Analysis of Research Trends in Theses of Early Childhood Education Teacher Education Students Universitas Negeri Medan 2019-2023

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Abstract. This study aims to analyze the trends in research focus conducted by students of the Early Childhood Education Teacher Education program, Universitas Negeri Medan, from 2019 to 2023. A literature review was employed as the research method. Data was collected through a document study using metadata from the Universitas Negeri Medan digilib repository, comprising 158 documents. The VOSviewer application was used to analyze the data and create a bibliometric network visualization using the overlay option. The results indicate that several keywords are currently trending, including: speech delay, smartphone impact, folding, fine motor skills, collage, plasticine, social interaction, character education, children's good character, creativity, development, expressive language, storytelling methods, hand puppets, bigbook media, media, discipline, economic tokens, smart trees, traditional play methods, children's social and emotional abilities, language skills, flashcard media, sexual harassment, "I can take care of myself" books, learning planning, science learning, playing blocks, size and shape recognition, color, counter board, STEAM, management, infrastructure, morals of 5-6-year-old children, career women, children's personality, moral intelligence, children's independence, YouTube applications, children's social skills, role-playing methods, jump rope games, clog games, and circuit games. The study concludes that emerging trends in student research for 2023 can be categorized into language development, character building, learning media, and traditional play methods.

Keywords: Research Trends, Early Childhood Education Teacher Education, VOSviewer, Bibliometrics

1 Introduction

Early childhood education is education that focuses on the growth and development of children. At this time, early childhood education has begun to realize the importance of education for early childhood. This is reflected in the increasing number of studies conducted in this field, including at the thesis level. Medan State University as one of the educational universities in Indonesia has many study programs, one of which is the Early Childhood Education Teacher Education Study Program which has contributed to producing graduates who have the competence to educate early childhood. Student thesis research is one of the important indicators to see the development of science and practice of Early Childhood education.

A thesis, as a scientific paper compiled by students as one of the requirements to complete a Bachelor's degree, has a crucial role in advancing a discipline. In the context of early childhood education, a thesis is not only a graduation requirement but also a forum for students to explore more deeply the current and relevant issues of early childhood education. Through thesis research, students are expected to be able to produce new findings that can contribute to the development of early childhood education theory and practice.

The Early Childhood Education Teacher Education Program is one of four study programs at the Faculty of Education Universitas Negeri Medan, as one of the educational institutions that focuses on developing the competence of early childhood teachers, has a strategic role in producing graduates who are able to answer the challenges of early childhood education. Thesis research produced by students is a benchmark for the success of the study program in producing graduates who not only have theoretical knowledge but also have the ability to conduct research independently.

Universitas Negeri Medan is one of the leading state universities in North Sumatra with a very strategic location. Universitas Negeri Medan 's main campus is located on Jalan Willem Iskandar, Pasar V Medan Estate, Percut Sei Tuan, Deli Serdang. The location of the campus in an area that is quite far from the center of Medan makes the learning atmosphere more calm and conducive. Access to the campus is also quite easy using either private vehicles or public transportation. The environment around the campus is also equipped with various supporting facilities such as libraries, laboratories, and sports facilities. With all its advantages, Universitas Negeri Medan continues to strive to improve the quality of education and campus facilities to provide the best for students. Universitas Negeri Medan not only offers a comfortable learning environment, but also has great development potential. Its strategic location allows Universitas Negeri Medan to collaborate with various parties, both government, industry, and the community. This provides opportunities for students to be involved in various activities that can develop their potential. In addition, Universitas Negeri Medan also continues to strive to improve the quality of research and community service. Thus, Universitas Negeri Medan is not only a center for education, but also a center for the development of science and technology.

Universitas Negeri Medan is an educational unit that organizes higher education, research, and community service that functions to provide fair and quality services to students and prepare students who have academic and professional abilities to apply knowledge, technology, and the arts through the learning process in the fields of education and non-education. The Early Childhood Education Teacher Education Study Program, Faculty of Education, Universitas Negeri Medan is an academic implementing element of Universitas Negeri Medan that carries out the main tasks and functions of Universitas Negeri Medan as an organizer of higher education through the learning process in the field of early childhood. Graduates of the Early Childhood Education Teacher Education study program are entitled to a Bachelor of Education degree. Graduates have job opportunities that are adjusted to their expertise in the field of Early Childhood Education.

Graduates of the Early Childhood Education Teacher Education Study Program at Universitas Negeri Medan are well-prepared for a variety of roles in the field of early childhood education. Many graduates pursue careers as early childhood educators, working in kindergartens, preschools, and playgroups. They are skilled in creative and innovative teaching methods and are proficient in using technology to enhance learning experiences. In addition to teaching roles, graduates may also find opportunities in early childhood education management or administration. Some graduates may choose to work as early childhood education program developers or consultants, contributing to the development and implementation of effective

early childhood education programs. These diverse career paths reflect the broad range of skills and knowledge gained through the program.

