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Bibliometric Analysis of the Development of Publications in the Field of Learning Models and Fine Arts in the Form of Books and Articles using VOSviewer

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ABSTRACT

This study examines the development of books and articles in the field of learning models and arts. The goal is to provide analytical data on the development of research publications in the fields of education and the fine arts. The research process uses bibliometric data review methods with VOSviewer detection. The analysis was retrieved based on the data provided by the keywords "learning model" and "art" in the last 5 years from 2018 to 2023, as shown in Publish or Perish. The results of this research show that the development of research on fine arts learning models is developing and always increasing from year to year. The number of publications in the form of books was 133, while the number of articles was 117. If we compare the number of publications in the form of books and articles, there are more books, which shows that publications in the form of books are more popular with researchers than publications in the form of articles.

1. Introduction

Scientific publication is a form of actualization of publishing work in the form of documents, posters, manuscripts, abstracts, and the like, which are scientific or medical in nature [1]. This typically includes validation data, clinical trial results, or any other information related to the licensed product. Publication is an efficient and effective medium for disseminating various empirical experiences in science and technology to society in general and at large [2]. As a result, the publication of more research findings leads to an increase in public awareness. The greater the public's awareness of a published finding, the more knowledge and technology expand. Publications play a crucial role in the advancement of science and technology, which is essential for today's society and the rapidly evolving future. Technology-based learning [3] has also been vigorously advanced,

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especially in the art field. Particularly in the post-pandemic era, increased awareness of technology for virtual classes [4] significantly alters the applied learning model.

A learning model is a framework [5] that provides a systematic description for implementing learning to help students achieve certain goals. This means that the learning model is a general description but still focuses on specific objectives [6]. A learning model is a plan or pattern that is used as a guide in carrying out learning in class or in tutorials [7]. A learning model is a conceptual framework that describes systematic procedures [8] in organising a learning system to achieve certain learning goals and functions as a guide for learning designers and teachers in planning and implementing learning activities [9]. Another opinion explains that a learning model is a design that describes a detailed process of creating an environmental situation that allows learning interactions to occur so that changes or personal development occur in students [10]. Thus, the learning model serves as a conceptual and systematic pattern that guides the implementation of this form of learning.

Fine art is a branch of art that is expressed and created through visual media [11], which, of course, can be seen by the eye and can also be felt through touch [12]. In essence, visual form is the main conductor for this branch of art, rather than sound as in music or body movements in dance. Concrete examples are paintings, sculptures, clothing designs, and handicrafts [13]. But in reality, fine art does not only stop at visual products. There are many types of art media that ultimately combine other media, such as sound and movement in performance art [14]. Then there are also visual products whose material cannot be touched, such as digital paintings displayed on device screens. What is meant by fine art also "changes" when viewed through function, form, style, etc. [15]. Reading images: the grammar of visual design. Routledge. Fine art also continues to develop along with the times [16]. So, works of fine art can be said to be works that are enjoyed by the sense of sight.

VOSviewer was developed by Nees Jan van Eck and Ludo Waltman at Leiden University's Centre for Science and Technology Studies (CWTS) [17]. VOSviewer was originally introduced in a paper published in Scientometrics in 2010. Meanwhile, VOSviewer has been improved and extended in many ways, so the paper is not completely up-to-date anymore [18]. However, it still provides a useful introduction to the main ideas underlying VOSviewer. VOSviewer is useful software for building and visualising bibliometric networks [19]. These bibliometric networks can include journals, researchers, or individual publications, and they can be built based on citations, bibliographic visualisations, co-citations, or relationships between papers [20]. VOSviewer also offers text mining functionality that can be used to build and visualise literacy mapping networks or flows from multiple sources [21,22].

