



ARTS STUDENTS' CREATIVITY IN WRITING SCIENTIFIC ARTICLES THROUGH CONCEPT MAPPING

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ABSTRACT

Scientific writing is a special or formal writing style used in the scientific community to communicate research, information, and ideas to the wider community. In preparing academic writing, it is necessary to follow a series of specific guidelines and conventions. Therefore, in preparing scientific writing, the writer's creativity is needed. This study examines how students can write scientifically creatively, which is a strengthening for students as prospective arts teachers in the 21st century, through concept mapping. A phenomenological approach was used in this study. Twelve master's program students of the Universitas Negeri Surabaya, Cultural Arts Education Study Program, wrote scientific articles creatively through conceptual mapping that had been developed. To get to the core of their experience, the data were carefully examined through interpretive phenomenological analysis that included an initial focus on the path of inquiry, acquisition of themes through mind mapping, identification of shared meanings, final interpretation, and dissemination of interpretations. Furthermore, the students were interviewed in a semi-structured manner. The findings show that students can write scientifically creatively through the use of conceptual mapping. This is shown by the fourteen student articles compiled, five of which have been successfully published in journals of accredited Sinta two and Sinta four. Three articles have received LoA, and six student articles have not been published in the journal Sinta four. The implication of this finding is that concept mapping can be implemented as a creative and effective learning tool to stimulate students' thinking and creativity, especially in writing scientific articles.

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1. INTRODUCTION

Scientific writing is a formal writing style used in the scientific community to communicate research, information, and ideas to the general public (Bailey, 2003). Academic writing is objective. That is, the emphasis is focused on the arguments and information, not on the writer. It tends to use more passive structures, longer words, and more complex sentences than everyday writing and uses a unique set of grammatical devices that help writers achieve precision and information, avoid ambiguity and misinterpretation, and establish authority and credibility (Strongman, 2013). Scientific writing at university level can be seen as a 'rite of passage' for students to demonstrate the skills they have learned, rather than a task that tests their creative output. Therefore, students at all levels of education in higher education need to have competence in writing scientific articles (Gupta, et. al, 2022).

Raofi, Binandeh, & Rahmani (2017), Hernawan, Syihabuddin, & Mulyati (2023), Tekidur & Kindir (2024) explained that it is necessary for students to have this competency, because it is one of the language skills, and is important for developing students' academic abilities in publishing knowledge in various other disciplinary fields, including cultural arts. In addition, the competence of writing scientific articles can also support students' ability to understand discourse in courses of various disciplines at universities (Pineteh, 2014). This ability is important for students' self-development, to continue their studies to a higher level, and to engage in society. This is because students must hone the ability to communicate their ideas, appreciation, feelings, desires, and experiences to various parties regardless of time and place. This ability is needed by the community, especially academics.

Students' involvement in writing scientific articles is one of the means to assess academic success in higher education (Caruth, 2018; Suharto, 2023). Recent research reveals that students are required to publish their scientific articles to graduate (Darmalaksana & Busro., 2021; Suharto, 2023). Similarly, students in the master program of the Cultural Arts Education Study Program at Surabaya State University are also required to write and publish in reputable journals. Almost all courses in the master's program require students to be able to compile scientific works well, in various forms such as papers, scientific articles for national and international seminars, and articles to be published in scientific journals. In the Study Program, students' ability to write scientific articles is specifically accommodated in the Publication, Research Proposal and Thesis courses.

Writing scientific articles also requires creativity. It is essential to recognize that creativity plays a vital role in scientific writing (Gero, Liu, & Chilton, 2022). It is important because writing scientific articles is an activity that requires critical thinking skills and high creativity. In general, creativity is defined as the tendency to generate or recognize ideas, alternatives, or possibilities that can be useful in solving problems, communicating with others, and entertaining oneself and others. Therefore, to be creative, it is not simply enough to be something new. It needs to have value, or fit the cognitive demands of the situation (Franken, 2009). In addition, creativity is one of the fundamental educational concepts in the past and nowadays. It is found in many 21st century educational frameworks and is also included in the criteria for academic assessment of learners (Kiss & Guo, 2020). Thus, creativity can be defined as having original ideas that have value (Maley & Kiss, 2018). However, it can be interpreted in different ways in different contexts and the difficulty in addressing creativity in education is related to its often-paradoxical relationship with key variables such as novelty, knowledge, intelligence and personality characteristics (Allison, 2004). Therefore, creativity often resists standardized forms of measurement and poses problems for teachers in the classroom.

