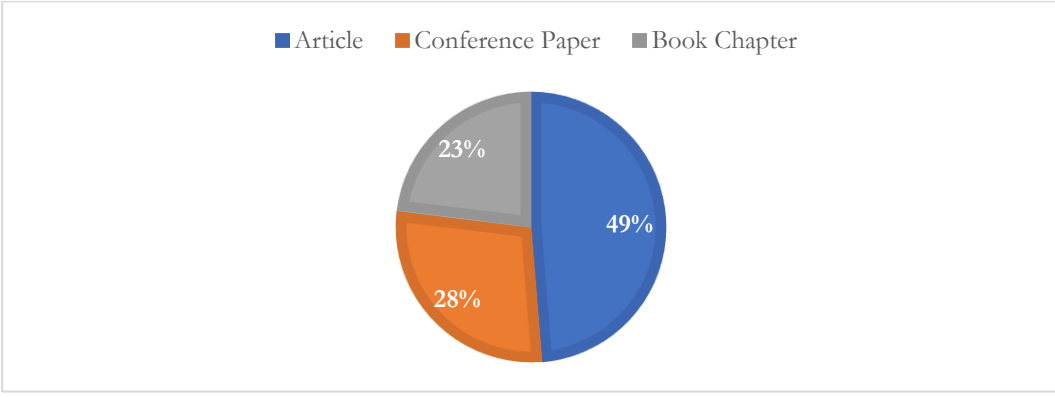

Figure 6: Publication Type.
Source: Authors' Own Elaboration (2023); Based on Data Provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this document was the one entitled Journal Articles with 49% of the total production identified for analysis, followed by Session Paper with 28%. Chapter of the Book are part of this classification, representing 23% of the research papers published during the period 2017-2022, in journals indexed in Scopus. In the latter category, the one titled "Social Health and Psychological Safety of Students Participating in Online Education During the COVID-19 Pandemic" stands out. This paper explores the impacts of the COVID-19 pandemic on student learning and well-being and outlines potential considerations for education systems as they support students during the recovery period and beyond. Our study is based on the results of our own survey which was conducted using a snowball and a convenient sample of 1524 respondents (aged 19-26; 56.2% female and 43.8% male) from the Czech Republic (N = 804) and Russia (N = 720). We used the mixtures of ANOVA and the Generalized Linear Model Dirichlet Process (DP-GLM) to explain the causes of stress and anxiety after grouping variables represented by gender and study specializations. Our results demonstrate that more than 87% of students in the sample expressed medium to high vulnerability to stress, while 58% of respondents were affected by severe anxiety during their participation in online education. The most important factors that emerged as significant were fear of infection and social distancing, while the best coping strategy was self-control.(Korneeva, 2022)

5. Conclusions

Through the bibliometric analysis carried out in this research work, it was established that India was the country with the highest number of records published in the Digital Era, ICT and Higher Education variables. With a total of 6 publications in the Scopus database. In the same way, it was possible to establish that the application of theories framed in the area of Social Sciences, were used more frequently when identifying the benefits that the integration of ICT and ChatGPT brings with it in universities, this in turn brings improvements in learning since it creates a more modern and avant-garde environment creating a more dynamic and interactive environment. Each of these resources individually contributes to academic performance levels. First of all, ChatGPT allows students to interact with academic material in a more adapted way which allows this technological resource to address the different learning styles that exist and address the individual needs of each student, this allows for a more efficient educational environment. On the other hand, ICT offers another variety of resources in universities which guarantees that learning is not limited by geographical or time gaps, this allows the acquisition of online platforms, bibliographic resources or didactic materials to access information at what time, ensuring that each student adapts at his or her own pace. fostering a more inclusive and flexible environment. ICT integration streamlines administrative tasks, freeing up valuable time for educators to focus on their core responsibilities. Automating routine activities such as grading, scheduling, and communication can significantly improve the overall efficiency of educational institutions. However, it is important to mention that being able to manage these beneficial resources to universities is not exempt from presenting challenges and difficulties since the use of them raises ethical concerns regarding privacy, the security of student data and its interface in algorithms. Therefore, it is vitally important that the necessary measures are taken to promote academic performance and at the same time safeguard individual rights. This is why it is important for universities to be able to close the technological gaps that currently exist, to promote an inclusive approach, which helps prevent the exacerbation of educational inequality and promote a more equitable landscape. However, it is important to create dynamic and changing learning spaces where, together with the new technologies of ChatGPT, the emerging impact of the use of ICTs in education is sought to be maximized. This seeks to look at new educational horizons where learning experiences are project-based and centralized in which students take full advantage of the benefits of these technologies, which seeks to promote critical thinking, innovation and teamwork.

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