Several researchers have published on learning models and fine arts, including DS Mariyani and Y Wikarya on the Influence of Using Explicit Instruction Models on Student Learning Outcomes in Fine Arts Learning [23]. ML Andhrieansyah and R Hakim discuss the influence of discovery and motivational learning models on fine arts learning outcomes [24]. MT Riyanti on Developing a Learning Model for Planning Project-Based Commercial Graphics Using Dick & Carrey Theory, Faculty of Fine Arts and Design [25], T. Widiyati discusses enhancing learning achievement in fine arts with pure art materials through the application of the Learning by Doing Learning Model [26], while Wikarya focuses on developing fine arts learning modules based on project-based learning models [27]. DY Nilawati, MP Wisdiarman on the Application of Tgt Learning Models Accompanied by Learning Motivation to Improve Fine Arts Learning Outcomes [28], Gülzow, Jörg Marvin, Patrick Paetzold, and Oliver Deussen on Recent Developments Regarding Painting Robots for Research in Automatic Painting [29], Sumarsono, Raden Bambang, Desi Eri Kusumaningrum, Imam Gunawan,

Mutya Alfarina, Muhammad Romady, Nova Syafira Ariyanti, and Erika Mei Budiarti. "Training on the implementation of cooperative learning models as an effort to improve teachers' performance [30].

However, there is still little research on bibliometric analysis in the fields of learning models and fine arts research [31], especially using VOSviewer software as a tool for carrying out mapping analysis [32]. This analysis is important for knowing the development of the number of publications, mapping types of publications in the form of books or articles, and terms that are frequently used and determining the quantity of updates to a term, as well as trends in types of publications.

2. Methodology

The researcher intends to determine the number of publications in the field of learning models and fine arts in the form of books and articles using the bibliometric data review method using VOSviewer detection [33]. This research relies on publications from journals and books [34]. The analysed research publications were retrieved from Google Scholar via the reference management software "Publish or Perish." With the keywords "learning model" and "art," there have been a limit of 1000 publications in the last 5 years, from 2018 to 2023.

Publications that have been collected and comply with the research analysis criteria are then exported into two file types: research information system (.ris) and comma-separated value format (*.csv). VOSviewer can also be used to visualise and evaluate trends using bibliometric maps [35]. The next step involves mapping article and book data from the source database. VOSviewer is used to create three variations of mapping publications: network visualisation, density visualisation, and overlay visualisation based on networks (co-citation) between existing items [36].

3. Results

Based on the results of searching for publication data on learning models and fine arts as follows:

3.1 Number of Publications Per Year from 2018 to 2023

Table 1 shows the number of publications each year. The quantity of publications can be examined through data from the publish or perish reference management programme in the Google Scholar database [37]. The publication statistics for the years 2018, 2019, 2020, 2021, 2022, and 2023 shows a gradual growth in the number of publications. In 2018, there were 26 publications, which ascended to 39 in 2019, 46 in 2020, 55 in 2021, and 75 in 2022. However, there was a reduction in 2023, with just 14 publications. In 2023, there was a decline due to the process in data collection. According to the research findings, the number of publications on learning models and fine arts is at its peak in 2022. Conversely, the number of publications is at its lowest in 2023 due to data collection being conducted in June of that year, leaving six more months for additional publications to be included. There is a potential for an increase if the data is gathered in December 2023. Refer to the table labelled as Table 1 below:

Table 1
Number of publications on learning models and fine arts in 2018-2023

Year	Total
2018	26
2019	39
2020	46
2021	55

3.2 Trend in the Number of Publications from 2018–2023

Figure 1 below shows some trends and patterns that may be derived from the data given regarding the number of articles pertaining to learning models and the fine arts from one year to the next. During this time, there has been a noticeable growth in the number of papers discussing learning models and the arts. From 2018 to 2022, the number of articles rises gradually.

Significant Increase: There has been a significant increase in the number of articles between 2021 and 2022, from 55 to 75. This shows an increase in interest and research focus in the field of fine arts learning models.

There is a decline in 2023: In 2023, there were a total of merely 14 articles reported, indicating a decrease in the quantity of articles. Despite that, it's possible that the data for 2023 only includes the initial months. Hence, the statistics presented may not cover the complete year 2023, which could explain this decrease in numbers.

