



## RESEARCH ARTICLE

## The Refresher Course of the Organizational Competency to Scientific Activities For Ethnic Preschool Teachers, Its Contents, Methods And Influencing Factors

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ARTICLE INFO	ABSTRACT
Received: Apr 24, 2024	<p>Scientific activities (SAs) in school settings have been more important than ever especially for preschool teachers who have been teaching the early children to be more intelligent by involved into scientific activities. This research aims to discovery the contents and methods of refresher course of organizational competency to scientific activities for preschool teachers in ethnic minority areas and its influencing factors. The findings show that the contents and methods of the refresher course help learners improved their competencies and by mastering these competencies, the quality education in the preschool settings will considerably be enhanced. The refresher course should be further studied in terms of application into varied conditions and comparison between other groups of preschool teachers are different from those are teaching in minority areas, and many more scientific activities in schooling should be researched and these very young learners will get used to scientific activities in their daily life</p>
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### INTRODUCTION

Teachers in preschools in ethnic minority areas face many barriers to their professional practice and personal development. The lack of school facilities, pupils' weak Vietnamese language, children's families are poor, other disadvantages make childcare and education difficult, and expected results have not been achieved. In particular, the lack of facilities and training courses according to practical requirements in ethnic minority areas causes preschool teachers in these areas to have so few opportunities to improve their skills, professional competency in general, and competencies to organize scientific activities in particular. Additionally, preschool children in ethnic minority areas, due to certain barriers and poor learning resources, also show shyness and reluctance to communicate. This makes educational and scientific activities in general ineffective. In general, the refresher course on organizational competency to SA of preschool teachers has been carried out in many different forms, initially achieving certain results, but that has not been carried out consistently, totally, and has not really achieved effectiveness.

In the preschool education program, SAs are one of the activities that play an important role in helping children expand their awareness and increase their understanding of the world around them. With its own characteristics, SA is considered an attractive activity, with great significance in evoking and stimulating children's curiosity and desire to learn. At the same time, it lays the foundation for children's comprehensive development. SAs, in essence, are not entirely a new field, but on the

contrary, it has been researched in many different aspects. For preschool children, SAs "is *the process of children actively participating in exploration and learning about the natural world. It is the process of observing, comparing, classifying, testing, predicting, inferring, discussing, solving problems, and making decisions.*" (Tran & Nguyen, 2015). Therefore, this is a process-based activity in which the teacher will be the one who guides and helps to encourage children to reveal their competencies through a series of activities to explore and discover new things. At the same time, it helps children better understand the world around them. On that basis, SA act as a factor in nurturing and developing essential skills in preschool children. Although it is one of the important activities at the preschool level, SA is not aimed at helping children learn difficult academic scientific knowledge, and this is just an activity to help children have the opportunity to experience and explore things and phenomena close to their lives. Therefore, the top requirement for science activities at the preschool level is to provide children with a necessary, simple, but accurate system of knowledge about the world around them.

### **Research on competency and competency development for teachers**

The firstly, studies of preschool teachers' competencies. Bronfenbrenner's (1994) ecological model of human development affirmed that competency standards are a set of knowledge, skills, abilities, behaviors, and personal characteristics that can be measured and observable, contributing to an individual's success in specific areas related to professional practice. According to Wandersman (2006), competency is understood as "the skills, motivation, knowledge, and attitudes necessary to implement innovation, existing at the individual, organizational, and community levels." The structure of competency includes a system of knowledge about that activity (knowledge about the structure and knowledge about the rules and procedures for performing that activity), a system of skills to perform that activity (defining skills), direction, implementation skills, testing and evaluation skills, implementation and change skills), and attitude (positive attitude, self-discipline, honesty, independence, creativity, interest in performing that activity, etc.). (Do et al., 2018). Based on Bronfenbrenner's competency framework and guidance documents from UNESCO and SEAMEO (2016), preschool teachers can demonstrate competency through four contents: 1) knowledge of teaching content, pedagogical practice, and assessment; 2) learning environment 3) participation and collaboration; 4) professional development. Accordingly, Ho & Digvijay (2021) believe that the professional competency of preschool teachers is expressed through qualities and abilities such as love for work, love for children, and the need for further learning to nurture and adapt to educational innovation. Meanwhile, Nguyen, T.H., et al (2019) identify professional competency standards for preschool teachers, including the following: teacher quality; professional development; building an educational environment; developing relationships between school, family, and community; using a foreign language (or ethnic language); IT applications; and artistic talent in nurturing, caring for, and educating children.

