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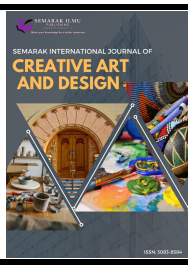

Analysis of Visual Mapping of Evaluation and Assessment of Fine Arts Learning with Bibliometric Method using VOSviewer

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ABSTRACT

Advances in science and technology have had a significant impact on the development of all aspects of life, including education. One component of the education sector is learning evaluation. To determine the development of the field of evaluation and learning, the author conducted a computational mapping analysis research in the field of evaluation and assessment of fine arts learning with bibliometric methods using VOSviewer analysis from 2019-2024. The purpose of this study was to determine the development and trends in the field of evaluation and learning of fine arts. The results showed that the field of evaluation and assessment of fine arts learning can be classified into five clusters. Cluster one was found to have 4 terms, cluster two 4 terms, cluster three 3 terms, cluster four 2 terms, and cluster five 2 terms. The development of articles from 2019 to 2024, the survey found fluctuations and a tendency for increasing research in several studies of evaluation and assessment of fine arts learning (25, 24, 23, 28, 42, and 45 publications per year, respectively). The number of studies decreased from 25 (2019) to 24 (2020), to 23 (2021), but starting in 2022 it increased to 28, in 2023 it increased to 42 and in 2024 it increased to 45. In 2019, 2020, and 2021 there was a decrease due to the impact of the Covid 19 pandemic. Starting in 2022, 2023, and 2024 there was an increase due to the positive impact of the Covid-19 pandemic which began to decline. The benefits of this research can be used as a reference by educators in compiling more systematic evaluations and assessments of fine arts learning for educators and art researchers in designing learning evaluations that are more innovative and relevant to current developments.

1. Introduction

The rapid development of science and technology (IPTEK) has brought significant changes in all aspects of human life in the world, from economics, politics, social, culture, to lifestyle, where digital technology, artificial intelligence, and automation increasingly dominate daily activities. In the field of education, this progress encourages the transformation of the teaching and learning process towards a more interactive, flexible, and technology-based system, such as the use of e-learning, big

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data, and virtual learning environments, which enable broad access to knowledge without the limitations of space and time. These changes not only increase the efficiency and effectiveness of learning, but also demand the adaptation of 21st-century competencies such as creativity, collaboration, communication, and digital literacy so that humans are able to compete in a dynamic global era [1].

Understanding the developments in the influence of science and technology on evaluation and assessment in fine arts learning is crucial for ensuring the quality of the creative process, fairness in measuring learning outcomes, and the relationship between learning objectives and student achievement. However, because fine arts are subjective, multidimensional, and often difficult to measure with traditional tests, research on fine arts evaluation and assessment continues to develop with various approaches, including portfolios, visual rubrics, authentic assessments, and the use of digital technology [2]. To understand these developments comprehensively, bibliometric methods are essential [3]. Bibliometric analysis allows researchers to map research trends; bibliometrics highlight dominant topics in publications related to fine arts evaluation, for example, portfolio-based assessment, digital peer feedback, or the integration of AI in assessment [4]. Thus, teachers, lecturers, and researchers can see the direction of global and regional research developments. Overall, the use of bibliometric methods in studying the development of research on evaluation and assessment of fine arts learning is not only important for academics but also beneficial for art education practitioners who want to develop assessment models that are valid, fair, and in line with the needs of the times.

Reviewing this literature from the period and finding little evidence that previous research examining the Evaluation and Assessment of Fine Arts is presented in Table 1, Research on evaluation and assessment in art education has developed considerably over the past few years, although the focus and methodological scope remain diverse. Bolden *et al*., [5], through a scoping review, explored creativity assessment across multiple disciplines, providing a broad framework for understanding creativity in education. However, their study was not specifically oriented toward visual arts education nor did it employ bibliometric methods. Schneider and Rohmann [6] conducted a systematic review highlighting the cognitive and socio-emotional benefits of arts education, yet their findings revealed heterogeneous outcomes and lacked a direct focus on assessment practices in the visual arts classroom. At the level of assessment instruments, Kárpáti and Paál [7] introduced a visual rubric designed to assess sub-competencies in visual expression. This instrument enhanced transparency of criteria and reliability in evaluation processes, though its applicability remained limited to a single context and did not provide a comprehensive perspective across broader educational settings. Meanwhile, bibliometric mapping has begun to emerge in adjacent domains of visual education. For example, Marín and Cepeda (8] analyzed plastic and visual education using Web of science data, identifying four thematic research lines between 2011–2021. Yet, evaluation and assessment appeared only as a peripheral issue rather than a central focus. Similarly, El-Wakeel et al [9] conducted a bibliometric study on brain-based learning in design and visual arts, which provided insights into actors and trends but did not address assessment mechanisms or ecosystems in visual arts education.

A more practice-oriented perspective is evident in the review by Calderón-Garrido *et al*., [10], who systematically examined the use of digital portfolios in arts education. Their findings indicated that digital portfolios are effective for documenting learning processes and supporting authentic assessment. Nonetheless, challenges related to standardization and validity persisted, and the study did not attempt to map conceptual or scholarly networks in the field. Since 2020, digital assessment practices such as e-portfolios and peer feedback have gained prominence in art education, and recent studies [11,12] Interactive Learning Environments (2024) have underscored the need for

standardized rubrics and transparency in studio-based learning contexts. These contributions, however, remain thematic and instrument-driven rather than offering a computational, large-scale mapping of the field.

Table 1
Previous research on evaluation and assessment of fine arts

Year	Author(s)	Type/Source	Main Findings	Limitations/Gap
2020	Bolden et al.	Scoping review (educ.queensu.ca)	Reviewed creativity assessment across multiple disciplines, providing a broad framework of creativity assessment approaches.	Did not focus on visual arts; not a bibliometric study.
2021	Schneider & Rohmann	Systematic review (Frontiers)	Examined the impact of arts education on cognitive and socio-emotional aspects, demonstrating significant benefits.	Findings were heterogeneous; not specific to visual arts learning assessment.
2022	Kárpáti & Paál	Instrumental study (visual rubric)	Developed a visual rubric to evaluate sub-competencies in visual arts, improving transparency of criteria and reliability.	Limited to a single instrument and context; low generalizability.
2022	Marín-Cepeda	Bibliometric study (ERIC, WoS "plastic & visual education")	Mapped four thematic strands and research trends (2011–2021) in visual education.	Assessment was only one of the issues; no specific bibliometric focus on visual arts assessment.
2023	El-Wakeel et al.	Bibliometric study (PubMed Central)	Mapped research trends and key actors on "brain-based learning" in design and visual arts.	Focused on BBL rather than assessment mechanisms or ecosystems in visual arts.
2023	Calderón-Garrido et al.	Systematic review (SAGE Journals)	Conducted a systematic review of digital portfolios in arts education, highlighting their effectiveness for process documentation and authentic assessment.	Standardization and validity issues remain; did not map bibliometric networks or terms.
2024	Studies on digital feedback and studio-based learning assessment (e.g., IJoTDE 2024; Interactive Learning Environments 2024)	Thematic studies	Demonstrated the need for rubric standardization and transparency in digital-based assessment.	Not bibliometric; thematic focus without mapping assessment-related terms/clusters in visual arts.
2019–2024	(General, global trends)	Review of digital assessment trends (digital portfolios, peer feedback)	Gained momentum since 2020, with growing attention to digital assessment in arts education.	Still thematic/instrument-based; no computational mapping of visual arts assessment.

