Visual literacy in Art Education in university contexts

Alfabetización visual en la Educación Artística en contextos universitarios

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RESUMEN.
En un mundo digital, que evoluciona de forma cada vez más veloz hacia la cultura de lo visual, adquirir herramientas de alfabetización visual puede resultar esencial, en especial para el futuro profesional de estudiantes universitarios. La educación artística consigue potenciar el desarrollo del aprendizaje visual y motivar al estudiante en su proceso de análisis, descubrimiento, comprensión, valoración y aprehensión de las artes visuales. El uso de la imagen como herramienta didáctica en el aula favorece el progreso de la observación crítica y reflexiva y promueve las habilidades expresivas. El objetivo de este trabajo fue presentar experiencias sobre el aprendizaje visual en la Educación Artística en contextos universitarios. Se realiza una revisión sistemática de la literatura durante 1990 a 2020. Los resultados permitieron reconocer a los principales agentes autores, sus tendencias de investigación, y revelar ciertas lagunas de conocimiento crítico. Las conclusiones y las tendencias de investigación convergen en las ventajas de incorporar los recursos visuales en la educación superior, enfatizando la importancia de los enfoques sensoriales como apoyo al aprendizaje.

PALABRAS CLAVE.
Educación artística, alfabetización, visual, educación superior.

ABSTRACT.
In a digital world, which is evolving more and more rapidly towards the culture of the visual, acquiring visual literacy tools can be essential, especially for the professional future of university students. Art education manages to enhance the development of visual learning and motivate the student in their process of analysis, discovery, understanding, assessment and apprehension of the visual arts. The use of the image as a teaching tool in the classroom favours the progress of critical and reflective observation and promotes expressive skills. The objective of this work was to present experiences on visual learning in Art Education in university contexts. A systematic review of the literature was carried out during 1990 to 2020.

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The results allowed us to recognize the main author agents, their research tendencies, and reveal certain gaps in critical knowledge. Research findings and trends converge on the advantages of incorporating visual resources in higher education, emphasizing the importance of sensory approaches to support learning.

KEY WORDS.
Artistic education, literacy, visual, higher education.

1. Introduction.

In recent decades, the teaching and learning process has adapted to constant methodological and technological changes. This issue implies that the education sector is faced with the need to adapt to the transformations to develop in students the skills and abilities necessary for their professional future (Akçayır & Akçayır, 2017).

In a society like today's, where the visual code transmitted through a multitude of media prevails, it is important that students are equipped with the necessary resources to critically analyze and interpret the messages that reach them. The use of the image as a teaching tool in the classroom favors the development of critical and reflective observation and promotes the development of expressive skills (Lewis & Holloway, 2019).

The digital and information age in which we are inserted, impregnated with images and visual environments (Eisner, 2002), constantly conditions, modifies and reconfigures the temporality and fragility that the human being acquires as the protagonist of this reality (Phillips, 2019).

We think visually and decode texts by translating them into letters that are ultimately graphic symbols that allow us to communicate with others. In this way, the communicative potential of visual experiences should not only be considered as a communication instrument but also as learning tools.

Various studies show that students learn more and better when they provide information in visual format (Hetland, 2013). Introducing meaningful learning strategies in the classroom that promote improving thinking skills through the presentation of information in visual formats such as images, diagrams, flowcharts, and interactive simulations is currently mandatory (Hailey, 2014).

In this context, visual learning is defined as a teaching and learning method that uses diagrams or graphs both to represent information and to work with ideas and concepts, which when used help to think and learn more effectively (Felten, 2008). It consists of the assimilation of information through the application of visual formats, making students learn to think and study in a more effective way.

Visual information is presented in different formats, such as images, flowcharts, diagrams, video, simulations, graphs, cartoons, coloring books, PowerPoint slide shows, posters, movies, games, and flash cards (McCormack, 2017).

Visual and graphic-based learning strategies help students of all ages better manage learning goals, better understand information, and achieve academic success. In this way, visual learning reinforces in students the development of visual thinking, considered as a learning style through which the student comes to better understand and retain information by associating ideas, words and concepts with images. Visual information is presented through

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various interactive visual tools, such as information and communication technologies and visual environments in 2D and 3D (González-Zamar et al., 2020).

Art education finds in visual learning and images, not only a training vehicle for a visual dimension of knowledge and adaptation with the environment, but it constitutes a cultural phenomenon. The world where the senses awaken is far from being an easy place to understand and in this situation, we seek to attend to the urgency of educating to capture, receive and interpret images, with sufficient conceptual and instrumental knowledge of the phenomenon (Lazotti, 1983).

In recent decades, universities are undergoing a set of important changes, induced by technological and social trends towards digitization. Like all revolutions, the digital revolution entails an intense readjustment in all sectors, from the production and energy chains to the economy and education (Syam & Sharma, 2018). The adoption of technologies in higher education is related to a paradigm shift, conceiving the technological instrument as a complex and interconnected environment that enables digital learning (Mahlow & Hediger, 2019).

In this context, digitization is a necessity in Higher Education Institutions (HEIs) capable of attracting more and better students, improving the experience of courses, teaching materials and the training process in general (Gurung & Rutledge, 2014).

Thus, in the reviewed literature it has been found that digital transformation must be established according to the axioms of connectivism, to unify its commitment to meeting the expectations of different interest groups in the economic, social and environmental dimensions (Shrivastava, 2018).

The purpose of this work is to identify and obtain more information about experiences of visual literacy in Art Education in university contexts. A systematic review of the literature is proposed, to analyse the advantages of working on visual learning in Art Education and the integration of new digital technologies in this learning process. The results showed the contributions in this research field, allowing to recognize the main author agents, their research tendencies, and reveal certain critical knowledge gaps. Thus, it can be concluded that trends converge in the incorporation of visual resources in education and research at all educational levels, emphasizing visual approaches that support learning. Today's Internet applications, with multimedia and telecommunications, support the flexible and dynamic representation of knowledge (González-Zamar & Abad-Segura, 2021c).

Finally, it should be noted that among the lines of research that are currently being developed in relation to the subject of the study, these refer, among others, to the application of models that enhance learning using technologies through an approach latent semantic. Likewise, it seeks to promote educational digitization through visual tools and graphic applications that develop visual literacy skills through works of art.