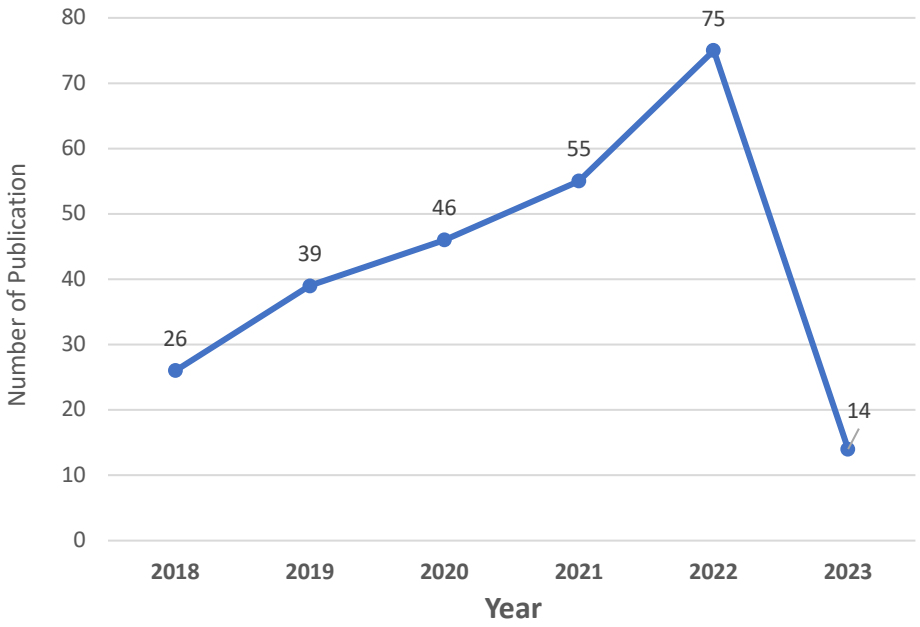

Fig. 1. Development trends in the publication of learning models and fine arts from 2018–2023

3.3 Number of Clusters and Terms

The results of the analysis reveal the cluster mapping and terms used. We found 7 types of clusters and 67 terms, as shown in Figure 2 below:

i. Cluster 1 (11 items): namely, art survey, concept, future, future trend, industry, internet, machine learning, hinge, time, today, world.
ii. Cluster 2 (11 items): namely, art review, art therapy, COVID, disease, effect, jac state, mechanism, patient, person, systematic review, and treatment.
iii. Cluster 3 (10 items): namely data, deep learning, deep learning model, framework, learning model, machine learning mode, model, performance, section, and survey.
iv. Cluster 4 (8 items): namely art, art history, artist, book, history, practice, understanding, and work.
v. Cluster 5 (6 items): namely, future perspective, interest, need, order, recent year, variety.
vi. Cluster 6 (4 items): namely, artificial intelligence, the future, problems, and science.
vii. Cluster 7 (1 item): music.

The mapping results can also determine the relationship between terms in the cluster. The following is an analysis that links each term in the cluster with the keywords "learning model" or "art":

i. Cluster 1 (11 items):
   a. Art survey: related to surveys in fine arts, collecting data or information about fine arts.
   b. Concept: Refers to a concept or idea in fine art.
   c. Future: relating to the future of fine art or future developments.
   d. Future trend: refers to future trends or directions in fine arts or fine arts learning models.
   e. Industry: This is a cluster for the term fine arts industry, which includes the business, production, and marketing of art.
   f. Internet: refers to the influence of the internet on fine art, including digital artwork and online art.
   g. Machine learning: This is a machine learning technique that can be applied in the fine arts, such as pattern recognition or the generation of works of art.
   h. Thing: A fairly general term, possibly related to various aspects of fine art. Time refers to the concept of time in fine art, such as changes in trends or the evolution of art. Today refers to the current state of the art or current context.
   i. World: This is a cluster related to fine arts on a global scale or with cross-cultural influences.
ii. Cluster 2 (11 items):
   Art review is the process of reviewing a work of art, perhaps from a critical perspective. Therapy refers to the use of art as therapy, especially in the context of mental health.
   a. COVID: This is a cluster related to the COVID-19 pandemic and its impact on the fine arts.
   b. Disease refers to a disease or disorder that can be the subject or context in fine art.
   c. Effect refers to the impact or effect of a phenomenon in fine art.
   d. Jac state: This term may refer to a concept or theory in fine art that is unfamiliar or specific.
   e. Mechanism: This is a cluster related to mechanisms or processes in the fine arts, such as techniques or methods.
   f. Patient: refers to patients in the context of art therapy or health.

g. Person: A fairly general term, perhaps relating to personal or individual aspects of fine art.
h. Systematic review: This is a research method that involves a systematic review of a particular topic in the fine arts.
i. Treatment refers to the use of art as part of treatment or therapeutic intervention.