Taken together, these studies reflect three dominant streams of inquiry: (1) instrument development for assessment in art education, (2) systematic or scoping reviews addressing broader impacts of arts education or specific tools such as digital portfolios, and (3) bibliometric mappings of adjacent educational domains. While valuable, these approaches leave a critical gap: there is currently no bibliometric study dedicated explicitly to the evaluation and assessment of visual arts education. In particular, there is an absence of research that systematically maps terminology, thematic clusters, and networks of scholars shaping the discourse on assessment in visual arts learning between 2019 and 2025. Addressing this gap is crucial to establish a comprehensive understanding of trends, directions, and challenges in the field, while also contributing to the standardization and refinement of assessment practices in visual arts education globally.

The purpose of the research conducted by the researcher was to determine the development and trends in the field of evaluation and assessment of fine arts learning. The results showed that the field of evaluation and assessment of fine arts learning can be classified into five clusters. Cluster one was found to have 4 terms, cluster two 4 terms, cluster three 3 terms, cluster four 2 terms, and cluster five 2 terms. The development of articles from 2019 to 2024, the survey found fluctuations and a tendency for increasing research in several studies of evaluation and assessment of fine arts learning (25, 24, 23, 28, 42, and 45 publications per year, respectively). The number of studies decreased from 25 (2019) to 24 (2020), to 23 (2021), but starting in 2022 it increased to 28, in 2023 it increased to 42 and in 2024 it increased to 45. In 2019, 2020, and 2021 there was a decrease due to the impact of the Covid 19 pandemic. Starting in 2022, 2023, and 2024 there was an increase due to the positive impact of the Covid-19 pandemic which began to decline. The benefits of this research can be used as a reference by educators in compiling more systematic evaluations and assessments of fine arts learning for educators and art researchers in designing learning evaluations that are more innovative and relevant to current developments.

2. Methodology

This study uses a bibliometric approach [13], to analyze publications related to the evaluation and assessment of fine arts learning. The data collection tool uses the Google Scholar application Figure 1. This method allows the collection and analysis of metadata from relevant articles to identify research trends, patterns, and gaps [14]. The VOSviewer software was used to map the relationships between terms and visualization of research clusters [15]. Data will be taken from academic databases such as Google Scholar and Scopus, with keywords: "learning evaluation", "assessment" or "assessment" and "fine art learning" [16]. Publish or Perish to download the article's metadata, including title, author, year of publication, number of citations. Data Search period The articles analyzed are those published in the last 5 years (2019, 2020, 2021, 2022, 2023, and 2024) covering the latest trends in the evaluation of fine arts learning see the following:

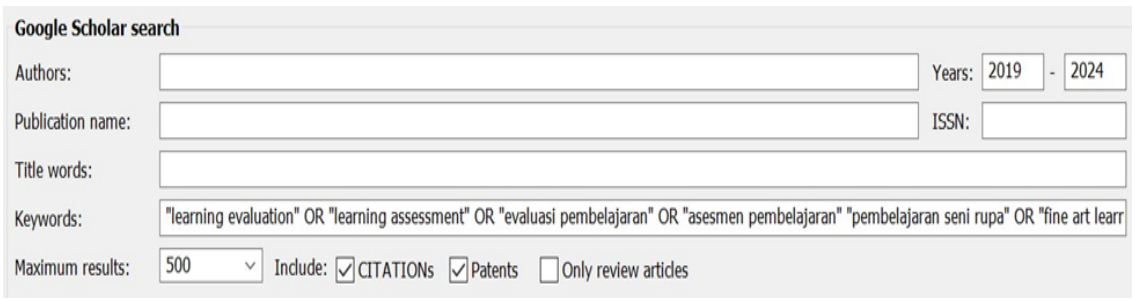
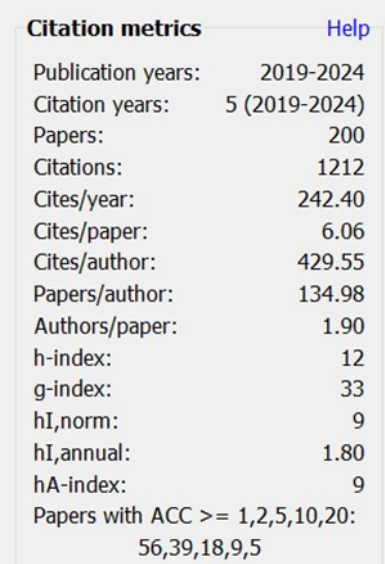


Fig. 1. Application view of article citation search tool

Data analysis through stages; extraction of article metadata in CSV format, data processing using VOSviewer to map interterm relationships, visualization of thematic clusters, term density, and temporal distribution of terms related to the evaluation and assessment of fine arts learning, focus of analysis, and identify dominant themes in the literature of evaluation and assessment of fine arts learning. To find out articles that are of great interest to other researchers through Citation metrics data.



Citation metrics	Help
Publication years:	2019-2024
Citation years:	5 (2019-2024)
Papers:	200
Citations:	1212
Cites/year:	242.40
Cites/paper:	6.06
Cites/author:	429.55
Papers/author:	134.98
Authors/paper:	1.90
h-index:	12
g-index:	33
hI,norm:	9
hI,annual:	1.80
hA-index:	9
Papers with ACC >= 1,2,5,10,20:	56,39,18,9,5

Fig. 2. Citation metrics

3. Result

3.1 Search for Published Article Data and Number of Citations

Table 2 shows the results of data retrieval using Publish or Perish Reference from the Google Scholar database [17], 187 articles were found. The data retrieved was in the form of article metadata consisting of the author's name, title, year of publication, journal name, publisher, number of citations, article links, and URL. Table 1 shows the sample published article data used in the VOSviewer analysis. The sample data consisted of 19 articles. Analyzed from the number of citations from 19 sample articles; The article entitled Comparison of the implementation of the 2013 curriculum and the independent curriculum in elementary schools in Garut Regency, has 598 citations, as the most cited article by the public. This means that the most interesting discussion is about the independent curriculum, because it is most referred to as a reference by researchers and writers, compared to the discussion of cognate topics published in the same period. This shows that between 2019-2024, the most in-demand topic in the academic world is the discussion of the evaluation and assessment of fine arts learning related to the Merdeka curriculum. The article has 598 citations [18].