2. Literature review.

The study of the importance of visual literacy in Art Education in higher education is supported by the analysis of a theoretical framework that together with the basic concepts define the frame of reference in this research work. Hence, some reflections on the terms and concepts used in the context of this research are included.

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Historical accounts of scientific discovery and invention have shown that visualization is a powerful cognitive and inventive tool (Rieber, 1995). The term visualization is familiar to us from the everyday use to which it refers. According to the RAE, the word visualize means “to make visible”, generally by artificial means or on a computer screen. It also means "to represent something through images" and "to form in the mind the visual image of something", that is, to form and manipulate a mental image.

Horton (1993) defined this term as "the ability to understand and use images, including the ability to think, learn and express oneself in terms of images." Therefore, this axiomatic framework serves as a reference for the design of visual literacy programs that develop perceptual abilities and skills and help to learn the elements of the visual alphabet, its syntactic articulation, its semantic decoding, and propose an interpretation within an environmental pragmatics.

Based on these principles, it is possible to affirm that visual literacy needs to be taught because visual skills are not developed processes such as standing or walking (Moore, 1994), but must be stimulated.

Every day of life, visualization is essential for problem solving and spatial reasoning, as it enables people to use concrete media to deal with abstract images (Winner, 2007). The visualization process can involve images drawn on paper with a pencil and even and very especially, includes those mentally imagined investigating, discover and understand concepts, facts and ideas.

Learning through forms of graphic-visual representation can offer advantages over traditional text, given its scope. Some of its benefits lie in facilitating perceptual inference, for example, the relative size of objects; demonstrate proportional relationships between objects and interrelate impressions, etc.

In addition, visualization has been very successful in helping scientists and mathematicians understand and present their research. In this sense, visual forms of representation are very important, not only as heuristic and pedagogical tools, but as legitimate aspects of reasoning and learning. With current advances in technologies, visual experiences that promote higher-order cognition, such as augmented reality (Lee, 2018) can be offered, encouraging students to make use of them and learn multiple modes of representation.

Invention, imagination, and visual thinking are interconnected at the time of creation. Depending on the type of mind map used, it potentiates divergent thinking, spontaneous flexibility, flat hierarchies and, in general, their creativity in students (Buzan, 1996; Lee, 2018; Cheng, 2019).

The ubiquity of visual messages surrounding our society led to an emerging movement for the development of visual literacy skills and spatial skills. In this way, with visual literacy, the ability to understand and make visual statements, allows us to become aware of the world around us, the relationships and the systems of which we are part (Seels, 1994). Visual literacy integrates personal experience and imagination with social, technological, and aesthetic experience. There is an extensive literature on the application of visual literacy skills and knowledge to enhance the teaching and learning process. Some examples are the use of mental mapping and conceptual mapping as learning strategies (Christensen & Olson, 2002;

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Stopar & Bartol, 2019) and the use of dynamic visual support through multimedia to help understanding language through short stories (Sharp et al., 1995).

Cognitive psychologists working with theories of cognitive load recognize that there is greater effective processing capacity of working memory if students work in multiple modes, such as text and graphics. Thus, it is applied that audiovisual factors improve learning only if cognitive resources are not required to relate audiovisual resources (Jeung, Chandler & Sweller, 1997; Scholl & Fitzpatrick, 2020). In addition, students are increasingly able to exercise thinking strategies as long as the computer and the user interface complement the learning objectives and do not distract them.

In recent decades, the visual literacy movement has been gaining considerable momentum, encompassing the learning of multiple aspects of visual communication (Matusiak et al., 2019). Trends converge in the incorporation of visual resources in education and research at all educational levels, thus emphasizing visual approaches that support learning. It is evident that current Internet applications, with multimedia and telecommunications, support the flexible and dynamic representation of knowledge.

Accordingly, educational institutions present the challenge of including a learning system that implements the culture of visual and immersive learning in the educational curriculum of youth and adults, in relation to disruptive technologies and the programing.

In the educational field, digital transformation is a process that requires evolution in the way it is taught and adaptation to the new learning needs of the student. In this way, digital transformation achieves, through digital literacy, the improvement of the capacity of use and application (Abad-Segura et al., 2020). Therefore, it becomes a more efficient experience, which allows collaborative work.

For its part, Art Education aims to develop perceptual, expressive and aesthetic capacities based on theoretical and practical knowledge of visual languages to understand reality, increasingly configured as a world of images and objects that are perceived through sensory stimuli of a visual and tactile nature. At the same time, it seeks to promote the development of imagination, creativity and emotional intelligence, favor critical reasoning in the face of plastic, visual and social reality, provide the necessary skills to use plastic elements as expressive resources and predispose students to the enjoyment of the natural, social and cultural environment (Collado-Ruano, 2017; De Backer et al., 2012; González-Zamar & Abad-Segura, 2021a). A challenge in which conceptualization, creativity and design play a fundamental role.

In this scenario, the most important skills to cultivate in students to prepare them for their professional future are flexibility, passion for learning and creativity, which are the prelude to permanent updating in digital skills. Other fundamental competencies are collaboration, intercultural communication and the use of diversity (Van Laar et al., 2020).

It is interesting to note that creativity is the human capacity to invent, generate ideas and create models and products that are novel and significant. Innovation is applied creativity. It is the implantation of original and appropriate ideas developed through creativity. Innovating consists of transforming ideas into valuable solutions in a certain field. Therefore, creativity leads to innovation (Grigorenko, 2019; González-Zamar & Abad-Segura, 2020).

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The importance of creativity in art education transcends as a dynamic expression of the individual and creative freedom, but also represents the higher needs or meta-needs that motivate the subject to ask fundamental questions. In other words, creativity is an essential part of the subject's cognitive, communicative and transformative learning (Lin & Vartanian, 2018).

The importance of creative thinking in students lies in the fact that it involves two consecutive processes: divergence and convergence. Divergent thinking involves expanding thoughts and ideas, making new connections, and opening up multiple possible areas for exploration. It is when new thoughts and possibilities are generated (González-Zamar & Abad-Segura, 2020). Convergent thinking is when students can establish a connection with society and the reality that surrounds them by progressing this thinking, evaluating the possibilities offered by the environment and discarding weak ideas or those that do not bring them any benefits.