Creativity in writing scientific articles is not only limited to the creative expression of ideas, but also involves the ability to compose strong and in-depth arguments. Creativity itself, which is one of the 21st century skills, is indispensable in the current era, including creativity in writing. Creativity in writing scientific articles is closely related to 21st century skills, which are essential to deal with the complexity and dynamics of contemporary society. Creativity in scientific writing not only includes aesthetic aspects, but also involves the ability to think critically, analytically, and communicate effectively. Along with the times, 21st century skills are becoming increasingly important as a foundation for individual success in various fields including scientific writing. In addition to the creativity required in writing scientific articles, critical thinking and analytical skills are also required.

Critical and analytical thinking are 21st century skills that are highly relevant in the context of creative writing. Students as creative writers need to have the ability to face information with a critical view, explore concepts in depth, and analyze findings with sharp thinking (Trilling & Fadel, 2009). This critical thinking ability is also needed to formulate strong and in-depth arguments in scientific articles that have been prepared. In addition to these skills, effective communication skills are also a key element in this linkage. Creativity in conveying information through writing requires the ability to use language creatively, choose the right writing structure, and ensure that the message conveyed can be well understood by various readers (Partnership for 21st century Skills, 2007). This reflects the importance of communication skills in attracting and influencing audiences.

Collaboration and team skills are also important elements in developing creativity in writing scientific articles. Co-writing with fellow researchers or collaborating with other experts can open up opportunities for innovative idea exchange, enriching viewpoints and broadening horizons (Trilling & Fadel, 2009). Research and problem solving are integral to creativity in scientific writing. Creativity plays a major role in formulating new solutions and presenting original ideas in the face of research challenges and complexities (Ohio Department of Education, 2007).

In the age of information technology, technological skills are also a determining factor. Utilizing technology in a creative way can enrich data presentation, present information in an interesting way, and increase the reach of scientific articles (Trilling & Fadel, 2009). Thus, it can be said that the relationship between creativity in writing scientific articles and 21st century skills create a strong foundation for the advancement of science and the development of society.

In academic literature, creativity is often identified as an important factor that can improve the quality and impact of scientific writing (Amabile, 2017; Runco, 2014). Therefore, exploring the concept of creativity in writing

scientific articles is relevant in an effort to improve the quality and diversity of scientific literature production. This is reinforced in the results of previous research, namely that there is a positive relationship between creativity and success in writing scientific articles (Simonton, 2012; Beghetto & Kaufman, 2014).

Creativity in scientific writing activities is commonly referred to as creative writing. Suharto (2023) explains that creative writing not only needs to develop writing skills and technology utilization, but also prioritizes novelty, accuracy, and a certain style to improve the quality of scientific publications. In academic writing, creativity often refers to originality and innovative thinking. Therefore, by looking at writing scientific articles as a creative process, researchers can find ways to stimulate creativity in scientific writing, both through creative writing techniques and through the application of innovative approaches, one of which is through concept mapping. Concept mapping are visual tools that can help students organize complex ideas and concept relationships systematically.

Astiantih & Sofyan (2022) and Astiantih & Akfan (2023) in their previous research explained that the use of concept mapping in learning can improve concept understanding and stimulate students' creative power. In this context, the understanding of art concepts is more easily integrated into scientific writing by using concept mapping as a visual guide. In addition, the use of concept mapping can help students find connections between ideas, identify knowledge gaps, and develop strong arguments in their scientific articles. Another study conducted by Heinert (2017) reinforced Astiantih & Akfan's research explaining that students often face challenges in expressing their creative ideas in writing. Therefore, creative approaches such as the use of concept mapping can provide solutions to overcome these obstacles and stimulate creativity in writing scientific articles. By combining the advantages of concept mapping and the needs of art education students, it is hoped that an innovative approach in learning to write scientific articles can be created.