Table 2
Published articles

Year of Publication	Author Name	Article Title	Number of Citations
2022	A Angga, C Suryana, I Nurwahidah, AH Hernawan...	Comparison of the implementation of the 2013 curriculum and the independent curriculum in primary schools in Garut Regency	598
2021	JHL Koh, RYP Can	Students' use of learning management systems and desired e-learning experiences: Are they ready for next generation digital learning environments?	115
2022	K Kasman, SK Lubis	Teachers' performance evaluation instrument designs in the implementation of the new learning paradigm of the merdeka curriculum	58
2021	I Magdalena, M Mahromiyati, S Nurkamilah	Analysis of test instruments as an evaluation tool in sbdp subjects for grade ii students of sdn duri kosambi 06 am	50
2023	ACK Azis, SK Lubis	Diagnostic Assessment as Learning Assessment in the Independent Curriculum in Elementary School	36
2022	R Risdianty, J Ultimate	Model of Applying Drawing Methods to Increase Creativity in Early Childhood	8
2021	A Sudiyanto, R Mustikasari	Development of Instruments for Measuring the Ability to Perform Fine Arts in Aud	8
2024	D Suprapti, AR Ridho	Diagnostic Assessment as Learning Assessment in the Independent Curriculum at MIN 2 Boyolali	2
2023	TH Retnowati, K Kuswarsantyo, B Prihadi...	Evaluation of the use of e-learning in the implementation of the" Stake's countenance" model in the era of the Covid 19 pandemic	2
2023	PG Sudarsono, IW Artanayasa, NK Widiartini…	DEVELOPMENT OF STUDENT PERFORMANCE ASSESSMENT INSTRUMENTS BASED ON PANCASILA STUDENT PROFILES IN THE ART PRACTICUM ...	1
2019	B Prihadi, D Wulandari…	Quality of Instruments for Assessing Summative Learning Outcomes of Fine Arts at Junior High School in Sleman Regency	1
2021	L Adi, T Triyanto, MI Syarif...	Authentic Assessment In Learning Ornamental Variety Based On Coastal Eco-Culture During The Pandemic Covid-19	1
2021	I Syria	Assessment of Cultural Arts Learning (Performing Dance) in Grade XI Mia 1 Students at SMA Negeri 1 Stimulus for the 2020/2021 Academic Year	1
2024	S Nofiana, S Zulaiha, J Kumara Dewi	Application of Free Expression Method in Improving Learning Outcomes of Drawing Skills of Grade IV Students of SDN 20 Rejang Lebong	1
2019	S FARIDAH	THE IMPLEMENTATION OF PORTFOLIO BASED ASSESSMENT ON FINE ARTS SUBJECT AT SMA NEGERI 1 BANTAENG IN BANTAENG DISTRICT	0
2024	AS Nazilah, F Ferdianto	DIAGNOSTIC ASSESSMENT IN DIFFERENTIATED LEARNING: SUPPORTING STUDENTS'NEEDS FOR ENHANCED LEARNING	0
2024	ACK Azis, S Sugito, G Kartono...	Development of Teaching Materials for Dual Visual Work Assessment Parameters: P-Books and E-Books in the Department of Fine Arts	0
2023	R Pakasi	Measurement and Evaluation of Art Teaching	0
2024	B Syavira, M Mansurdin	IMPROVING FINE ARTS LEARNING OUTCOMES BY CREATING ARTWORKS FROM WASTE PAPER USING A PROJECT-BASED MODEL ...	0
2024	AH Wijaya	Implementation of Differentiated Learning and Assessment in the Subject of Islamic Cultural History Class VII at Mts Syekh Subakir 1 Nglegok Blitar 2023 ...	0

2024	N Abdillah	Diagnostic Assessment in the Implementation of the Independent Curriculum at Madrasah Ibtida'iyah Walisongo Kranji 01, Kedungwuni District, Pekalongan Regency	0

Table 3 shows that in 2022 it recorded the highest number of citations (664 citations) despite only 3 articles. This suggests there are one or two articles that are highly influential academically. Articles by A. Angga et al. (598 citations) are the largest contributors. The topic of the comparison of the 2013 curriculum and independence seems to be a big concern in the world of education. There is also a large disparity in the number of citations between articles: only a few articles get a lot of citations, while most others only get 0–2 citations. Of the 19 articles, 10 (52.6%) had 0–1citations, indicating a possible lack of exposure, relevance, or were still too recent to cite [19].

Table 3
Recapitulation of the number of citations per year

Year	Number of Articles	Total Citations	Average Citations per Article
2019	2	1	0,5
2020	0	0	-
2021	5	175	35
2022	3	664	221,3
2023	4	39	9,75
2024	6	4	0,67

Figure 3 shows a downward trend in 2024, although there is an increase in the number of articles in 2024 (6 articles), the number of citations is very low (only 4 in total). This can be caused by: The article is still new and has not been cited much, the topic or journal has not been widely reached by the academic community, it takes time for the article to gain the influence of citations. Articles with high citations mostly discuss the independent curriculum, assessment, and educational evaluation. Issues about e-learning and digital learning environments also stand out, such as the article Joyce and Rebecca Yen [20], with 115 citations. Longer articles tend to have a higher number of citations, according to bibliometric logic: the longer the publication time, the greater the chance of citation [21].

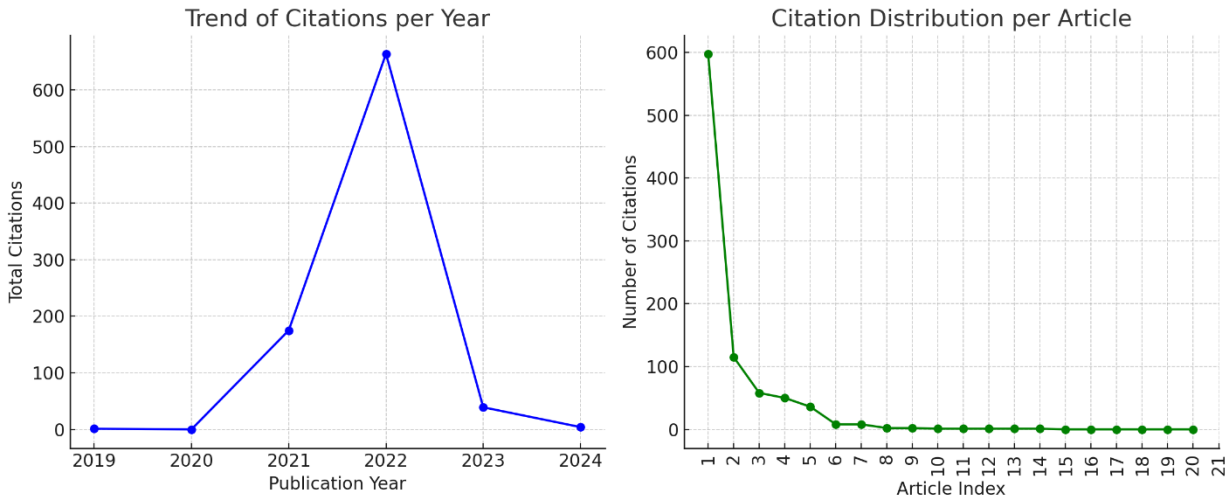


Fig. 3. Citation trends per year (left) and citation distribution per article (right)

3.2. Research Developments Related to Evaluation and Assessment of Fine Arts Learning

Table 4 shows the number of articles in 2019, 2020, 2021, the number of articles (25, 24, 23) decreased. This is possible due to the impact of Covid 19, so that almost every country in the world implements lockdown down, which limits human activities. This policy restricts the activities of researchers and academics for access to laboratories, seminars, discussions, academic conferences, and other academic activities. The impact of COVID-19 is also very extraordinary on the mental state of humans becoming fearful, anxious and troubling, feeling afraid of contracting it if it comes into direct contact with exposed humans, because the outbreak will be transmitted due to direct contact [44]. As a result, researchers and academics are overwhelmed in research activities and publication of scientific articles.

From 2021 to 2022, the number of articles from 23 to 28 began to increase. This is because the Covid 19 outbreak began to recede, so that post-COVID 19 activity activities began to rise, so that the activities of researchers and academics began to be enthusiastic again in researching, writing, and publishing articles [45].