When researching the role and factors affecting the competency of preschool teachers, many studies emphasize that the personal competency of preschool teachers has a direct impact on the quality of child care and education. (Hall et al., 2015). Therefore, future early childhood education research should promote sustainable competency developing for early childhood education teachers and administrators (Heidi & Roland, 2020). Bronfenbrenner's (1994) ecological framework for human development also clearly shows that teachers have an important influence on children's development and vice versa. This two-way relationship will create a premise for improving children's competency and that of preschool teachers. In addition, a number of studies have also shown factors affecting the professional development and competency of preschool teachers, such as training programs, the remuneration policies of the school, and the teachers themselves. (Yang et al., 2005; Shiyi & Rongfang, 2013); working environment in preschools (Chen, 2007); correlation between qualifications and

quality of preschool teachers (Fan et al., 2019). The self-learning competency of preschool teachers (Ho & Digvijay, 2021).

**Secondly**, research into competency development for teachers. To achieve children's educational goals, teachers need to have a number of competencies, such as soft skills and social and emotional competencies (Kayani et al., 2011; Kanokorn et al., 2014), integrated competency and artistic competency (Ahn & Seo, 2013; Kim, 2016) and competency to apply information technology in organizing educational activities (Fan et al., 2019). Digital competencies (Sillat et al., 2017). This is completely consistent with Brofenbrenner's competency framework, as it points out that preschool teachers need to participate in professional development programs as well as specific training programs throughout the development process of their jobs. Teachers must continuously study to update their knowledge and professional skills. Besides, they also need to be trained to be able to self-evaluate, develop themselves, and proactively make positive changes during their work process (Brofenbrenner, 1994). For preschool teachers in mountainous and disadvantaged areas, it is necessary to develop the competency to apply information technology and, at the same time, help them realize the importance of innovating educational programs (Bolstad, 2004; Li & Ping, 2019). Some other studies have also pointed out solutions to develop the professional competency of preschool teachers but have only mentioned general solutions for urban and lowland teachers without paying attention to support solutions for teachers in mountainous areas and ethnic minority teachers (Early et al., 2007; Liang, 2013). A few solutions to develop the professional competency of preschool teachers in mountainous areas have been implemented with great effort but have not been highly effective (Ho & Digvijay, 2021).

### **Research on scientific activities in preschools**

*The first is research on the role of SAs for preschool children and factors affecting the effectiveness of scientific activities.* Dogru (2012) has demonstrated that scientific activities are an effective technique for helping children acquire basic concepts related to "Earth, Sun, and Moon" as well as having a positive impact on the development of existing concepts in children. Furthermore, early science experiences are believed to be important for school readiness and lay the foundation for future learning (Brenneman, 2011). Additionally, early engagement in science stimulates the development of children's self-concepts as science learners and participants in the scientific process (Mantzicopoulos & Samarapungavan, 2007). However, the problem is that science in preschool classrooms often does not receive enough attention. The main problems that teachers often encounter in organizing scientific activities in preschools are: lack of teaching materials, too many children, poor facilities, and a lack of connection with students and children's parents (Dogan & Simsar, 2018). Children's language and communication are limited (Simsar, 2021), and teachers are not familiar with the basic knowledge that preschool children have about scientific concepts and learning, the reasoning skills that children possess, and the potential limits of those skills (Brenneman, 2011). This creates barriers to the effectiveness of organizing scientific activities. According to Sackes & Mesut (2014), the number of courses a teacher has attended, the availability of relevant teaching materials, and the teacher's perception of children's learning competency have an impact on the frequency of organizing specific SA at school. Research results by Oppermann, Brunner, and Anders (2019) show that teachers' beliefs in their own competency are closely related to female children's motivation, while teachers' practices are related to male children's motivation. In the same opinion, Barenthien (2020) also believes that the specific scientific competencies of preschool teachers also have a direct impact on the development of children's scientific competencies. These findings reinforce the arguments of previous studies, confirming that teachers' competency plays an important role in scientific activities in preschools.

*Second, research on methods and forms of organizing SA.* Dogan & Simsar (2018) studied preschool teachers' views on science education, the SA they carry out, the methods and techniques they use, as well as the problems they face when organizing SA in preschools. The results show that teachers often use methods such as experiments, observations, and presentations more than other methods when organizing scientific activities. Among them, the experimental method is determined to be the method children like the most and is easy to apply. Similarly, studies by Simsar (2021) also demonstrate that the use of experiments is completely suitable for the current situation of children's limited scientific language skills. Andiema's (2016) research investigates the impact of child-centered approaches in organizing scientific activities in preschools. The study concluded that using child-centered methods has a positive effect on the effectiveness of preschool children's acquisition of science skills. On the other hand, Bulunuz (2013) shows that providing children with scientific knowledge through play experiences is an important approach to promoting preschool children's understanding of science and technology's scientific concepts. Meanwhile, Dejonckheere et al. (2016) proposed three stages of organizing scientific activities for preschool children, including introduction, discovery, and activation. Through the research results obtained, Pendergast (2017) proposed that it is necessary to add more methods to evaluate the effectiveness of organizing scientific activities in kindergarten classes, as well as the impact of professional development on preschool teachers' attitudes, beliefs, and practices.