This study differs from previous research in that it makes a unique contribution to the discipline of teaching creative writing to high school students through the use of the concept mapping approach, which has received little attention in the context of science and health education. In contrast to previous research that primarily focused on conventional techniques in developing academic writing skills (Raofii et al., 2017; Hernawan et al., 2023; Ismail, 2024), this study investigates how concept mapping can bring out critical, creative, and systematic writing abilities in academic writing. While, most previous studies have examined traditional strategies for improving students' academic competence (Pineteh, 2014; Caruth, 2018), the present study presents an innovative visual approach to evaluating and developing senior thesis topics in arts.

In order to improve the coherence and argumentation in their articles, students might use concept mapping to look at the relationship between ideas in a more systematic and creative way. Additionally, this study provides empirical evidence on the efficacy of concept mapping by reducing its effect on student audience engagement. The research results show that most of the student-written articles using this approach were published in the accredited Sinta 2 and Sinta 4 journals, which proves that this method not only helps students with sentence structure but also improves their academic quality.

The implication of this research goes much beyond simply showing that idea mapping is a visual aid; it can also be an effective pedagogical method for increasing students' creativity and critical thinking skills when reading and writing academic texts. This research can serve as a foundation for curriculum development that is more focused on creativity and visual problem-solving, and it also contributes to the creation of more innovative and applicable learning models in secondary education. Thus, in the study of academic literacy in the field of arts and culture, this research offers a new perspective, and fills the research gap on improving the scientific writing skills of art students effectively.

For arts education students, writing scientific articles is an activity that can be said to be not easy. Many obstacles are faced by students during the preparation of articles and in the process of uploading articles to the intended journal. This expression is in line with the problems faced by students of the Master of Arts Education Study Program at Surabaya State University. In fact, art education has an important role in developing student creativity, including the ability to write scientific articles.

Based on a preliminary study conducted through a survey using *google form*, it is known that there are still obstacles in preparing articles for students, including students' lack of understanding of the article writing template contained in the intended journal, limited ability to process writing with good and correct language and sentences in accordance with the writing style of the intended journal, and confusion in preparing articles related to the thesis currently under study. This is because thesis writing has not yet reached the writing of research results. In addition, students still have difficulty writing research results and conclusions that need to be in the article. This research is based on the phenomenon among master's students, including art education students, related to the low ability to write scientific articles. Therefore, the need for master students to be able to write scientific papers/articles properly and correctly becomes something urgent, especially the aspect of student creativity in writing scientific papers. Related to this, the purpose of this study is to examine how students can write scientific articles creatively which is a strengthening for students as prospective art teachers in the 21st century through concept mapping.

2. METHOD

The phenomenological approach used in this study is to explore students' creativity in scientific writing through the development of concept maps. In addition, the phenomenological approach is used to explain the meaning of the lived experience of a number of people about a concept or symptom, including their own self-concept or worldview, which in this case is the experience of students in writing scientific articles (Leavy, 2017). The phenomenological approach is used in this study to explore students' creativity in scientific writing through the development of concept maps. In addition, the phenomenological approach is used to explain the meaning of the lived experience of a