Research trends in early childhood education continue to evolve with societal and scientific advancements. By analyzing the research focus trends of early childhood education teacher education students at Medan State University from 2019 to 2023, we aim to gain a clearer understanding of the primary concerns of researchers in this field. Additionally, this analysis can help identify research gaps and inform future research directions.

Bibliometric mapping is a quantitative analysis technique that employs visualization methods to illustrate relationships between scientific publications. The term "mapping" refers to the process of creating a visual representation of complex data. In the context of bibliometrics, the data mapped includes information derived from scientific publications, such as keywords, authors, institutional affiliations, and journals. The results of this mapping are presented in the form of graphs or diagrams that depict the relationships between various elements within a knowledge network. In essence, bibliometric mapping generates a "map" of the research landscape, where each point represents a concept or entity (e.g., an article, author, or keyword), and the lines connecting these points signify the relationships between them. Through this visual representation, we can observe how ideas evolve, how researchers collaborate, and how different scientific fields interconnect.

Bibliometric mapping is a quantitative analysis technique used to visualize the relationships between scientific publications. By employing this method, we can visually comprehend the development of a scientific field, identify influential researchers, and discern trending topics. The process involves collecting publication data from various sources, such as scientific databases like Scopus and Web of Science, followed by data analysis using specialized software (e.g., VOSviewer, CiteSpace). The results of the analysis are then visualized in the form of graphs, maps, or network diagrams.

The benefits of bibliometric mapping are extensive. Bibliometric mapping can aid in understanding the overall research landscape, identifying research gaps, and evaluating the research performance of institutions (Egghe & Rousseau, 1991). In essence, bibliometric mapping provides a comprehensive overview of the dynamics within a scientific field.

Bibliometric mapping plays a crucial role in various fields, including science, education, and policy. In the realm of science, bibliometric mapping can assist researchers in identifying relevant research topics and avoiding redundant research (van Eck & Waltman, 2010). In education, bibliometric mapping can be used to evaluate the research performance of faculty and students, as well as to develop curricula aligned with scientific advancements (Lutz, 2015). In the policy domain, bibliometric mapping can support decision-making regarding the allocation of research funds and the development of scientific research. Bibliometric research is an effective method for quantitatively analyzing scientific publication data. By employing this method, we can identify frequently researched topics, popular research methods, and collaboration networks among researchers. The results of bibliometric analysis can provide a comprehensive understanding of the research landscape in the field of early childhood education.

2   Research Method

The research method employed is a qualitative approach through a literature review. The literature review involves four stages: identification, screening, feasibility assessment, and

analysis. During the identification stage, the researcher sourced thesis data from the Medan State University Digital Library for the period of 2019 to 2023. However, for 2023 thesis data, a direct search was conducted as it was not yet indexed in the digital library.

The screening stage involved selecting and filtering theses relevant to the specified research period. Subsequently, the feasibility assessment stage focused on evaluating the completeness of metadata. Theses with complete metadata were deemed suitable for analysis. Data analysis was conducted using VOSviewer software. The analysis method employed was co-occurrence analysis, which involved analyzing keywords with a minimum frequency of one. The results of the analysis were visualized through network visualization, overlay visualization, and density visualization.

Table 1. Distribution of Student Thesis Data 2019-2023

Year	Publication	Not Used	Used
2019	19	6	13
2020	23	3	20
2021	56	-	56
2022	60	6	54
2023	15	-	15
Total	173	15	158

The researcher continued to identify the data found. Of the 173 thesis data, 15 were excluded at the identification stage as they were either lecturer articles or duplicates. Therefore, based on the specified data criteria, 158 thesis data were utilized for the research.

3   Results and Discussion

Based on the Overlay Visualization mapping, the trend of topics raised by students can be observed. Emerging trends include keywords such as speech delay, smartphone impact, collage, YouTube application, language skills, flash card media, learning planning, science learning, and creativity. Conversely, keywords like rhythmic gymnastics, emotional intelligence, employment status, gross motor skills, verbal linguistic abilities, audiovisual media, rewards, cognitive abilities, beading, funmath, arrangement, indoor learning environment, collage activities, and children's creativity were more popular before 2020 see Figure 1.
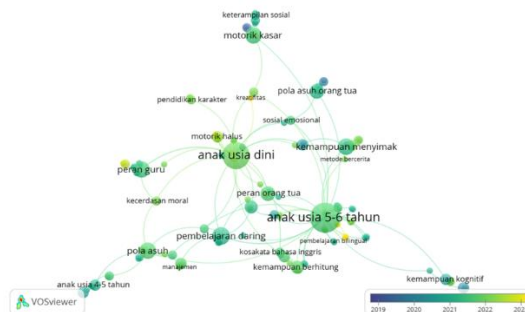

Fig. 1. Research trends in early childhood education theses by Unimed students from 2019 to 2023

T Pakpahan (2023) focused on speech delay, a condition characterized by children's inability to speak clearly or have a limited vocabulary, setting them apart from their peers. As Hurlock (2013) noted, "If a child's speech ability does not match that of their peers, then they may have a speech delay." The research aimed to determine the prevalence, causes, and management of speech delay in children. (Pakpahan, 2023).