iii. Cluster 3 (10 items):
Data refers to the use or analysis of data in the fine arts, such as quantitative data about art trends.
a. Deep learning: This is a type of machine learning that involves neural networks in the fine arts.
b. Deep learning models: Refers to deep learning models or approaches that can be applied in the fine arts.
c. Framework: Refers to a framework or conceptual structure that can be used in fine art.
d. Learning model: This is a cluster related to learning models in the fine arts, whether theoretical concepts or concrete educational models.
e. Machine learning mode: Refers to the mode or modes of machine learning used in fine arts.
f. Model: The development of models in the fine arts, such as visual or conceptual models, falls under this cluster.
g. Performance: Refers to the appearance or execution of a work of art, whether in the context of performance art or installation art.
h. Section: May refer to a certain part of a work of art or a division in fine art analysis.
i. Survey: This cluster pertains to surveys or research in the fine arts, potentially involving the collection of data or the mapping of art trends.

iv. Cluster 4 (8 items):
a. Art: This cluster pertains to the fine arts as a whole. Art history refers to the history of art, including events, movements, or developments in the fine arts.
b. Artist: Refers to individuals who create or are involved in fine arts.
c. Book: Refers to books related to the fine arts, such as artist monographs or exhibition catalogues.
d. History: The historical aspects of the fine arts are the focus of this cluster. Practice refers to artistic practice, such as creative techniques or methods.
e. Understanding: This is a cluster related to understanding or interpretation in the fine arts. Work refers to the work of art itself, both in physical and conceptual form.

v. Cluster 5 (6 items):
Future perspective refers to a perspective or view of the future of fine arts.
a. Interest: Refers to interest in a topic or aspect of the fine arts.
b. Need: This is a cluster related to needs or interests in the fine arts. Order refers to the order or sequence of events in fine art.
c. Recent year: This is a cluster related to recent years in fine arts. Variety refers to variety, or diversity, in the fine arts.

vi. Cluster 6 (4 items):
Artificial intelligence refers to artificial intelligence and its application in the fine arts. This cluster pertains to the future of the fine arts.
a. Problem: refers to existing problems or challenges. Science refers to the relationship between fine art and science, or a scientific approach to fine art.

vii. Cluster 7 (1 item):
   a. Music: This is a cluster related to musical arts, not specifically fine arts.

Fig. 2. Cluster mapping and terms used in publications on learning models and fine arts

3.4 Network Visualisation Learning Models and Fine Arts

Figure 3 below shows the terms' connected networks as shown in the Network Visualisation Model for Learning and Fine Arts. In terms of network strength, the thickest line represents the word with the strongest network, while progressively thinner lines represent progressively weaker networks. When compared to other concepts, the word "art" stands out with its thickest network line, suggesting a very robust and broad network. Then, beginning with "art review," "model," "deep model learning," "science," "survey," "performance," etc., the networks can be ranked from strongest to weakest.