A big jump occurred from 2022 to 2023, the number of articles went from 28 to 42. This is because the COVID 19 outbreak is almost over, so that activities in research and article publication grow and develop very rapidly. The addition continues to the following year from 2023 to 42, in 2024 to 45 articles, so that starting from 2021-2024 the development of articles discussing the evaluation and assessment of fine arts learning is always increasing.

Table 4
Development of research, evaluation, and assessment of fine arts learning from 2019-2024.

Year	Number of Publications
2019	25
2020	24
2021	23
2022	28
2023	42
2024	45
Sum	**187**

Figure 4 shows the trend of article development from 2019-2024 fluctuating but steadily increasing. In 2019–2021, there was a gradual decline, the number of articles decreased from 25 (2019) to 24 (2020), and the decline continued in 2021 (23). But starting from 2022, 2023, and 2024 it will always increase. The highest peak of the increase in the development of articles discussing the evaluation and assessment of fine arts learning occurred between 2023-2024.

The factors causing the development trend in addition to the release of the impact of COVID 19, are also influenced by the development of digital technology science, so that the development of the field of evaluation and assessment in the field of fine art based on digital technology is increasing, this affects the development and exploration in research, writing, and publishing articles [46].

The increase in collaboration between educational institutions and journal publishing at the national, regional, and global levels also affects the rapid growth and development of research articles [47].

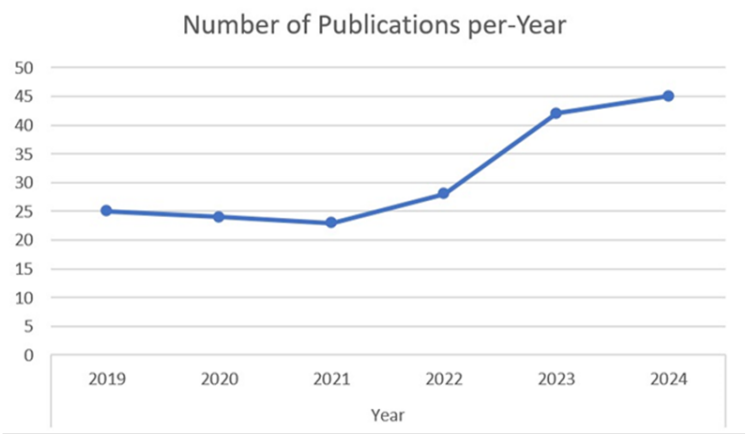


Fig. 4. Article development trend chart

3.3 Article Cluster on Evaluation and Assessment of Fine Arts Learning

Visualize the topic area of fine arts learning evaluation and assessment using VOSviewer for computational mapping. 15 elements were found from the results of the computational mapping. Each item related to the evaluation and assessment of fine arts learning in data mapping falls into one of its five groups:

Figigur 5 shows an overview of the number of clusters and the number of terms:

i. Cluster 1 (4 item): assessment, diagnostic assessment, Merdeka curriculum, study.
ii. Klaster 2 (4 item): application, cultural art, implementation.
iii. Cluster 3 (3 items): evaluation, fine art learning, painting.
iv. Cluster 4 (2 items): influence, student.
v. Cluster 5 (2 items): learning, development.

Cluster 1 (4 items): assessment, diagnostic assessment, Merdeka curriculum, study, all terms in this cluster are centered on the assessment process in the context of the Merdeka Curriculum: from authentic approaches, diagnostics, to empirical studies [48,49]. Cluster 2 (4 items): application, cultural art, implementation which focuses on the application of the Independent Curriculum in learning art and culture (cultural art) and its application in the field. [50]. Cluster 3 (3 items): evaluation, fine art learning, painting, highlighting aspects of the evaluation of fine arts learning, especially painting, in the context of the Independent Curriculum [51]. Cluster 4 (2 items): influence, student refers to the influence of learning on learning outcomes or engagement students [52]. Cluster 5 (2 items): learning, development, describing the concept of learning development in general, especially in the realm of art and culture [53].

Fig. 5 Number of clusters

3.4 Visualization of the Distribution and Density of Fine Arts Learning Evaluation and Assessment Research

3.4.1 Overlay Visualization (term distribution per year)

Painting" and “fine art learning” tend to be blue, meaning that it is more dominant to appear at the beginning of the period, around 2019–2020. Term “learning”, "student"and “assessment” Green The 5-color picture shows the year the term appeared, while The color gradation indicates the time of the appearance of the term. Dark blue: the term appeared more often in the early years (2019–2020). Green: emerges and develops in the middle year (2021–2022). Bright yellow: a popular or emerging term in the current year (2023–2024) [54].

Term “diagnostic assessment” and "study" yellow means popular or widely discussed in 2023–2024, "The Art of means stable appearing in the middle of the period (2021–2022) [55].

Size and Connection Between Terms; The size of a term box reflects the frequency or strength of its occurrence in the document. A connecting line indicates the relationship or relationship between keywords based on a common occurrence (co-occurrence). Term “learning” Strongly connected with "student", “assessment”, “implementation”and “evaluation”[56].

Newer terms (yellow) indicate recent trends in research, e.g. related to Merdeka Curriculum and diagnostic assessment. Old (dark blue) terms such as Painting or fine art learning reflects the initial focus in the study of fine arts. Central terms such as learning and assessment indicates a major topic that continues throughout the year [57].

This Visualization Overlay shows that the topic about Merdeka curriculum and diagnostic assessment began to emerge in recent years. Themes like fine art learning and Painting more predominantly discussed at the beginning of the period, the topic learning, Student and assessment remained the center of attention from the beginning to the end of the research period.

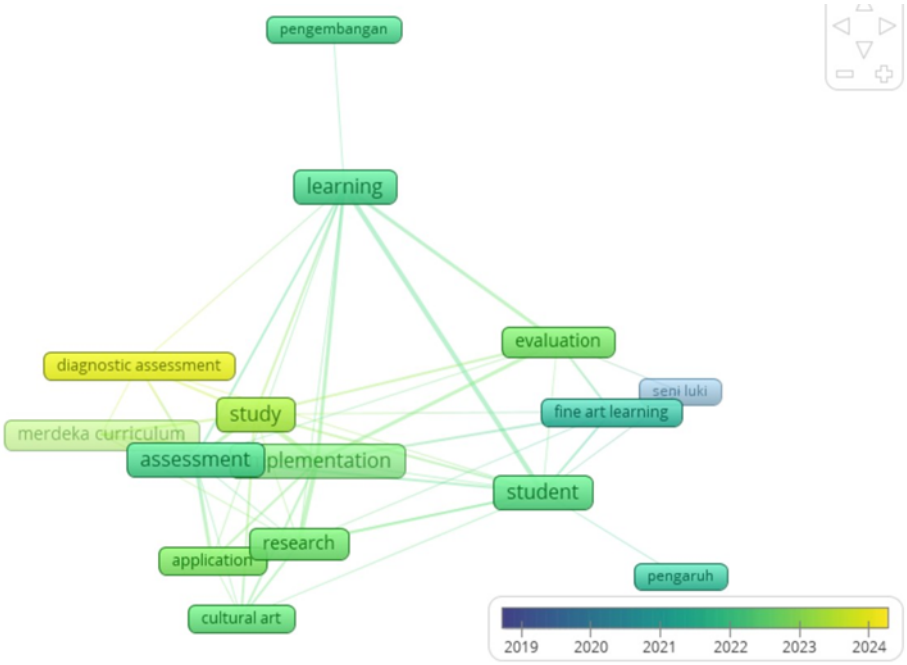


Fig. 6. Overlay visualization (term distribution in each year)