Creativity linked to learning can, therefore, provide an ideal platform to improve the general well-being of students, allowing children to contribute to innovation from their school circle, understanding creativity as the basis of their future. Encouraging the development of creativity and imagination in children through regular creative practice is more beneficial than producing a satisfactory grade.

The European Union encourages creativity and innovation, for both social and economic reasons, showing that creativity is increasingly viewed as a valuable human resource. UNESCO defined creativity as an important tool for the search for a more sustainable future that it considers directly linked to innovation and creative problem solving (Dasli, 2009).

From a pedagogical point of view, it can be said that a society cannot be more creative than its own members. The gifts and talents of each child, and later adults, must be recognized and valued so that these children begin to deeply believe in their own abilities and feel that they can use their gifts and talents to contribute creatively to the future. classroom as well as in society.

Consequently, the link between creativity and visual literacy (Bowler, 2014) could be in this alignment of the main values, which supports the development of free thought and profiles of committed and genuine personality. Using creativity as a learning tool and a high perception of commitment help to lay the foundation for good and genuine learners.

Creative and visual thinking suggests that ideas can come from anywhere and everyone is creative. This belief is the foundation of creative thinking, a practice that combines creativity and organization to solve complex problems. Creative thinking helps us foster a culture of innovation (Sternberg, 2003, Zamar et al., 2021).

Hence, people or students develop ideas and test them creatively and effectively. Creative thinking makes us adopt a perspective that reinforces the ability to innovate. The skills that are developed with creative thinking can be applied to different techniques (Awang and Ramly, 2008). Creative and visual thinking allow solving a problem and fostering the creative capacity of a group. To do this, its members must focus on three basic principles: empathy, expansive thinking and experimentation.

Therefore, arts education provides a basic platform for students to generate ideas using critical thinking (Knight, 2010). In this way, students can find support in the visual arts and creativity

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to find novel solutions to their everyday situations or problems, both academic, personal and professional (Reiter-Palmon & Robinson, 2009; González-Zamar & Abad-Segura, 2021b).

3. Methodology.

A systematic review of the literature is proposed, with the aim of identifying and obtaining more information about experiences on visual literacy in Art Education in university contexts.
The use of this work methodology implies the establishment of a detailed and complete plan, in addition to a previous search strategy, to reduce bias by identifying, evaluating and synthesizing all relevant studies on the research topic.
The research approach used to develop the systematic review started from the clear and precise formulation of the mentioned research objective. From there, the use of systematic and reproducible methods made it possible to identify, select and critically evaluate the most relevant research.
An analysis of the scientific literature was carried out from the Scopus database, which contains a wide coverage that reaches almost 25,000 journals published by more than 5000 international publishers and with a coverage of more than two decades. The data collection and analysis of the detected studies were selected using the following keywords: artistic education, art education, visual art, creativity and higher education, taking into account the period from 1990 to 2020. The selected time shows us It will allow to know aspects about visual literacy for artistic education in university contexts. The choice of search fields attends to those with the highest descriptive value within each record and that are more representative, according to the literature review carried out (Abad-Segura, & González-Zamar, 2019).
Regarding the screening of documents, the selection through two steps has been considered. The first consisted of a preliminary review considering the title, abstract and keywords that explicitly mentioned the subject of study interest. The second step considered the meticulous selection of the texts and the preliminary reading of them.
Thus, the review carried out includes a detailed analysis regarding the quality, quantity and consistency of the research results. This methodology is used by the scientific community and is considered one of the best sources for obtaining information on a research topic, because it offers a credible and complete analysis.
Other phases carried out in this systematic review are formulation of the review question, definition of the inclusion and exclusion criteria of the studies, development of a search strategy, search of the studies in databases, selection of studies, data extraction (author / s, year of publication, study design, methodology, results and main conclusions), analysis and interpretation of the results, and dissemination of the results obtained.
Therefore, the final sample included a total of 1834 articles, with a wide variety of variables to be analysed for each record, such as: the year of publication, the journal, the subject area, the author and co-authors of the work, the institutional affiliation of the authors, as well as the country of affiliation and the keywords that define the article. It should be noted that no limits were applied on the language of the document. In addition, documents were included, in addition to scientific research, commercial publications, conference proceedings and book series. Figure 1 shows the flow chart of the selection process of the articles made.

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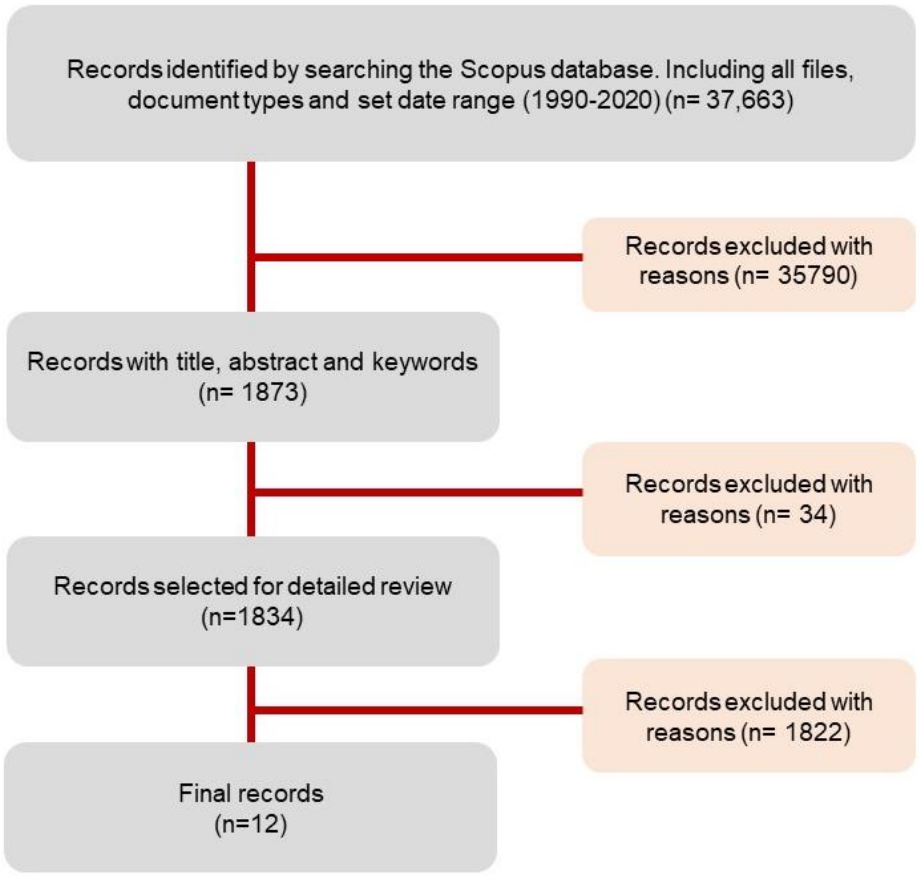