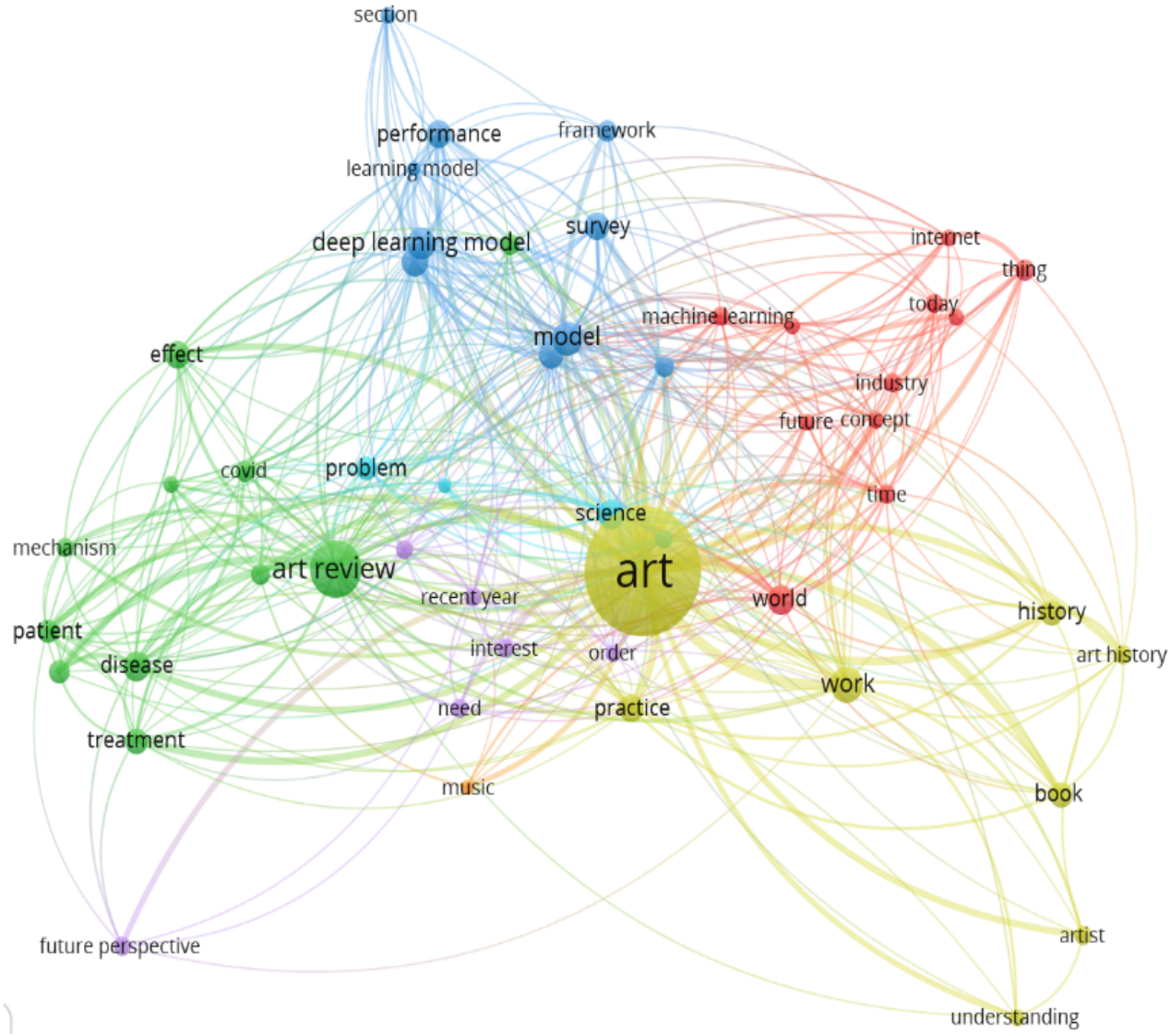

Fig. 3. Network visualisation of learning and fine arts models using VOSviewer

3.5 Cluster Visualisation Learning Model and Fine Arts

Figure 4 below shows that the analysis results obtained from VOSviewer may also be used to create a color-coded map of cluster kinds, making them stand out more. Cluster mapping is also shown, with different colours used for visual representation. Red, green, blue, purple, orange, and yellow are the seven colours that appear to be visible.