number of people about a concept or phenomenon, including their own self-concept or worldview, which in this case is the experience of students in writing scientific articles (Leavy, 2017). This expression is in line with the opinion of Creswell (2018) who explains that the phenomenological approach is an inquiry design in which researchers describe individual lived experiences of a phenomenon as described by participants. This description culminates in the essence of the experiences of several individuals who have all experienced the phenomenon. This design has a strong philosophical basis and usually involves conducting interviews. The life experience of a number of people referred to in this study is the creativity and ability of art education students in writing scientific articles through the development of concept mapping. For most art students, writing scientific articles is an activity that can be said to be not easy. This expression is in line with the opinion of Creswell & Cresswell (2018) which explains that the phenomenological approach is an inquiry design in which researchers describe individual life experiences about a phenomenon as described by participants. This description culminates in the essence of the experiences of several individuals who have all experienced the phenomenon. This design has a strong philosophical basis and usually involves conducting interviews. The life experience of a number of people referred to in this study is the creativity and ability of art education students in writing scientific articles through the development of conceptual mapping. For most arts students, writing scientific articles is an activity that can be said to be not easy. This is an interesting phenomenon to study.

The Master of Arts and Culture Education students of class 2021 and class 2022, totalling 12 students, became research subjects as well as purposive sampling samples in this study. The twelve students were observed and interviewed regarding the exploration of creativity in making scientific articles. In addition, FGDs were conducted through zoom meetings. FGDs were carried out not only between researchers and students, but also between researchers from UNESA, UNY, and students, as well as with editors, involving journal resource persons / editors. The Master of Arts Education students of class 2021 and class 2022, totalling 12 students, became research subjects as well as purposive sampling samples in this study. The 12 students were observed and interviewed regarding the exploration of creativity in making scientific articles. In addition, FGDs were conducted through zoom meetings. FGDs were conducted not only between researchers and students, but also between researchers from Surabaya State University, Yogyakarta State University, and students, as well as with editors, involving journal sources / editors.

3. RESULTS AND DISCUSSION

Writing scientific articles, for arts students are an activity that can be said to be not easy. Many obstacles are faced by students during the preparation of articles and in the process of uploading articles to journals. This can be seen at the beginning of learning the Publication, Research Proposal and Thesis courses held. In fact, it is important for master program students of arts education to have the competence to write scientific articles. However, based on preliminary studies conducted, there are still many students who lack these competencies.

In this 21st century, students as agents of change have a very important role, especially master program students, including students of UNESA Cultural Arts Education master program. Pujiriyanto (2021) in his article entitled: "*The Role of Teachers in 21st Century Learning. PPG Module in 2021*" states that there is a shift in the needs of Human Resources (HR) which shifts low-level skilled HR (handwork) with high creativity HR work. Master program students are required to have a high level of creativity skills, including the ability to write articles from their research, observations, and publish in scientific journals. The ability to compile articles and publish to journals is almost present in every course taken by UNESA Master of Cultural Arts Education students.

Basically, critical thinking and problem-solving skills as demands of 21st century teacher candidates, have been applied by students in various article studies. This can be seen from the variety of topics taken by students to compile scientific articles. The recap of the article titles of the FBS UNESA Master of Cultural Arts Education student can be seen in Table 1.

Table 1- Student Article Titles

Student Name	Article Titles
Tika	Art Education in Indonesia: History, Role, and Future Challenges
Narindra	Art Education as a Means of Developing Creativity in Choir Training
Victor	Sapto Hari Utomo: Creative and Child-Friendly Artist
Erna	Educational Values in the Traditional Ritual Procession of Keboan, Aliyan Village, Rogojampi District, Banyuwangi Regency
Kristiana	Development of Vocal Technique Modules on Arts and Culture Subjects Assisted by <i>Online Tutorials</i> for High School Students
Bayu	Heru Prasetyono's Creativity in Developing Children's Potential through String Ensemble Learning
Nesti	Development of Project-Based Dance Learning Teaching Materials Model to Increase the Creativity of Class Xi High School Students
Achmad	Development of Android-Based Keroncong Music Learning Media for Class XI Vocational Students
Joshua	The effect of using practice programs on improving the ability to play basic drum instruments
Mellany	Aesthetic Criticism of Dancers Costumes at Jaranan Pegon Performance in Trenggalek

Alif	Art Therapy: Creative Educational Media to Overcome Adolescents with Disorders
Syna	Aesthetic Experience in Theatre In Non-Formal Education: A Review of Creativity Theory