Figure 1. Flow chart of the record selection process. Source: own elaboration.

4. Analysis and discussion.

Figure 2 shows the temporal distribution of scientific production where the flow of publications and the importance or depth that a topic is acquiring in the research is observed. Considering that the analysis of the research considered in this work considers the period from 1990 to 2020, the scientific production has yielded a total of 1834 documents. A growing trend can be seen in the preparation of articles, which begins in 2010 (60 publications; 3.27%). As of 2014, publications practically doubled (112; 6.11%), reaching a total of 268 in 2020.

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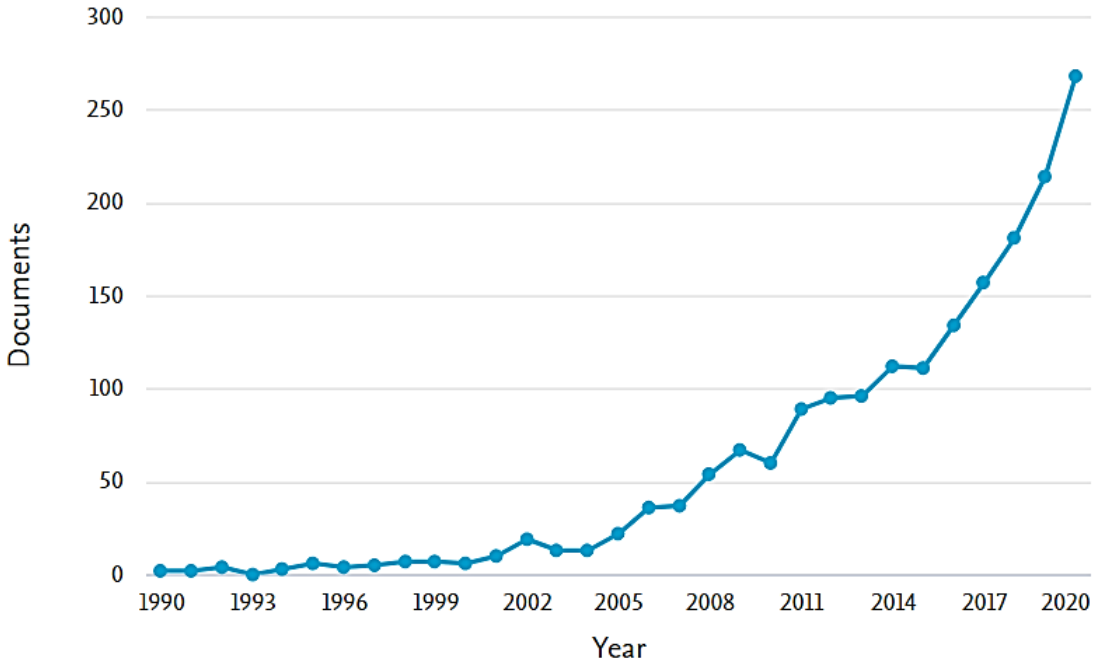

Figure 2. Evolution of scientific production. Source: Scopus.

Figure 3 shows the scientific production by country. The United States, United Kingdom, China, and Australia are the most producing countries, while Malaysia, Brazil, and South Africa are the least producers.

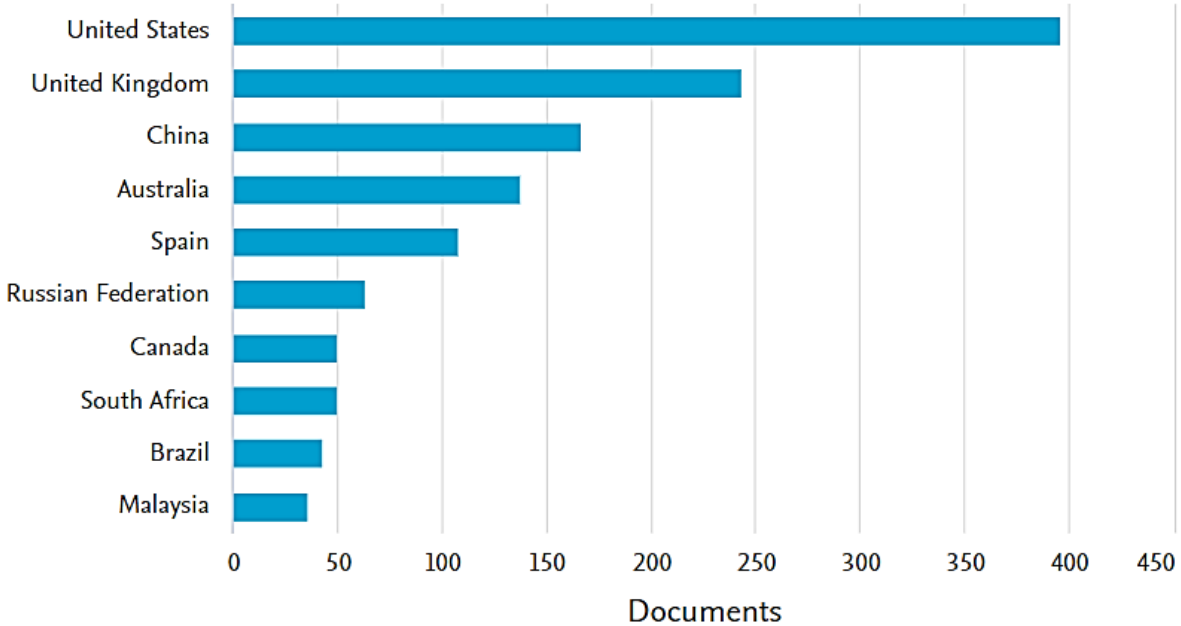

Figure 3. Scientific production by country. Source: Scopus.