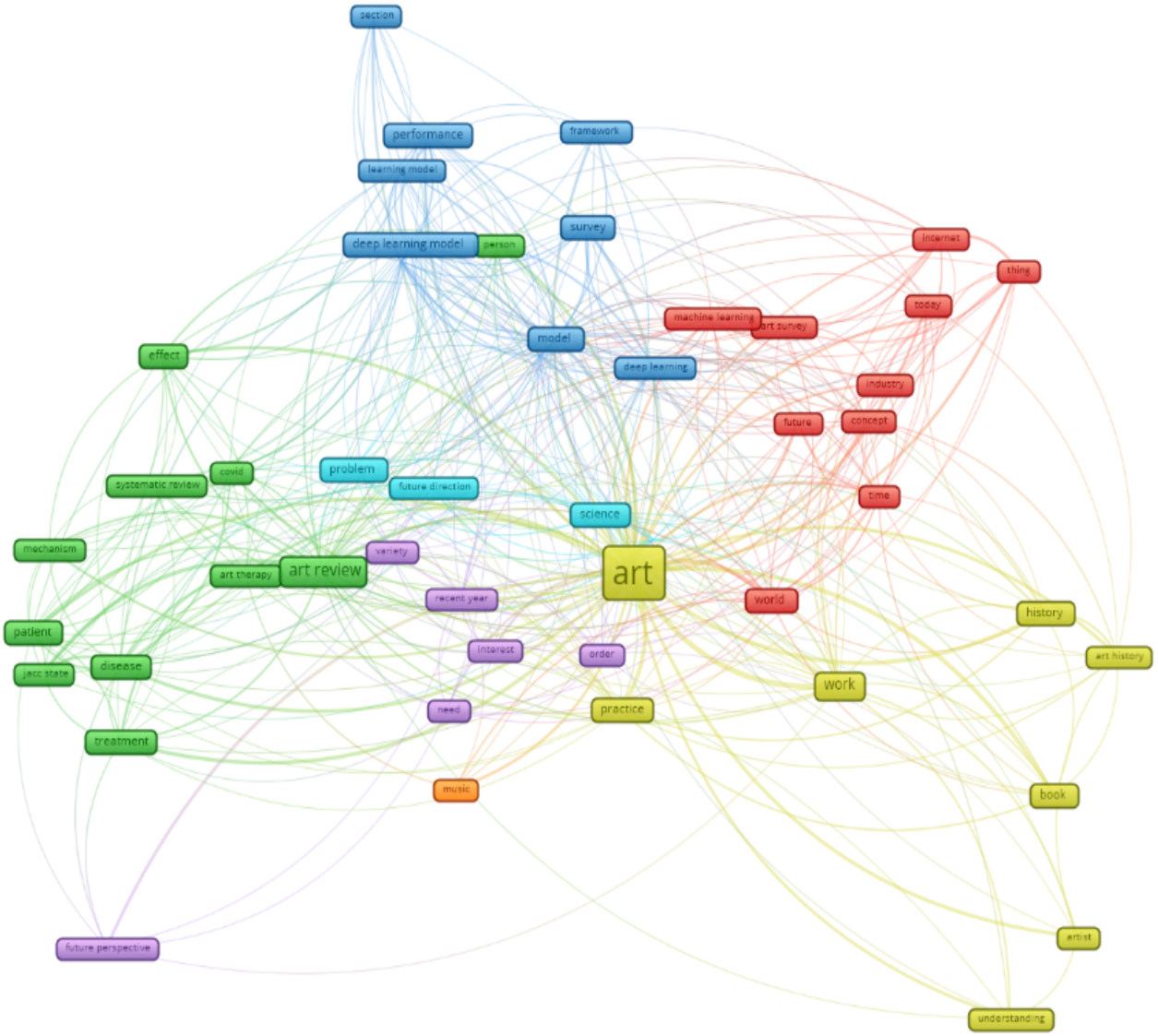

Fig. 4. Cluster visualisation mapping with colour types for learning models and fine arts using VOSviewer

3.6 Cluster Visualization Learning Model and Fine Arts

The network overlay is visualised in Figure 5, using colour intensity and line thickness. Networks are represented by varying line thickness and colour density. The gradient from dark blue to light blue and yellow represents the progression from the most intense colour (dark blue) to light blue, and indicates the degree of correlation between the nuclei. The line with the darkest colour intensity and thickness signifies the highest level of interconnectedness with other terms within the network. The network lines become less prominent as they become thinner, indicating a decrease in the amount of network present. Refer to the diagram labelled as Figure 5 below:

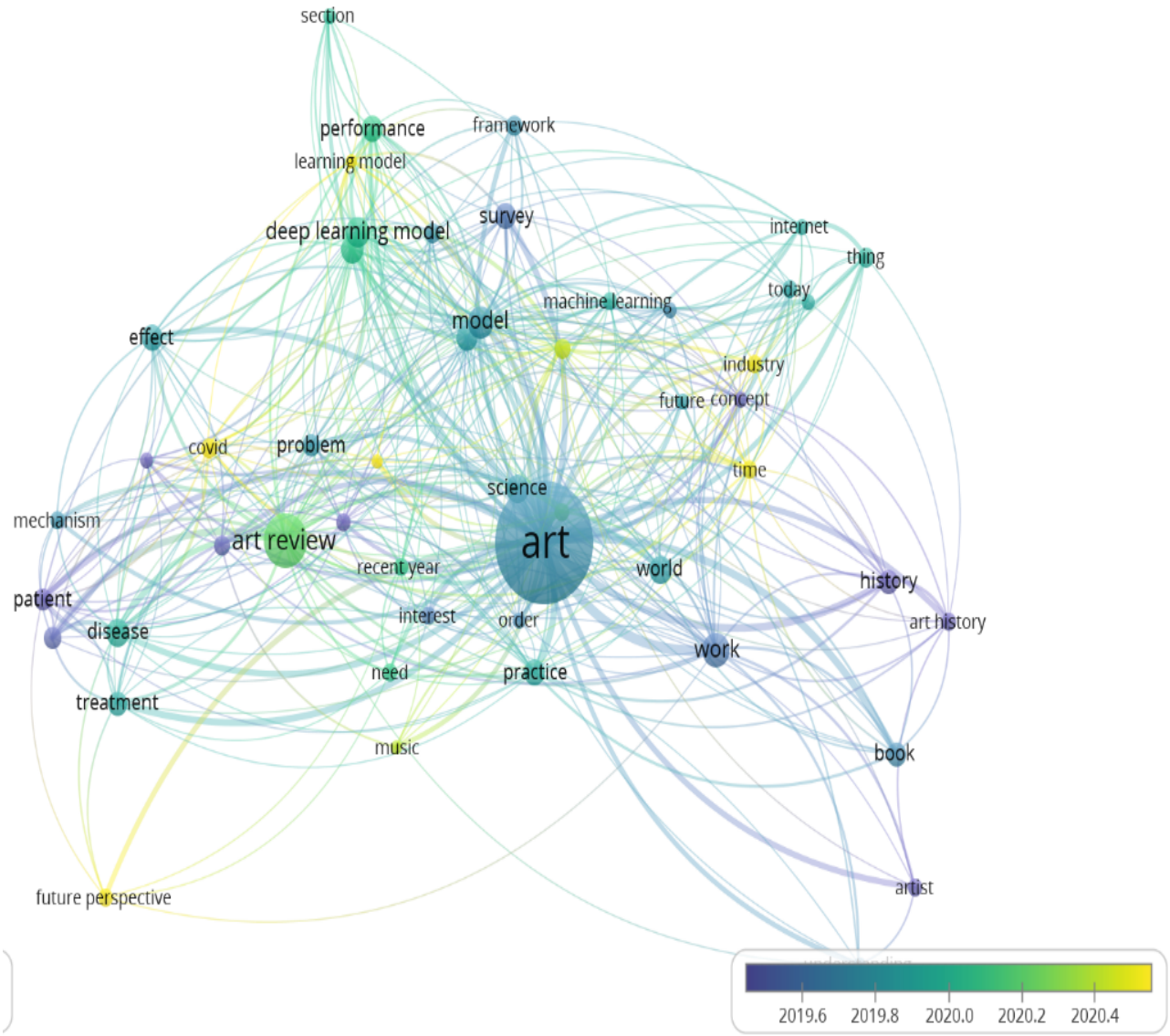

Fig. 5. Network overlay visualisation of learning and fine arts models using VOSviewer

3.7 Density Visualisation Model for Learning and Fine Arts

As shown in Figure 6 below, Density Visualisation Model for Learning and Fine Arts, each term is visualised with a different colour brightness. The brighter the circle, the denser the terms are. And the dimmer the colour the term occupies, the less dense it is.