Based on Table 1, it appears that the titles taken by students vary greatly, including those related to fine arts education, choir training, character studies, ensemble music learning, art therapy, learning media development, dance teaching material development, drum band instrument practice learning. With the diversity of themes / titles, it can be said that students are critical of various art problems and problems according to the focus of research taken. Thus, students as agents of change can be relied on in solving various problems with their critical attitude. Meanwhile, creative and innovative aspects that are 21st century skills are also seen in table 1, where students can determine writing themes in preparing articles creatively. It is clear that there is a close relationship between critical thinking skills, problem solving, and creativity that students need to have in writing articles. With these critical thinking and problem-solving skills, student creativity can increase, especially in writing articles. This expression is reinforced by Rababah, Abdul, & Malek (2013) and Baucus, et.al (2008) who explain that creativity plays an important role in shaping students' lives. Nowadays, the improvement of students' creativity has become a major goal of all societies. Such improvement can make an important difference in the way students think and the way they solve problems including in writing scientific articles.

Because creativity has a very important role in writing scientific articles, creativity needs to be owned and developed by students. This is because creativity allows students as writers to present ideas and findings in interesting and innovative ways. With the element of creativity in writing scientific articles, students as academic writers no longer only tell stories, but also show what is found from their research, and provide understanding for readers related to what it means about the world. Creatively done writing provides more space and more independent for readers to enjoy. A creative text doesn't tell the reader how to read it. This text creates a setting that allows subtext to appear, allowing the reader to immerse themselves in an experience. Creativity also helps students as writers to think of new approaches in exploring research topics and presenting research results in a way that appeals to readers. The phrase is reinforced by Tse & Shum (2000) cited by Rababah, et.al (2013) in their research explaining that, creativity is an important aspect in writing. In addition, creativity is one of the six levels of language skills. Therefore, increasing students' creativity in writing is one of the skills that EFL students including Arts Education students need to develop during their school years (Rababah, et. al, 2013; Ibrani, 2010).

There are several benefits for students in participating in creative writing learning in addition to being accustomed to expressing their personal expressions, students are also increasingly aware of creating the language itself. Gradually, students can develop their writing to be more communicative (Alwasilah, 2015). Similarly, Maybury (Percy, 1981) cited in Alwasilah (2015) states that students can use their ideas, impressions, feelings, hopes, imagination, and language creatively in writing scientific articles.

This expression can be seen in the results of research obtained that students experience the development and increase of their creativity in writing, especially through the use of concept maps. The concept map itself is a form of visual organization that can be used to categorize and represent knowledge about a particular subject or related subjects and encourage the development of these critical skills (Cooper & Zimmerman, 2020). The reason concept maps are used in this study is because they are useful for organizing ideas and connecting concepts in writing scientific articles conducted by students. By using concept mapping, students can easily organize the information presented in the student's scientific articles. Thus, the use of concept maps can increase the creativity of UNESA Cultural Arts Education master students in writing scientific articles. By mapping these ideas in a concept map, students can see the relationship between these ideas, and connect concepts related to the topic of the article to be written. It is also ensuring that student scientific articles have a clear and structured flow. In addition, learning to write scientific articles under the Publication, Research Proposal and Thesis courses becomes fun. This is because lecturers provide material and methods that suit the needs and interests of students (Alwasilah, 2015).

In this study, observations of student creativity in writing scientific articles using concept mapping were observed and discussed through online mode with zoom. These activities can be seen in figures 1, 2, dan 3.