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Figure 4 shows the distribution of scientific production by country. United States, United Kingdom, China, and Australia are the most producing countries.

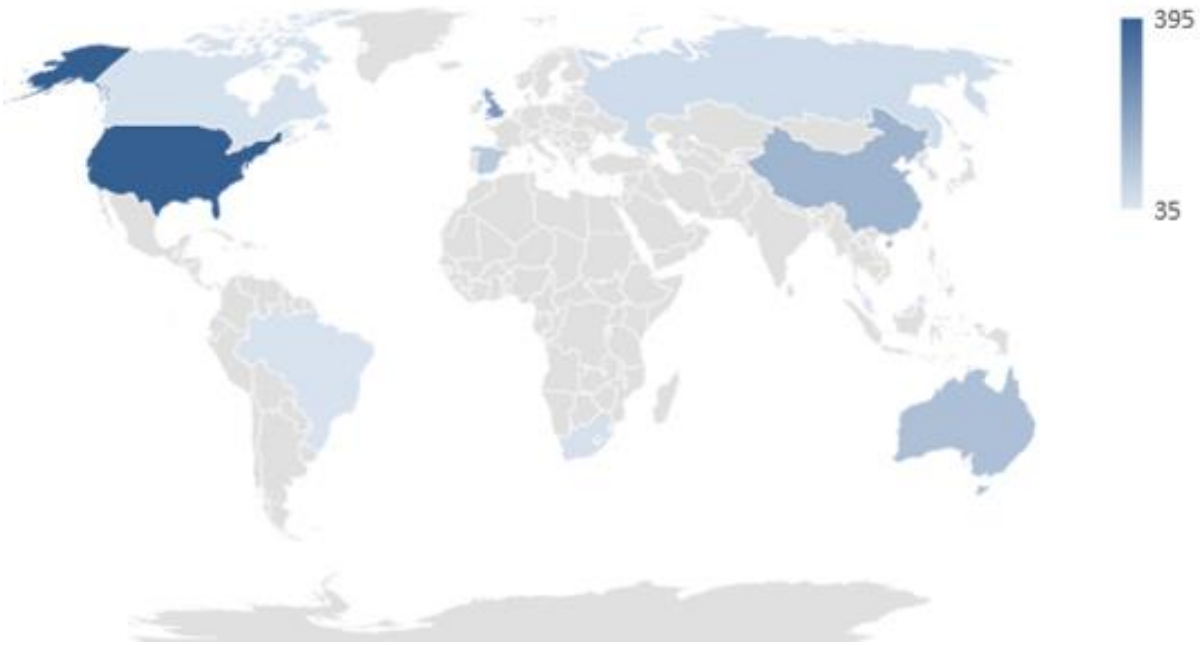

Figure 4. Distribution of scientific production by country. Source: Own elaboration.

Figure 5 presents the types of documents where the publications have been made. In this sense, articles account for 67.4% (1235 articles); It is followed by the conference paper (18%; 331) and the book chapter (5.2%; 95).

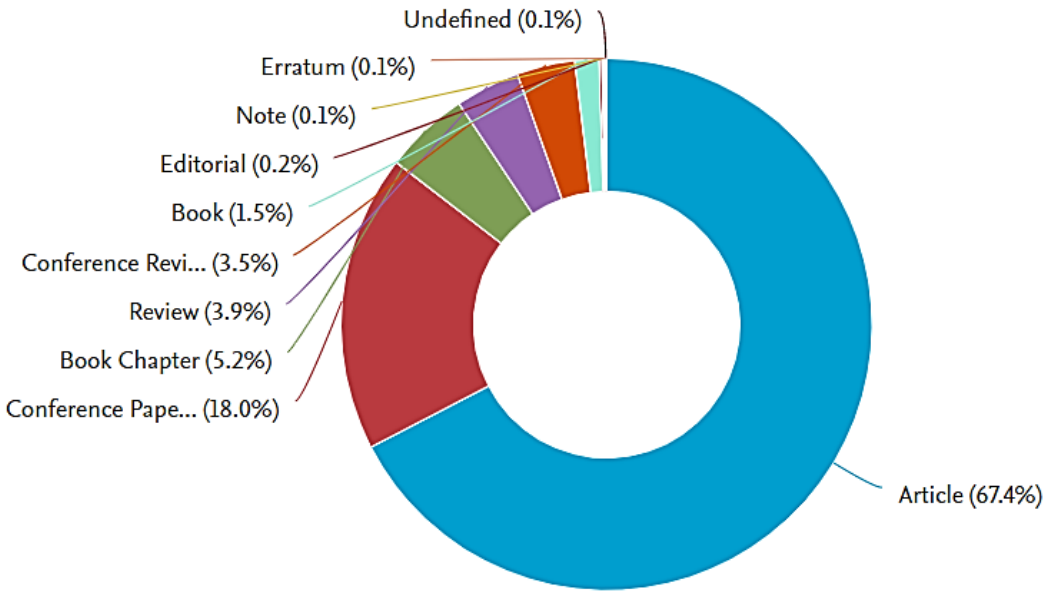

Figure 5. Document type. Source: Scopus.

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Table 1 shows the results obtained in the review of the selected documents on the experiences of visual literacy for artistic education in university contexts.

Table 1. Visual literacy experiences in Art Education in university contexts.