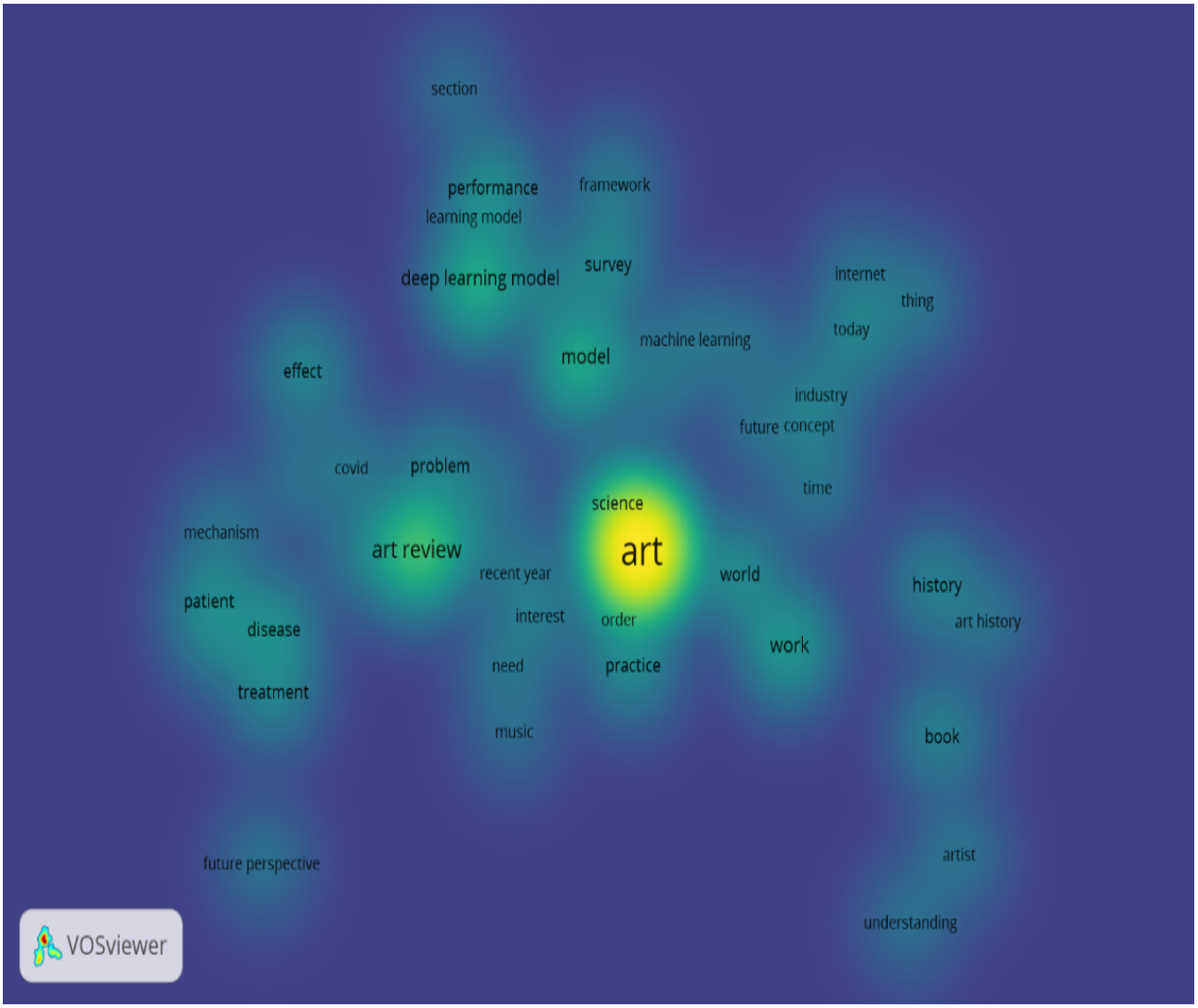

Fig. 6. Density visualisation of learning and fine arts models using VOSviewer

Art is a subject that has been considered a priority in learning and education for around 30 years. It can elevate students' problem-solving and creativity and is often linked to the numerous impacts of discipline and focus that are beneficial in today's world, which is full of distraction. Hence, there are a lot of publications related to art and learning that keep growing year by year.

4. Conclusions

The aim of this research is to provide analytical data on the development of research publications in the fields of learning models and fine arts. After conducting the research, it can be concluded that the development of research on learning models and fine arts from 2018–2023 is developing and always increasing from year to year. The number of publications in the form of books was 133, while there were 117 articles. If we compare the number of publications in the form of books and articles, there are more books, which shows that publications in the form of books are more popular with researchers than publications in the form of articles.

67 terms were found, which were mapped into 7 clusters that were used in writing articles and books about learning models and fine arts. By finding terms in each cluster and describing the terms, it can be used as literacy to increase insight into the meaning of terms related to the fields of learning models and fine arts.

The term "art" has the strongest network compared to other terms, or it can be interpreted that the use of the term "art" is the most widely used in discussions and publications in the form of books and articles.

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