3.4.2 Density Visualization

Figure 7 shows Density Visualization which displays the density of term occurrence and semantic proximity between terms in the form of color clusters and light size. The lighter and larger the area of color, the more often the term appears and correlates with other terms around it. Red Cluster: Focus on Assessment & Curriculum Includes: assessment, diagnostic assessment, Merdeka curriculum, study. That is: the most dense and closely discussed the formative evaluation and implementation of the Independent Curriculum. Shows the main trends of research in the area of education assessment. Green Cluster: Applications and Cultural Contexts including: application, cultural art, research. Demonstrate a focus on the implementation of arts education in the context of culture and application research. Blue Cluster: Evaluation in Fine Arts Learning, including: evaluation, fine art learning, Painting, which leads to the focus of evaluation of the art teaching and learning process [58].

Yellow Cluster: Student Factors and Influences, including: student, influence.
Focus on research related to the impact of art learning on students or the role of students in the art learning system. Purple Cluster: Learning and Development, including: learning, development [59]. This isolation of cluster positions suggests that the general concepts of learning and development are often mentioned but less directly related to more specific clusters.

Density and Color: Areas with high color intensity (e.g. red clusters) indicate that these terms very often appear together in various articles or documents. Distance Between Clusters: The distance between color groups indicates the degree of semantic relationship between terms. For example, the red and green clusters are very close, meaning there is a strong relationship between assessment and implementation/application in the field. Isolated Position (e.g. purple): Indicates a theme that is important but less directly related to other themes empirically in the dataset [60].

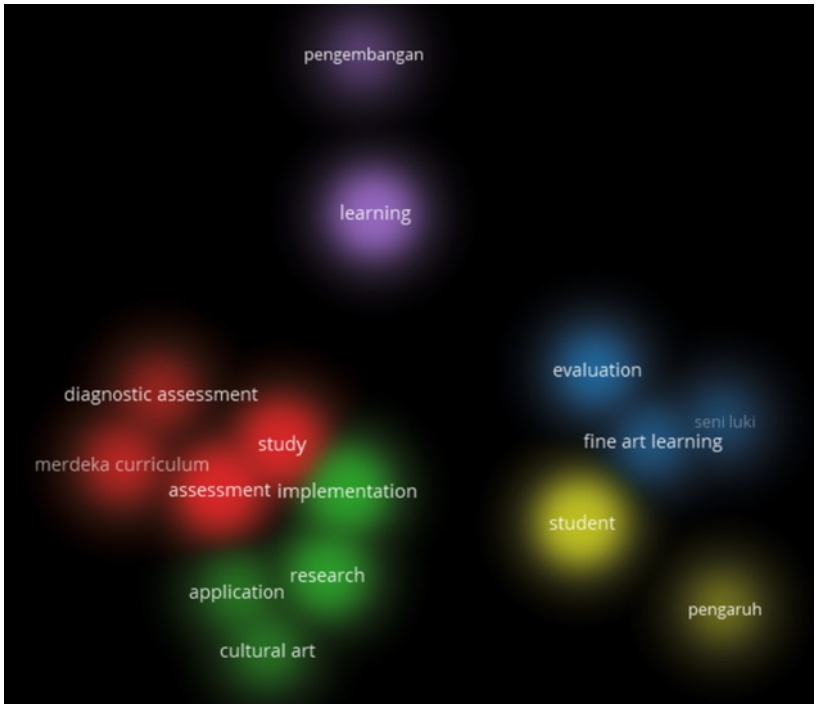


Fig. 7. Density visualization

3.4.3 Relationships between terms and the power of connections (Network visualization (connection between all terms)

The visualization in Figure 8 is a network visualization that describes the relationship between concepts or keywords that often appear together in the corpus of articles, such as in the study of evaluation, art learning, and curriculum implementation [61]. Node: Represents important terms/keywords (e.g. assessment, learning, student, fine art learning). Different colors denote different thematic clusters. Red: Focus on assessment and diagnostic assessment. Green: Focus on implementation, application, and research. Purple: Focus on learning and development. Yellow: Relating to students and influences. Blue: Focus on evaluation, fine art learning, and painting [62]. Edge: Indicates the relationship or relationship between terms that often appear together. The thicker or darker the line, the stronger the connection between the two terms [63]. Connection Center: Learning is central to many connections, showing that this term is very central and relevant to all clusters. Assessment is also an important link between the Merdeka curriculum cluster, diagnostic assessment, and implementation. Cluster Structure: There is a fairly clear separation of topics between the themes of evaluation and assessment, cultural implementation and application, and learning and influence on students [64]. This visualization is very useful in identifying research focuses and thematic linkages in the current literature, especially those related to fine arts learning, evaluation, and the Merdeka curriculum. It can be used to find research gaps or research trend directions.

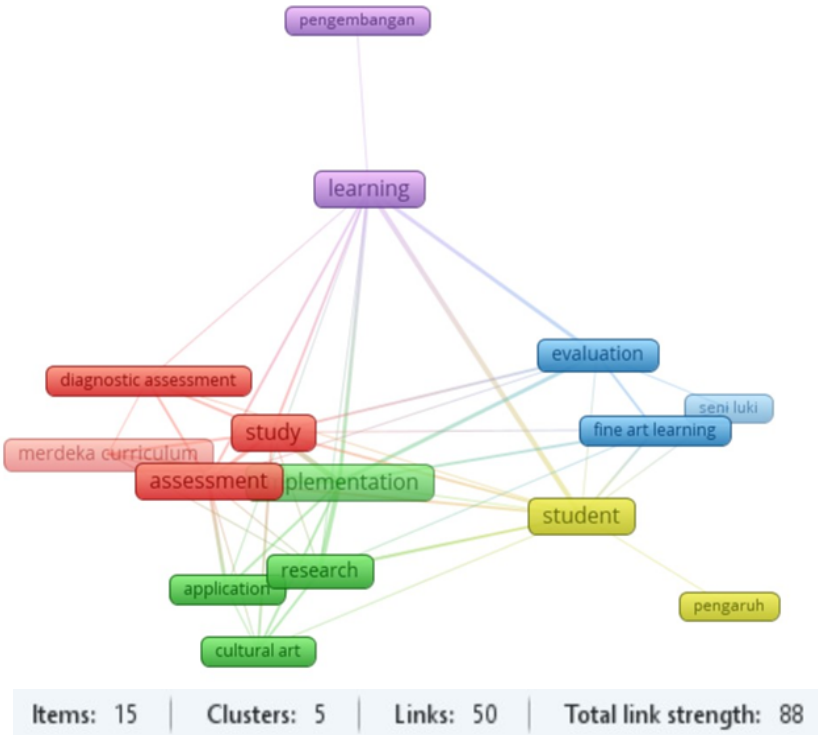


Fig. 8. Network visualization (connection between all terms)

3.4.4 Visualization of the relationship between terms and the strength of the connection

Relationship between terms and connection strength Network visualization Figure 8 illustrates the relationship between terms in the set of scientific articles analyzed. Each node (colorful box) represents an important term, and the border indicates the relationship or co-existence between terms in the same document. the meaning of the relationship between terms; The more edges that connect a term to another, the more important or central the term is in the context of the research. "Learning" is central (purple): This indicates that the term appears very often alongside other terms such as assessment, evaluation, student, research, and implementation [65]. "Assessment" and "Study" (red): indicate research clusters that focus on assessments and studies related to the Merdeka curriculum. "Implementation", "Application", and "Cultural Art" (green): form a cluster of terms that focus on implementation and application in the context of art and education [66]. "Student" and "Influence" (yellow): indicate a focus on the impact of learning on students [67]. "Evaluation" and "Fine Art Learning" (blue): emphasizing evaluation in the context of fine arts learning [68]. Strength of Connection.The thickness or number of connections between two terms indicates the frequency of co-existence in the document: For example, the connection between "Learning" and "Assessment" is very clear and numerous, signaling a strong relationship in the literature. The relationship between "Influence" and "Student" is thinner, indicating a lower frequency.