Reference	Article title	Main results and conclusions
Flood, J., & Lapp, D. (1997)	Visual literacy: Broadening conceptualizations of literacy: The visual and communicative arts.	This study describes two hours in the life of an eight-year-old to show that children acquire information and develop language skills from multiple sources. He argues that the conceptualization of literacy must be expanded from reading and writing skills to a definition that recognizes layers of information and includes all forms of the visual and communicative arts.
Eshet, Y. (2004)	Digital literacy: A conceptual framework for survival skills in the digital era.	This study addresses the situation of the Net Generation regarding the use of visual languages and technology. He considers that, although they are used to living online and interacting with technology, their knowledge, understanding, experience and ability to interpret, analyse, evaluate and critically interact with visual and digital images is not automatic and needs to be taught. It is proposed to inquire about the adaptation of the students when interpreting the images they receive.
Bleed, R. (2005)	Visual literacy in higher education.	Today's environment is highly visual: television, websites, videos, and images dominate our lives, and images created with new technologies are changing what it means to be literate. Literacy in the 21st century will increasingly depend not only on text and words, but also on digital images and sounds. This article explores the emergence of visual literacy, which will be as important as text literacy for learning, and the need to integrate it into the curriculum in colleges and universities.
Gibson, R. (2010)	The 'art' of creative teaching: Implications for higher education.	It seeks to link creativity with technological innovation and economic prosperity, starting with Richard Florida's creative class, who argued that universities and colleges should encourage creativity in their students. It is concluded that, in this changing world, the focus should be firm on the development of creativity as an essential ability of young university students.
Sandri, O. J. (2013)	Exploring the role and value of creativity in education	The study defends the importance of creativity in education and argues that innovation is at the heart of the movement of societies towards more creative paths. It is concluded that creativity is an essential part of learning. There are also challenges and rewards that supporting creativity presents for students and teachers.
Arslan, R., & Nalinci, G. Z. (2014)	Development of visual literacy levels scale in higher education.	The objective of this study is to develop a measurement instrument that determines the visual literacy levels of university students. A questionnaire with 75 items was prepared and applied to 3rd and 4th year university students of the Faculty of Education. The tool is considered valid and reliable to help measure the visual literacy levels of college students.
Zhu, C. (2015)	Organisational culture and technology-enhanced innovation in higher education.	The study examines the relationship between organizational culture and professors' perceptions and responses to technology-enhanced innovation among Chinese universities. A research survey was conducted among 684 professors from six universities. Two aspects of technology-enhanced innovation were investigated: the use of e-learning and computer-assisted collaborative learning. The results indicate that the characteristics of the organizational culture are important factors that are associated with the perceptions and responsiveness of teachers to innovation.

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Ervine, M. D. (2016)	Visual literacy in instructional design programs.	This document explores visual literacy, digital native, and the importance of integrating visual literacy into our learning curriculum, especially in instructional design programs. In this technologically advanced environment, users have become highly visual, and where images dominate the learning environment. Literacy can no longer rely solely on text-based materials but must also incorporate digital images and sounds. Higher education appears to be lagging in incorporating visual literacy into its academic programs.
Ghemawat, P. (2017)	Strategies for Higher Education in the Digital Age	Students' perspective on the use of mobile technologies to communicate with their teachers is analysed. It seeks to investigate with what objectives and functions students use technologies and what their expectations are. The results show that applications that allow interpersonal communication as well as publishing and exchange technologies are preferred by students to communicate with their teachers.
Kędra, J.& Zakeviciute, R. (2019)	Visual literacy practices in higher education: what, why and how?	The study investigates the presence of visual education in preschool and early childhood, highlighting that it decreases rapidly in university education, with oral and text instructions dominating. The nature of communication today is extremely visual. although students enter university classrooms, they are thrown into an almost entirely textual world. This highly textual context can cause a misalignment of course material and content. Consequently, contemporary millennial and post-millennial generations, while generally tech-savvy, are often visually illiterate. They do not know how to interpret and evaluate images and how to use them for effective communication.
Williams, W. R. (2019)	Attending to the visual aspects of visual storytelling: using art and design concepts to interpret and compose narratives with images	Education must prepare students to navigate the changing visual landscape. This study investigates a university course in the United States and focuses on the use that students make of the elements of art and design. A content analysis of 124 course documents shows a wide range of art and design elements at work with student visual analyses and original compositions, with many overlapping elements. These results suggest that teaching a wide range of art and design elements can help students acquire a flexible set of tools for reading and composing different types of visual texts, expanding their visual competence.
Vasilenko, S. A., Goltseva, O. S., Belyakova, T. E., Shevalie, K. N., & Vasilenko, E. V. (2020)	Development of Creative Independence of Design Students in Course of Higher Education.	The development of creative independence among design students is a prerequisite for improving the quality of training. It is provided using pedagogical tools to enhance the independent activities of students, contributing to the dissemination of creative potential and the manifestation of individuality, as well as the development of internal motives for educational and creative activities. This study proposes to contribute to the development of professional training in the period of increasing complexity of the requirements for graduates. However, we are aware that not all assigned tasks are solved equally. The issues of adequacy of the proposed system and the study of its application in the context of teaching in a specialized higher integrating institution that combine the disciplines of the humanitarian, general artistic and professional cycles need depth and research.

5. Conclusions and final thoughts.

The objective of this work was to identify and obtain more information about experiences of visual literacy in Art Education in university education. For this, a systematic review of the literature was carried out during the period 1990 to 2020. Research based on the effect of the adoption of visual elements and new technologies and the advantages of incorporating visual practices by educational institutions were studied. higher.

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Accordingly, the key question in this research topic was to identify the importance of both visual literacy in arts education and in a transversal way in the rest of the educational fields, to favour the development of students, both individually and collectively and therefore, from their experiences in Higher Education.

In a digital world, which is increasingly evolving towards the culture of the visual, acquiring this type of learning can be essential. For this reason, both schools and students themselves should be interested in the advantages of mastering visual learning. Among others, highlight the speed with which the human brain processes images, the ease of transmitting complex concepts more quickly and efficiently and the possibility of eliminating language and other barriers, due to the universal nature of images. Visual language, therefore, is a mode of communication that people must connect and transmit ideas, thoughts and emotions.

Along these lines, the present work has tried to reflect on the need to adapt the university educational system to promote the use of graphic organizers or visual methods to transmit information. Therefore, the brain dedicates more than a third of its structure to the analysis of images, relating such connections to the capacity for abstraction and planning.