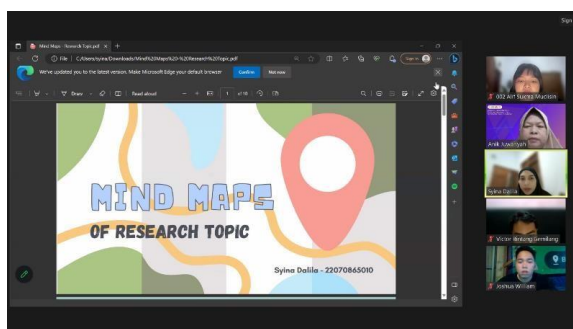


Figure 1. Zoom meetings discuss research topics using concept mapping on Syna Dalila

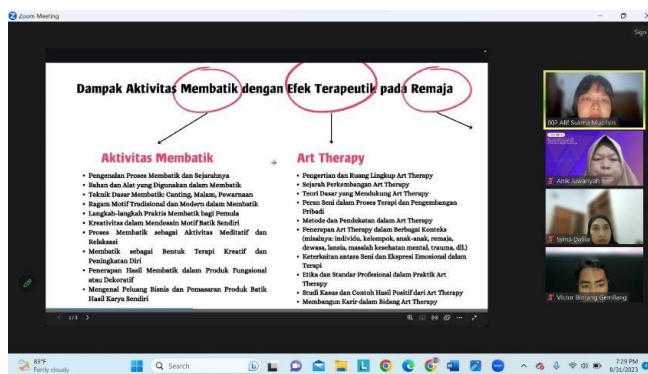


Figure 2. Discussion on the development of article concepts that will be compiled by Alif Sukma through concept mapping about Art Therapy



Figure 3 - Discussion of the title of the Joshua Suherman article through the concept mapping about drum instrument practice

In Figures 1, 2, and 3, students can be seen conveying their research topics and article title concepts through the use of concept maps. Here it appears that the creativity of students in determining research topics and formulating article titles to be compiled. Through interviews conducted with these students, it is known that students understand better and it is easier to compile research topics and formulate article titles using concept mapping.

Before the discussion related to determining research topics and article titles that will be compiled using concept mapping, the researchers first held a meeting with the students involved. The meeting was held once a week to deliver materials related to concept mapping and the development of creativity in writing scientific articles through concept mapping. One of these activities can be seen in Figure 4.

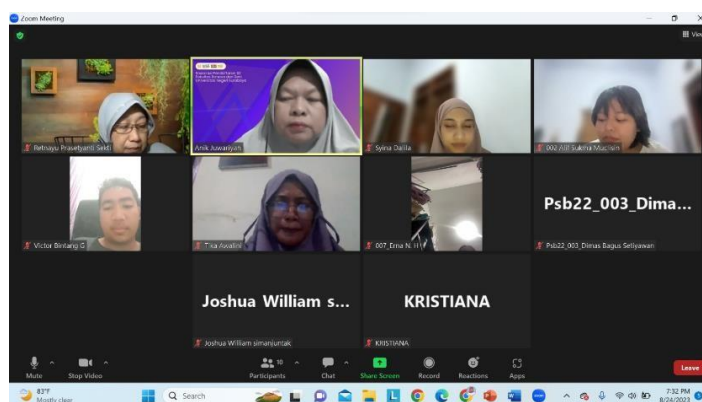


Figure 4 - The chief researcher conveys the concept map material in developing students' creativity in writing scientific articles

In Figure 4 it can be explained that the lecturer (in this case as a researcher) provides an explanation of the concept mapping and its implementation in writing scientific articles creatively. In this explanation, the researcher gave an example of developing creativity through a concept mapping in writing scientific articles by taking one word, namely "Ponorogo". Students were asked to elaborate on matters related to the word "Ponorogo". As for the description of one word, namely "Ponorogo" emerged words such as *reog* related to costumes, folklore, festival *reog*, *jathil*, *ganongan*, *reog dance movements*, *warog*, *dadak merak*, *reog supplement books* for PBM, *reog endhut*, *jathil obyog*, and *Reog dance accompaniment*. In addition, other words related to "Ponorogo" also appeared, namely *dawet jabung*, *pecel ponorogo*, *ngebel lake*, and *grebeg suro*.