Tarigan (2023) explored the impact of smartphones on early childhood development. The study highlighted the lack of parental supervision, leading to children's unrestricted access to various applications. This unsupervised use can negatively impact children's ethical development. Common issues include children's free access to inappropriate content and parental unawareness of the potential consequences. The study employed a qualitative descriptive research design. Data was collected through interviews and observations. To ensure data validity, triangulation of sources and time was used. Qualitative analysis techniques were applied to analyze the data. The study concluded that smartphones, when used appropriately and with parental supervision, can have both positive and negative impacts on children aged 5-6. However, excessive and unsupervised use can be detrimental to their development. It's crucial to limit screen time and carefully monitor the content children access. (A. G. T. Tarigan, 2023).

The topic of collage was explored in three studies. The first author is Pratiwi (2020) who studied children who did not dare to give their opinions about collage activities, children's curiosity about collage activities was still lacking, children were not yet able to combine origami colors into patterns, children could not focus on working on their collage work and children could not add ideas according to their imagination to the results of their collage work so that this study aims to see how the creativity of group B children is in collage activities at TK NEGERI PEMBINA 1 BINJAI, The study used a quantitative descriptive approach. The sample used was 10 children consisting of 4 boys and 6 girls. The data collection techniques used were observation and assessment document studies. The results of the data analysis are presented using a descriptive method in the form of percentages and criteria. The results of the data analysis show that these ten children have different levels of creativity abilities. Children's creativity can be seen when they do collage activities with different work results from their friends. The average percentage of children's creativity criteria is 2 children in the very good category, 2 children in the good category, 6 children in the less good category (Pratiwi, 2020). The second author is Harahap (2021) who studied the Fine Motor Skills of Children Aged 5-6 Years Through Collage Activities at Faozan Kindergarten, Panobasan Village, South Tapanuli Regency in 2020/2021. The qualitative descriptive research approach with data analysis techniques in the form of data reduction, data presentation and drawing conclusions. The research sample was 3 out of 15 students at the research location. Data collection techniques using observation and interviews. The instruments used are interview guidelines and observation sheets. Based on the findings at Pauzan Panobasan Kindergarten, it can be seen that the achievement of children's fine motor development is at a developing achievement level when using collage media, namely: (a) the ability to plan images (b) the ability to prepare various tools and materials., namely: (a) the ability to plan images (b) the ability to prepare various tools and materials needed (c) the ability to recognize various names of equipment and the ability to explain how to use tools (d) the ability to be able to stick (e) explain the correct and correct position when sticking and demonstrate it so that the results of the stickies do not go outside the lines (f) practice should be done repeatedly so that children's fine motor skills are trained. The study concluded that all methods carried out through collage activities can be implemented well and provide stimulation for fine motor development in early childhood.. (S. A. Harahap, 2021). The third author Harahap (2023) who studied this study aims to determine

the effect of collage activities on the fine motor skills of children aged 5-6 years at the Batang Bulu Barsel State Kindergarten, Padang Lawas Regency. This type of research is quantitative research (experimental) using the pretest-posttest Control Group Design. The sample of this study was 14 children in group B at the Batang Bulu Barsel State Kindergarten, Padang Lawas Regency. The independent variable is collage activities while the related variable is fine motor skills. The data collection instrument is through observation guidelines, the data analysis technique used is descriptive statistics. Based on the results of the data analysis, namely tcount> ttable (16,627> 2.144). So in this study Ha is accepted and H0 is rejected, meaning that learning with collage activities has a significant influence on children's fine motor skills (H. Harahap, 2023).