This indicates that the relationship between visual learning and digital transformation in higher education have connotations related to the creation, innovation and creativity of both the educational community itself as well as society as a whole, attending to a more generalist, multidisciplinary and global.

This study allowed us to reflect on creativity, its development possibilities by making use of active methodologies and the role in innovation processes in the field of university education, culture and art.

Likewise, in addition to the potential for students and teachers in art education, visual literacy research is multidisciplinary, broadening the vision of applications within the environment other areas of knowledge such as architecture, design, mathematics, engineering, advertising, marketing, psychology and languages, and also initial teacher training.

In relation to the forms of teaching and learning through active, open and flexible methodologies, which require greater collaboration and creativity on the part of teachers and students, promote divergent thinking and changes in perspectives, which, in turn, constitute a basis important to the creative process.

The results showed the contributions in this research field, allowing to recognize the main author agents, their research tendencies, and reveal certain critical knowledge gaps. Thus, it can be concluded that trends converge in the incorporation of visual resources in education and research at all educational levels, emphasizing visual approaches that support learning. Today's Internet applications, with multimedia and telecommunications, support the flexible and dynamic representation of knowledge.

This study has some limitations, which could be the basis for future research. Mainly, they come from the intrinsic characteristics of the analysis of the systematic review method. One of these limitations is that it can happen that some papers with high influence in a certain field of research are not detected.

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In addition, this methodology could be extended with other databases or quantitative or qualitative tools, which would facilitate a different perspective of the study. In addition, other types of documents could also be included in the search, in addition to scientific articles.
Finally, it should be noted that among the lines of research that are currently being developed in relation to the subject of the study, these refer, among others, to the application of models that enhance learning using technologies through an approach latent semantic. Likewise, it seeks to promote educational digitization through visual tools and graphic applications that develop visual literacy skills through works of art.

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References.

- Abad-Segura, E., & González-Zamar, M. D. (2019). Effects of financial education and financial literacy on creative entrepreneurship: A worldwide research. *Education Sciences, 9*(3), 238.
- Abad-Segura, E., González-Zamar, M. D., Infante-Moro, J. C. & Ruipérez García, G. (2020). Sustainable Management of Digital Transformation in Higher Education: Global Research Trends. *Sustainability*, *12*(5), 2107.
- Akçayır, M., & Akçayır, G. (2017). Advantages and challenges associated with augmented reality for education: A systematic review of the literature. *Educational Research Review*, *20*, 1-11.
- Arslan, R., & Nalinci, G. Z. (2014). Development of visual literacy levels scale in higher education. *Turkish Online Journal of Educational Technology-TOJET*, *13*(2), 61-70.
- Awang, H., & Ramly, I. (2008). Creative thinking skill approach through problem-based learning: Pedagogy and practice in the engineering classroom. International journal of human and social sciences, *3*(1), 18-23.
- Bleed, R. (2005). Visual literacy in higher education. *Educause Learning Initiative*, *1*(1), 1-11.
- Bowler, L. (2014). Creativity through" maker" experiences and design thinking in the education of librarians. *Knowledge Quest*, *42*(5), 58.
- Buzan, T. (1996). *El libro de los mapas mentales*. Madrid: Urano
- Cheng, M. Y. V. (2019). Developing individual creativity for environmental sustainability: Using an everyday theme in higher education. *Thinking Skills and Creativity, 33*, 100567.
- Christensen, G. L., & Olson, J. C. (2002). Mapping consumers' mental models with ZMET. *Psychology & Marketing*, *19*(6), 477-501.
- Dasli, M. (2019). UNESCO guidelines on intercultural education: a deconstructive reading. *Pedagogy, Culture & Society*, *27*(2), 215-232.
- De Backer, F., Lombaerts, K., De Mette, T., Buffel, T., & Elias, W. (2012). Creativity in artistic education: Introducing artists into primary schools. *International Journal of Art & Design Education, 31*(1), 53-66.

- Eisner, E. (2002). *The arts and the creation of mind.* Yale University Press.
- Ervine, M. D. (2016). Visual literacy in instructional design programs. *Journal of Visual Literacy, 35*(2), 104-113.
- Eshet, Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of educational multimedia and hypermedia*, *13*(1), 93-106.
- Felten, P. (2008). Visual literacy. *Change: The magazine of higher learning, 40*(6), 60-64.
- Flood, J., & Lapp, D. (1997). Visual literacy: Broadening conceptualizations of literacy: The visual and communicative arts. *The Reading Teacher*, *51*(4), 342-344.
- Ghemawat, P. (2017). Strategies for higher education in the digital age. *California Management Review*, *59*(4), 56-78.
- González-Zamar, M.-D., & Abad-Segura, E. (2020). Implications of Virtual Reality in Arts Education: Research Analysis in the Context of Higher Education. *Education Sciences*, *10*(9), 225.
- González-Zamar, M.-D., & Abad-Segura, E. (2021a). Emotional Creativity in Art Education: An Exploratory Analysis and Research Trends. International Journal of Environmental Research and Public Health, *18*(12), 6209. https://doi.org/10.3390/ijerph18126209
- González-Zamar, M.-D., & Abad-Segura, E. (2021b). Visual Arts in the University Educational Ecosystem: Analysis of Schools of Knowledge. Education Sciences, *11*(4), 184. https://doi.org/10.3390/educsci11040184
- González-Zamar, M.-D., & Abad-Segura, E. (2021c). Digital design in artistic education: An overview of research in the university setting. Education Sciences, *11*(4), 144. https://doi.org/10.3390/educsci11040144
- González-Zamar, M.-D., & Abad-Segura, E. (2020). La Realidad Aumentada como recurso creativo en la educación: Una revisión global. Creatividad y sociedad: revista de la Asociación para la Creatividad, *32,* 164-190.
- González-Zamar, M.-D., Abad-Segura, E., Luque de la Rosa, A., & López-Meneses, E. (2020). Digital Education and Artistic-Visual Learning in Flexible University Environments: Research Analysis. *Education Sciences*, *10*(11), 294.
- González-Zamar, M.-D., Abad-Segura, E., Padilla, A. H. M., & García, L. M. (2021). Innovación universitaria y creatividad para la mejora sostenible de ecologías emocionales de aprendizaje. Ediciones Octaedro.
- Grigorenko, E. L. (2019). Creativity: a challenge for contemporary education. *Comparative Education*, 55(1), 116-132.
- Gurung, B. & Rutledge, D. (2014). Digital learners and the overlapping of their personal and educational digital engagement. *Comput. Educ.,* 77, 91–100, https://doi.org/10.1016/j.compedu.2014.04.012
- Hailey, D. (2014). Visual thinking, art, and university teaching across disciplines. *About Campus*, *19*(4), 9-16.
- Hetland, L. (2013). *Studio thinking 2: The real benefits of visual arts education.* Teachers College Press.
- Horton, W. (1993). Visual literacy: Going beyond words in technical communications. *Technical Communication, 40*(3), 495-499.