Meanwhile, the words that have been generated related to the word "Ponorogo", can then be used by adjusting the development of the desired topic of each student. The topics referred to in this study include text and context, where the text is related to the title to be formulated in writing scientific articles. For example, the title of the article "Dadak Merak Performance Art Form", and "Analysis of Reog Ponorogo Dance Accompaniment Song Form". Regarding the context, the titles that can be formulated by students include "The Function and Meaning of Dawet Jabung Dance as a Cultural Transformation of Performing Arts", and "Social Changes in the Ponorogo Community as an Impact of the Development of East Java Traditional Arts".

Providing examples of the use of concept mapping in developing student creativity in learning publications and writing scientific articles is considered appropriate and in accordance with the acquisition of 21st century skills. This is in line with the National Core Arts Standards quoted by Cooper & Zimmerman (2020) that the newly adapted core arts standards emphasize students thinking and learning processes that reflect critical 21st century skills such as synthesizing, visualizing, creating, and systematic thinking. In addition, the use of concept maps provided by the research team who are lecturers of art (dance and music) is also strengthened by research conducted by Cooper & Zimmerman (2020) which explains that art educators have used concept mapping to build student creativity, and connect visual analysis through the lens of research and practice, including the practice of writing scientific articles. Another research conducted by Sullivan (2014) which also strengthens the use of concept mapping in developing student creativity in writing scientific articles, as well as developing other 21st century skills, namely critical thinking skills, and digital literacy, so that students are able to analyze each object they choose into topics to be written into scientific articles explains that today's digital environment provides a supportive contemporary setting for content analysis, looking for patterns, applying inductive mapping strategies, and analyzing matrices. Therefore, concept mapping can be used as a means by which information can be explained, analyzed, and interpreted to create avenues through which research and practical aspects of teaching and learning can be built and developed.

Based on this, in the online meeting held, students seemed enthusiastic about listening to the explanation given by the lead researcher regarding the use of concept mapping that can develop creativity in writing scientific articles. This was revealed from the results of an interview with one of the students (Alif Sukma Muchlisin) who explained that it is very interesting and exciting to use concept maps in writing scientific articles. The use of such concept mapping is helpful in finding the points that will be outlined in the article. The phrase is as Cooper & Zimmerman (2020) said that concept mapping is a form of visual organization that can be used to categorize and represent knowledge about a particular subject or related subjects, and this encourages the development of critical and creative skills. Concept mapping is a strategy that began in the late 1990s (Novak, 1998 in Cooper & Zimmerman, 2020) that uses concepts and propositions as central elements in structuring knowledge and creating meaning. At the end of the meeting held with students with a discussion agenda to compile a concept map, students were given the task of compiling a concept mapping in accordance with the draft scientific article to be written, and the concept mapping that had been compiled was collected through Google Drive.

In this article, the concept mapping of students who have been collected is analyzed and discussed again through meetings conducted online. The results of discussions with lecturers show that student creativity has developed in determining the topics of scientific articles draft to be prepared using concept maps. One example of a concept mapping from students can be seen in Figure 5.