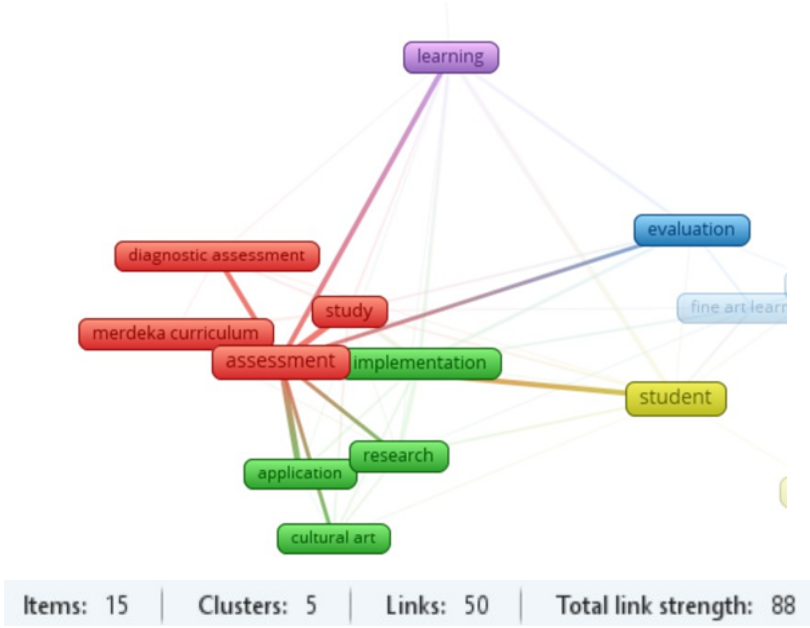


Fig. 9. Visualize the relationship between terms and the strength of the connection

3.4.5 Connections on terms with the largest network in clater 1

Figure 10 shows a network visualization showing the semantic relationships between terms in the context of evaluation and art learning. The red cluster is the largest network, with assessment as the central node that has the strongest connection to various other terms such as diagnostic assessment, independent curriculum, study, and implementation [69]. This shows that the term assessment is a dominant topic that is widely researched and has a close relationship with other topics. Visualization Meaning: Red nodes: Indicates a group of terms with high similarity that belong to the assessment domain. Node size: The larger the node, the more often the term appears [70]. Edge thickness: Indicates the strength of semantic relationships/connections. A strong mutual connection is seen between assessment and study, with diagnostic assessment. Central position of "assessment": Indicates its important role in bridging terms from other clusters such as implementation, student, and evaluation.

Fig. 10. Connections on terms with the largest network in clater 1

3.4.6 Connections on terms with the largest network in clater 2

Figure 11 shows that the image shown is a network visualization that illustrates the semantic relationship between key terms in learning studies, assessments, curriculum, and art [71]. This visualization consists of several color clusters that reflect the interconnected groups of topics, as well as the thickness of the lines that show the co-occurrence of the connections between terms [72]. Central Node: "Learning; The term "learning" (purple) serves as a hub in the network [73]. Have strong connections to various clusters such as; Assessment (red), Implementation and Research (green), [74]. Evaluation and Student (blue and yellow) [75], and Development (purple/light purple). This shows that the concept of learning is the meeting point of various educational approaches, both curriculum, assessment, and implementation in the field. Red Cluster: Assessment and Curriculum. Consists of the terms: Assessment, Diagnostic assessment, Study, and Independent Curriculum. This cluster emphasizes initial evaluation, new curriculum approaches (such as Merdeka), and assessment-related studies. The thick lines between the terms show the strong connection between terminological and conceptual in the literature review. The Green Cluster shows an orientation to field practice and applicable research results. Direct connection to "learning" indicates that learning is greatly influenced by how policies or curriculum are implemented and researched. Blue and Yellow Clusters: Evaluation and Learners and Evaluation are connected to "learning", emphasizing the importance of assessing learning outcomes and student engagement as the main subjects of learning. Light Purple Clusters: Development. Development is a stand-alone term but is directly connected to "learning", describing the strategic dimension of educational innovation. This visualization shows that "learning" is a central concept that bridges various important themes such as assessment, curriculum, learning implementation, evaluation, and innovation. A holistic approach is needed for these connections to produce an effective and relevant learning ecosystem, especially in the context of the Merdeka curriculum and art learning.

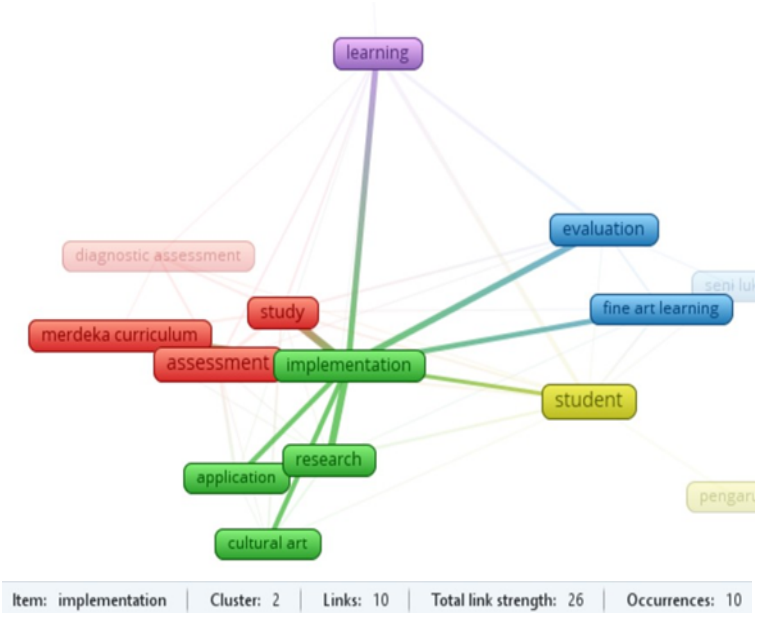


Fig. 11. Connections on terms with the largest network in clater 2

3.4.7 Connections on terms with the largest network in clater 3

Figure 12 shows that based on the visualization of the term connections above, cluster 3 is marked in blue and consists of the terms Evaluation and Fine art learning, appearing to have a weak connection to "painting". The term "evaluation" indicates a strong connection to "implementation" and "student", as well as a connection to "learning". This shows that the evaluation process in the context of fine arts learning does not stand alone, but is highly integrated in the implementation of learning and student involvement [76]. Meanwhile, the term "fine art learning" has a connection to terms that reflect learning practices or methods, suggesting that fine art learning is influenced by emerging evaluation approaches, both in the context of the curriculum and in classroom application [77]. This cluster reflects the central role of evaluation in fine arts education, particularly in the context of learning that focuses on understanding, creative expression, and aesthetic learning outcomes. Evaluation is not just a final assessment, but rather a part of instructional design and reflective learning in the fine arts. Fine art learning also has a strategic role in competency-based education because it involves cognitive, affective, and psychomotor skills. In this context, evaluation is formative and summative, supporting the development of critical thinking and appreciation of students' art [78].