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- Jeung, H. J., Chandler, P., & Sweller, J. (1997). The role of visual indicators in dual sensory mode instruction. *Educational Psychology*, *17*(3), 329-345.
- Kędra, J., & Zakeviciute, R. (2019). Visual literacy practices in higher education: what, why and how? *Journal of Visual Literacy. 38*. https://doi.org/10.1080/1051144X.2019.1580438
- Knight, L. (2010). Why a child needs a critical eye, and why the art-classroom is central in developing it. *International Journal of Art & Design Education,* 29, 236–243. https:// https://doi.org/10.1111/j.1476-8070.2010.01655.x
- Lee, J. (2018). The effects of knowledge sharing on individual creativity in higher education institutions: socio-technical view. *Administrative Sciences, 8*(2), 21.
- Lewis, S., & Holloway, J. (2019). Datafying the teaching 'profession': Remaking the professional teacher in the image of data. *Cambridge journal of education*, *49*(1), 35-51.
- Lin, H., & Vartanian, O. (2018). A neuroeconomic framework for creative cognition. *Perspectives on Psychological Science*, *13*(6), 655-677.
- Mahlow, C. & Hediger, A. (2019). Digital Transformation in Higher Education—Buzzword or Opportunity? *ELear,* 2019, 13. https://doi.org/10.1145/3329488/3331171
- Matusiak, K. K., Heinbach, C., Harper, A., & Bovee, M. (2019). Visual literacy in practice: Use of images in students' academic work. *College & Research Libraries, 80*(1), 123.
- McCormack, A. J. (2017). Developing visual/spatial thinking in science education. *Science Education*, 143-156. https://doi.org/10.1007/978-94-6300-749-8_11
- Moore, D. M. (1994). *Visual literacy: A spectrum of visual learning*. Educational Technology.
- Phillips, P. M. (2019). The Power of Visual Culture and the Fragility of the Text. *Ancient Manuscripts in Digital Culture*, *3*, 30-49.
- Real Academia Española. (2020). Visualizar en Diccionario de la lengua española (23ª ed.). https://dle.rae.es/visualizar
- Reiter-Palmon, R., & Robinson, E. J. (2009). Problem identification and construction: What do we know, what is the future? *Psychology of Aesthetics, Creativity, and the Arts*, 3(1), 43.
- Rieber, L. P. (1995). A historical review of visualization in human cognition. *Educational technology research and development*, *43*(1), 45-56.
- Scholl, B., & Fitzpatrick, D. (2020). Cortical synaptic architecture supports flexible sensory computations. *Current opinion in neurobiology, 64*, 41-45.
- Seels, B. A. (1994). Visual literacy: The definition problem. *Visual literacy: A spectrum of visual learning*, 97-112.
- Sharp, D. L., Bransford, J. D., Goldman, S. R., Risko, V. J., Kinzer, C. K., & Vye, N. J. (1995). Dynamic visual support for story comprehension and mental model building by young, at-risk children. *Educational Technology Research and Development, 43*(4), 25-42.
- Shrivastava, L. (1983). *Comunicación visual y escuela. Aspectos psicopedagógicos del lenguaje visual.* Barcelona: G. Gilli.
- Sternberg, R. J. (2003). Creative thinking in the classroom. *Scandinavian Journal of Educational Research, 47*(3), 325-338.
- Stopar, K., & Bartol, T. (2019). Digital competences, computer skills and information literacy in secondary education: mapping and visualization of trends and concepts. *Scientometrics, 118*(2), 479-498.

Fecha de recepción: 25-02-2021 Fecha de aceptación: 05-03-2021
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International Journal of Educational Research and Innovation (IJERI), 19, 170-186
ISSN: 2386-4303 DOI https://doi.org/10.46661/ijeri.5735

- Syam, N. & Sharma, A. (2018). Waiting for a sales renaissance in the fourth industrial revolution: Machine learning and artificial intelligence in sales research and practice. *Ind. Mark. Manag*. 69, 35–146. https://doi.org/10.1016/j.indmarman.2017.12.019
- Van Laar, E., van Deursen, A. J., van Dijk, J. A., & de Haan, J. (2020). Determinants of 21st-century skills and 21st-century digital skills for workers: A systematic literature review. *Sage Open*, 10(1). https://doi.org/10.1177/2158244019900176
- Vasilenko, S. A., Goltseva, O. S., Belyakova, T. E., Shevalie, K. N., & Vasilenko, E. V. (2020). Development of Creative Independence of Design Students in Course of Higher Education. *Journal of Educational Psychology-Propositos y Representaciones*, 8. (SPE2), e637 http://dx.doi.org/10.20511/pyr2020.v8nSPE2.637
- Williams, W. R. (2019). Attending to the visual aspects of visual storytelling: using art and design concepts to interpret and compose narratives with images. *Journal of Visual Literacy*, *38*(1-2), 66-82.
- Winner, E. (2007). Visual thinking in arts education: Homage to Rudolf Arnheim. *Psychology of Aesthetics, Creativity, and the Arts*, *1*(1), 25.
- Zhu, C. (2015). Organisational culture and technology-enhanced innovation in higher education. *Technology, Pedagogy and Education*, *24*(1), 65-79.

Fecha de recepción: 25-02-2021 Fecha de aceptación: 05-03-2021
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