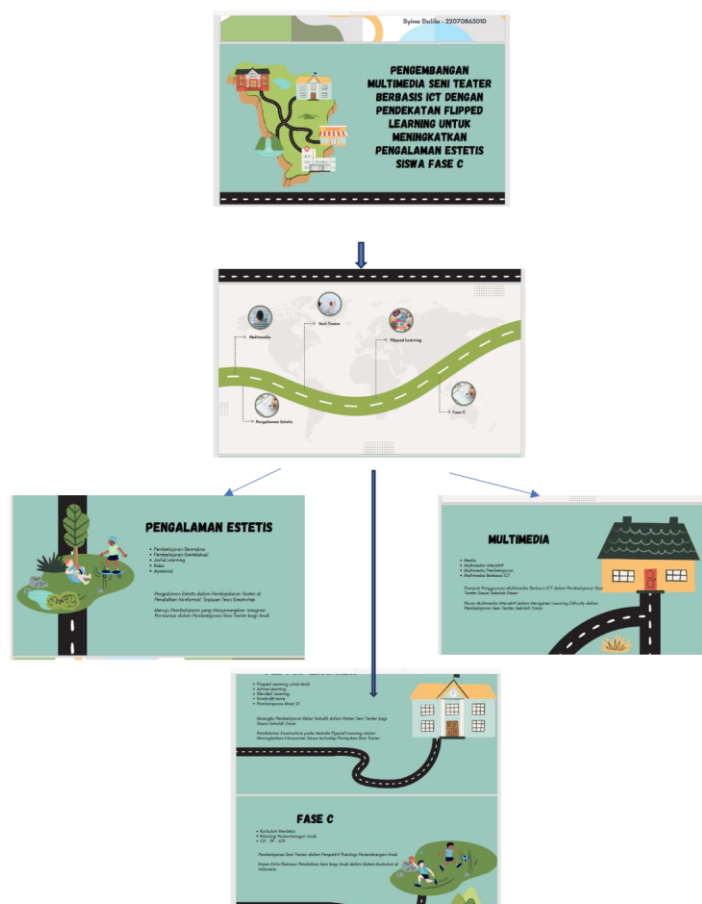


Figure. 5 - Concept mapping compiled by Syna Dalila

The preparation of concept mapping by Syna Dalila as shown in Figure 5, it can be said that the concept mapping process supports critical systematic thinking strategies. These students can define and practice scientific article writing planning that is integrated between arts and technology. Meanwhile, regarding the shape of the concept map itself, Syna Dalila use round shapes, house shapes, line shapes (such as roads). These shapes are to explain the concept. Meanwhile, the use of color is intended for components, while the shape of lines made like a road is to contact one concept with another, and all of it is framed in a box frame (Cooper & Zimmerman, 2020). Thus, it can be said that the student is effectively able to apply prior knowledge, skillfully in organizing, skillfully in synthesizing, and have critical thinking strategies about the topics that will be outlined in their scientific article writing. Learning how to make concept mapping is one of the important first steps for students including arts education students, both to understand their research studies and for points to be developed and written in compiling scientific articles, and it is one aspect that can develop creativity.

The development of student creativity through the use of concept mapping in writing scientific article has resulted in articles published in several Sinta indexed journals, both Sinta 4 and Sinta 2. Furthermore, the results showed the creativity of art education students in writing scientific articles using concept maps. Thus, it can be said that the use of concept maps in education is one way to develop students' creative power to learn about a material including learning to write scientific articles. By mapping concepts, students can be helped to learn more and have fun in supporting learning to write scientific papers taught by lecturers. This is in accordance with what is explained by Novak (1970) cited by Astiantih & Akfan (2023) that concept maps have been used more widely in various fields of study including the field of art studies, and with various types of students. Overall, it was explained that the use of concept maps graphically represents different ideas written in circles or other shapes, and includes lines or arrows that indicate the direction between the ideas. The use of concept maps also including words or phrases that describe the exact nature of the relationship between the ideas. By using concept maps, it could be made the emphasis on writing skills more effective than other skills, and be able enhance and develop aspects of student creativity.

4. CONCLUSION

The research findings indicate that the mapping concept effectively enhances the creativity of art students in composing scientific articles. Students employing this methodology can construct articles with a more organized framework, elaborate on concepts more thoroughly, and formulate more compelling arguments in their scholarly papers. The findings indicated that out of the fourteen articles produced by students, five have been successfully

published in SINTA 2 and SINTA 4 authorized journals, three have obtained a Letter of Acceptance (LoA), and six remain in the publication process. This suggests that concept mapping aids in writing preparation and enhances the academic quality of the resultant papers.

This study indicates that concept mapping fosters critical, creative, and analytical thinking in pupils. Concept mapping enables students to graphically link diverse ideas, facilitating their comprehension of the interconnections among essential concepts in scientific writing. Furthermore, interviews revealed that the majority of students experienced increased confidence in writing after employing this method, as they received explicit coaching in framing arguments and organizing information.

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