The term "evaluation" indicates a strong connection to "implementation" and "student", as well as a connection to "learning". This shows that the evaluation process in the context of fine arts learning does not stand alone, but is highly integrated in the implementation of learning and student involvement. Meanwhile, the term "fine art learning" has a connection to terms that reflect learning practices or methods, suggesting that fine art learning is influenced by emerging evaluation approaches, both in the context of the curriculum and in classroom application. [79]. This cluster reflects the central role of evaluation in fine arts education, particularly in the context of learning that focuses on understanding, creative expression, and aesthetic learning outcomes. Evaluation is not just a final assessment, but rather a part of instructional design and reflective learning in the fine arts. Fine art learning also has a strategic role in competency-based education because it involves cognitive, affective, and psychomotor skills. In this context, evaluation is formative and summative, supporting the development of critical thinking and appreciation of students' art [80].

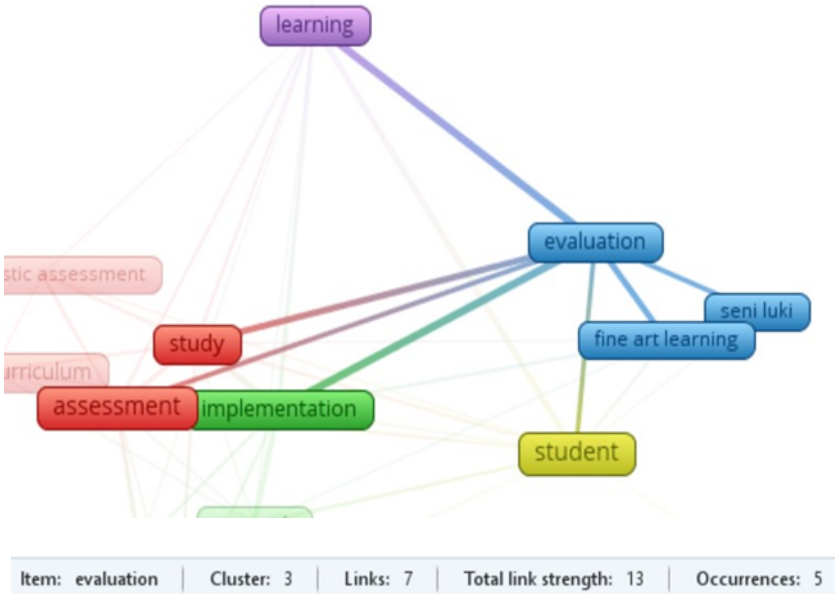


Fig. 12. Connections in terms with the largest network in clater 3

3.4.8 Connections on terms with the largest network on Klater 4

The connection visualization Figure 13 shows the semantic relationships and the power of associations between terms in the domain of fine arts education. Some color clusters represent interrelated topics based on the appearance of terms in the literature. Nodes and Edges: Nodes indicate key terms (e.g.: assessment, evaluation, student, etc.), while edges indicate the strength of connections or associations between those terms. The thickness of the edge reflects the intensity of the relationship. The red cluster contains the terms essmen and study, showing a focus on an evaluative approach in the curriculum [81]. Green Wrna has the term implementation, related to the implementation of learning policies or strategies. Warna Biru (evaluation, painting, fine art learning) focuses on the evaluation and practice of fine art learning. The color Yellow is the term student, focusing on the subject of learning. The color Purple contains the term learning, indicating a broad cross-topic relationship in the context of education [82].

There are a few terms that have the strongest connections; Assessment ↔ Study ↔ Evaluation; It shows that the topics of evaluation and assessment are closely related in academic studies, especially in the context of art education. Student Evaluation ↔; Describe the importance of assessing student learning outcomes as central to the pedagogical approach. Implementation ↔ Evaluation; indicates that the implementation of the method or curriculum is closely correlated with the evaluation process. Learning ↔ Evaluation; This connection signifies that the term "learning" is used widely, being central to the entire pedagogical process. Fine Art Learning ↔; represents the direct linkage between the theory of learning of fine arts and visual practice (painting) [83].

This visualization indicates that evaluation is a central term that connects various domains such as learning, implementation, and student study outcomes. This reflects the evaluative paradigm in modern arts education, where critical reflection and formative assessment are crucial for improving the quality of learning [84].

This visualization of connections provides an in-depth understanding of how important concepts in art education are interconnected, with a strong focus on evaluation as the center of relationships. This reflects an educational approach based on comprehensive reflection, assessment, and implementation in the context of fine arts and student learning.

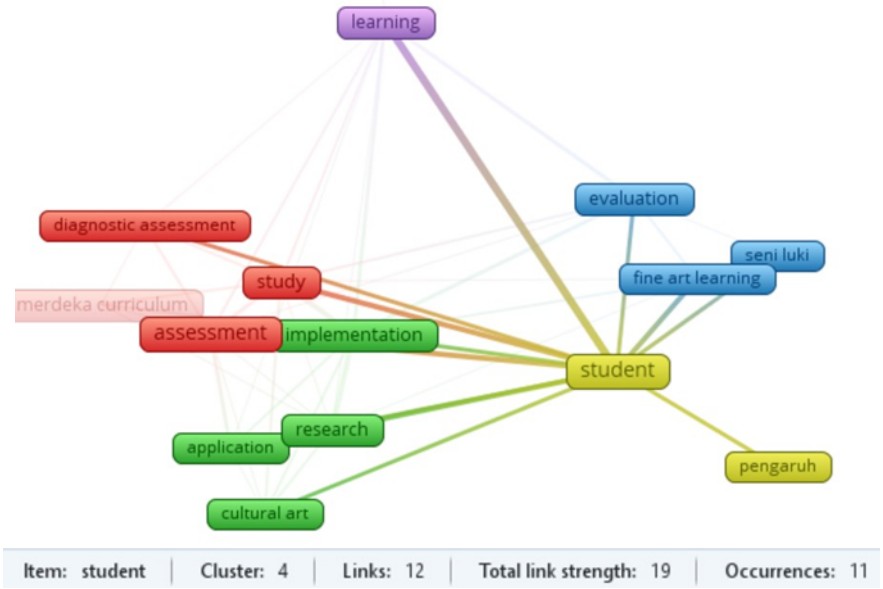


Fig. 13. Connections on terms with the largest network on Klater 5

Figure 14 shows the visualization of term co-occurrence networks from bibliometric studies. Each node represents an important term in fine arts research and education, while the edge indicates the strength of the relationship (co-occurrence) between the terms. Different colors indicate a cluster or thematic group, and the size and thickness of the lines reflect the intensity of the connection. Central Term: "Student", student is the center of connection, strongly connected with terms from various clusters such as; Assessment, Implementation, Research (Green & Red Cluster), Evaluation, Fine Art Learning (Blue Cluster), Learning (Purple Cluster), and Influence (Yellow Cluster). This indicates that students are the main focus in research discourses related to fine arts learning, including in terms of assessment, curriculum implementation, and evaluation of the learning process. Red Cluster; Assessment, diagnostic assessment, study. It shows the importance of an evaluative approach in understanding students' abilities, in relation to curriculum discourses such as "Merdeka Curriculum"[85]. Green Cluster; Implementation, Application, Research, Cultural Art as a focus on the implementation of local culture-based arts policies and development, and shows the relationship between students and contextual research applied in art education [86]. Blue Cluster; Fine Art Learning, Evaluation, Painting is related to the evaluation of art learning, especially painting, which is relevant in the context of formal art studies [87]. Transcluster Connections; The cross-cluster connection between students and all themes shows that students become an integrative axis that connects various approaches to learning, evaluation, and art practice [88].