The topic of YouTube applications was explored in two separate studies. First, Silalahi (2021) investigated Utilization of the YouTube application as a learning resource for teachers to provide inspiration for creating educational game tools.. The qualitative descriptive study aimed to determine how teachers could utilize YouTube to develop engaging and educational games for children. Data was collected through observation, interviews, and documentation, and analyzed using interactive analysis techniques. The study found that YouTube was an effective tool for teachers to create educational game tools, but recommended improving supporting facilities and diversifying the types of games created (Silalahi, 2021). Second, Nisa (2023) examined the impact of the YouTube Kids application on children's social development. The study involved interviews with parents of children aged 5-6 years who used the YouTube Kids app. Parents reported that the app was safe, educational, and age-appropriate. Children enjoyed the app's content and were able to learn and interact with others. However, the study emphasized the importance of parental supervision to ensure safe and positive use of the app (Nisa, 2023). Both studies highlight the potential of YouTube and YouTube Kids as valuable tools for early childhood education, but emphasize the need for parental guidance and teacher training to maximize their benefits.

The research focus trend on the topic of language ability was conducted twice. This trend-focused research on the topic of language skills was conducted twice. First author Research on the influence of visual media on the development of language skills in early childhood has been the focus of several studies. Recent studies have focused on the impact of visual media on the language development of young children. One such study, conducted by Tarigan (2022), investigated the effectiveness of using picture cards to enhance the expressive language skills of 5-6-year-olds at BEZALEEL Kindergarten in Kuta Mbelin Village. This study specifically targeted BEZALEEL Kindergarten as the research site. The research employed a quantitative approach with an experimental design. Researchers compared children's language skills before and after being exposed to picture card media. Data was collected through observations and analyzed using the Wilcoxon signed-rank test, which is appropriate for ordinal data. The analysis revealed a significant improvement in the children's expressive language skills following the intervention of using picture cards. The Wilcoxon signed-rank test yielded a p-value less than 0.05, indicating a statistically significant difference between pre- and post-intervention scores. Based on the findings, it can be concluded that using picture cards is an effective method for enhancing the expressive language skills of 5-6-year-old children. Visual aids like picture cards can be engaging and effective tools for teaching language to young children. Therefore, the use of picture cards is highly recommended in kindergarten settings. (E. M. M. B. Tarigan, 2022). The second author Nurhayati (2023) studied the effect of using flashcard media on children's language skills. The population in this study were all students in group B at ABA 06 Kindergarten Medan in the 2021/2022 Academic Year consisting of two classes, namely the Mawar class as the experimental class and the Lotus class as the control

class. The type of research used in this study is to use a quantitative research method (testing) through a pseudo form, in the Posttest Only Control Design illustration. This study was conducted using two classes that have the same characteristics, namely class B1 (Rose) using flashcard media and class B2 (Lotus) using letter card media. Determination of class samples was carried out randomly with a sample size of 13 children in each class. The results of this study indicate that language skills in children aged 5-6 years increased after using flashcard media. Language skills in the experimental class increased more than language skills in the control class. This can be seen from the average of the experimental group of 3.46 while the average of the control group was 2.86 with a difference of 0.6. The test results show that the use of flashcard media has a significant influence on children's language skills with > namely 6.5 > 4. Thus, it can be concluded that there is a significant influence of the use of flashcard media on the language skills of children aged 5-6 years at ABA 06 Kindergarten Medan in the 2021/2022 Academic Year (Nurhayati, 2023). Research focus trends on flash card media written by Nurhayatun (2023).

Research focus trends on Science Learning Planning and Learning and Creativity written by Limbong (2023) aims to find out how to design and implement science learning designs that have been prepared by teachers; at TK Negeri 1 Pembina Tanjung Morawa. The type of research used is descriptive research with a qualitative approach. The results of the study indicate that planning in science learning is in accordance with the learning planning that should be, namely planning based on the 2013 curriculum, paying attention to course identity, material to be delivered, tools and materials needed, opening, core and closing learning activities to being able to make a final assessment design for learning. The implementation of Natural Science (IPA) learning at TK Negeri Pembina Tanjung Morawa has been running according to the plan that has been prepared. Each stage of learning, starting from preparation before the activity, opening activities, core activities, to closing activities, has been carried out well. This can be seen from the results of observations of the ongoing learning process. Science learning activities carried out at the kindergarten have followed the applicable guidelines. All stages of learning, including introductory, core, and closing activities, have been carried out systematically. Thus, it can be concluded that the implementation of science learning in TK Negeri Pembina Tanjung Morawa has met the established standards. In its implementation, teachers also apply science learning in: 1) observing, 2) comparing, 3) classifying, 4) measuring, and 5) communicating which have been applied in early childhood science learning (Limbong, 2023).

4   Conclusion

Emerging trends include keywords such as speech delay, smartphone impact, collage, YouTube applications, language skills, flash card media, learning planning, science learning, and creativity. Conversely, keywords like rhythmic gymnastics, emotional intelligence, employment status, gross motor skills, verbal linguistic abilities, audiovisual media, rewards, cognitive abilities, beading, funmath, arrangement, indoor learning environment, collage activities, and children's creativity were more prevalent in research prior to 2020.

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