This visualization features a conceptual map that highlights students as the center of contemporary art education discourse. The integration between evaluation, implementation, cultural arts, and art learning explains the holistic approach needed in the development of a learning model based on the 6Cs (Character, Critical Thinking, Creativity, Citizenship, Collaboration, Communication).

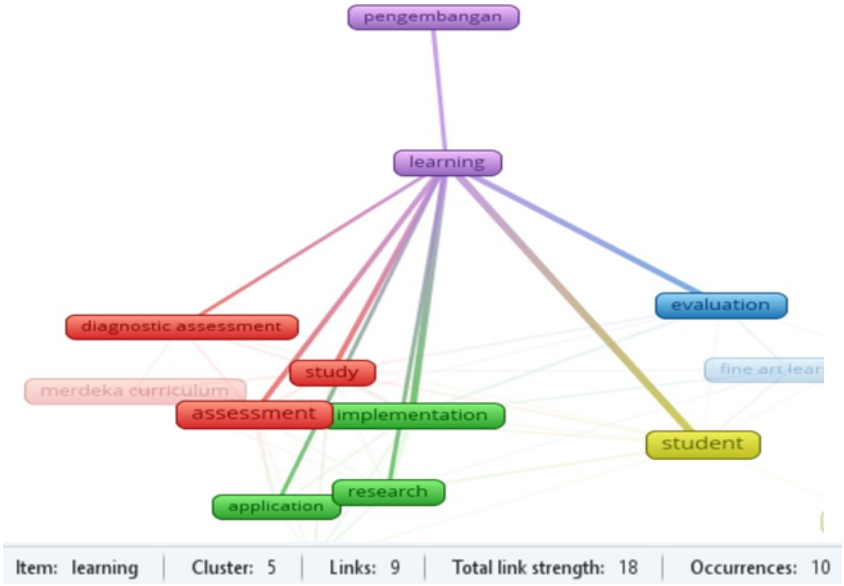


Fig. 14. Connections on terms with the largest network in clater 5

6.8 Research Gap

Figure 15 shows that the terms "development" and "influence" are not directly connected to terms in other categories, especially with key terms such as "assessment", "evaluation", and "fine arts" meaning that there is still minimal research on the development of evaluation or assessment models for fine arts learning. There is still a lack of research on the influence of evaluation or

assessment models on fine arts learning on other aspects such as "learning" or "students" or "fine arts"

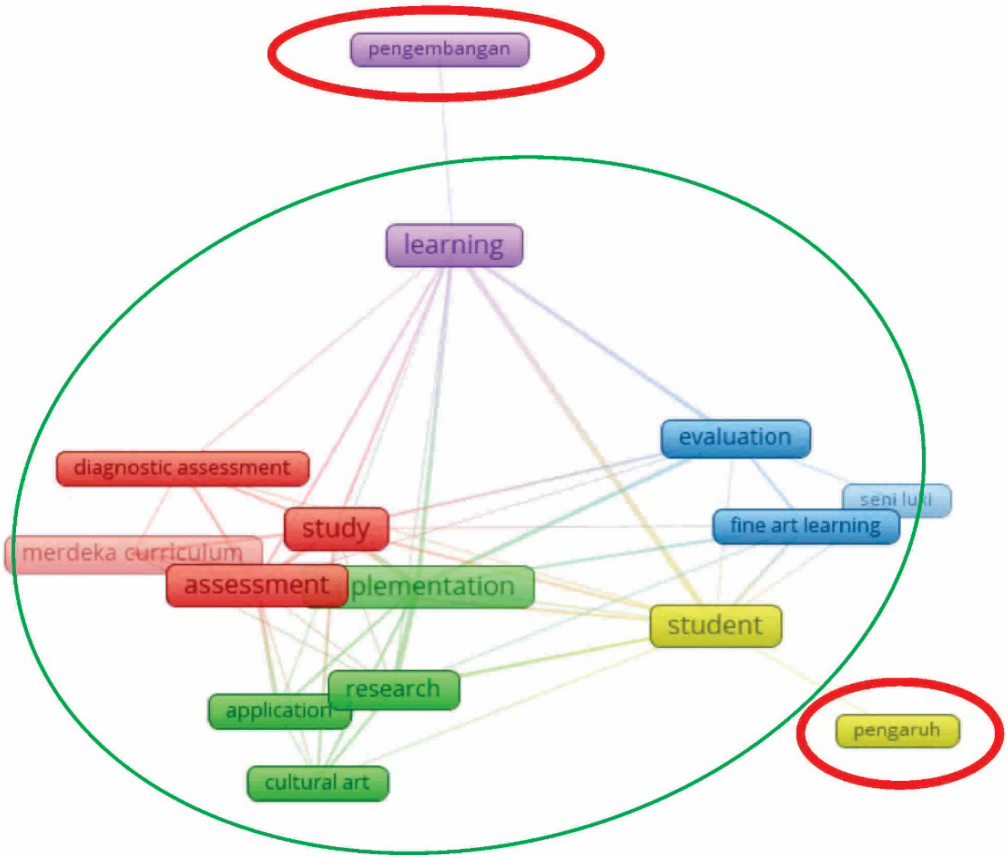


Fig. 15. Research gap

7. Conclusion

Research on evaluation and assessment in fine arts learning from 2019-2024 experienced fluctuations but tended to increase. The decline from 2019-2021 was due to the impact of the Covid-19 pandemic, while an increase occurred from 2022-2024 as the impact of the Covid-19 pandemic began to recede. The results of this study are a mapping and development trend of evaluation and assessment of fine arts learning, which can be used as a reference in compiling more systematic evaluation and assessment of fine arts learning for educators and fine arts researchers in designing learning evaluations that are more innovative and relevant to the challenges of the times. This is especially important in relation to curriculum, formative assessment, project-based learning, and the use of technology. Bibliometric visualization identified five main clusters that show the direction, trends, and interrelationships between important terms in this domain, such as "diagnostic assessment," "curriculum," "fine arts learning," and "implementation." This research is useful as a basis for developing a curriculum and assessment method that is more adaptive to the needs of creative and contextual evaluation of fine arts learning. The recommendation of this research is the need to integrate digital and contextual assessment methods in fine arts learning and collaboration between researchers to strengthen interdisciplinary studies that connect art, technology, and education.

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