### **Research on fostering competency to organize scientific activities for preschool teachers**

Teachers play an important role in scientific activities in preschool. Therefore, providing learning opportunities can promote specific science competencies necessary for preschool teachers' science teaching (Barenthien et al., 2020). The findings in the study by Pendergast et al. (2017) show that preschool teachers may feel more comfortable integrating science activities as well as understanding the benefits of science for children's development. Similarly, Sundberg & Ottander (2013), based on research results, said that although competency and confidence are growing, many teachers are still not proactive in scientific activities. Helping teachers understand the purpose, meaning, and content of organizing scientific activities is of great significance for improving their initiative. Walan & Chang (2014) investigated the competencies and needs related to organizing scientific activities of preschool teachers. The results show that although teachers have quite good self-efficacy, they cannot meet the increasing demands of education. Therefore, training to improve the competency of preschool teachers is very important. On the other hand, Melville, Fazio, Bartley, and Doug (2008) investigated the relationship between teachers' perceptions and experiences to determine their competencies while also examining the challenges associated with organizing scientific activities in kindergarten classes. On that basis, the authors propose that teachers with average ability can participate in appropriate classes to improve their competency. Maier et al. (2013) argue that preschool teachers' attitudes and beliefs toward scientific activities are rarely specifically considered because this field lacks valid and reliable measures. Therefore, it is necessary to research tools to evaluate teachers' attitudes and beliefs about this activity.

In general, there are many studies on competency and competency development for preschool teachers, as well as scientific activities in preschools. However, the issue of fostering the competency to organize scientific activities for preschool teachers in general has only just begun to be researched, so there is still a gap in research on the issue of fostering the competency to organize activities that systematically promote scientific activities for teachers in ethnic minority preschools.

## **1. Materials and Methods**

The survey aims to clarify the current refresher course of organizational competency for the scientific activities of teachers in preschools in ethnic minority areas in Thai Nguyen province. Based on the results of the investigation, establish a practical basis for developing measures to refresh the course of organizational competency in scientific activities for teachers of preschools in ethnic minority

areas in Thai Nguyen province. Main contents: the current competency to organize scientific activities of teachers of preschools in ethnic minority areas in Thai Nguyen province; the current refresher course of the organizational competency to scientific activities for teachers of preschools in ethnic minority areas in Thai Nguyen province. Participants are 500 teachers in a number of preschools in ethnic minority areas in Thai Nguyen Province in September 2023, using questionnaires to assess the current refresher course of the organizational competency for scientific activities. The questionnaires include 14 questions, structured into two groups, including: teachers' awareness of the competency to organize scientific discovery activities; and a refresher course on the organizational competency to scientific activities for preschool teachers in ethnic minority areas.

**Table 1 Characteristics of Study Participants**

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	500	2.052	.6886541	1	3
Nationality	500	2.568	1.727236	1	7
Education attainment	500	2.858	.4221284	1	4
Working experience	500	2.786	1.018961	1	4

Table 1 summarizes the data on the characteristics of preschool teachers participating in a learning refresher course on scientific activities. These characteristics include age, nationality, education attainment, and working experience, with data collected from 500 observations for each variable.

The average age category of participants is around 2.052, indicating that the majority of the teachers fall into the middle age category defined by the study. The minimum and maximum values for age are 1 and 3, respectively. The standard deviation is 0.6886541, suggesting that the ages are quite closely clustered around the mean, with little variation.

Nationality scores for participants have an average of 2.568, with values ranging from 1 to 7. This broad range points to a significant diversity in the nationalities of the participants. The standard deviation is 1.727236, reflecting substantial variability in the nationality data. Participants' educational attainment levels show an average score of 2.858. This suggests that most participants have a higher level of education within the scale defined by the study, likely close to the higher end. The minimum and maximum values for education attainment are 1 and 4, respectively. The standard deviation of 0.4221284 indicates that the education levels among participants are fairly similar, with little variation. The average working experience score among participants is 2.786, showing that preschool teachers generally have moderate to high levels of working experience. The working experience scores range from 1 to 4, with a standard deviation of 1.018961. This moderate standard deviation indicates some variability in the working experience among the participants.

Overall, the data reflects that the preschool teachers participating in the refresher course are typically middle-aged, come from diverse nationalities, possess relatively high educational attainment, and have moderate to extensive working experience. There is more variability in nationality and working experience compared to age and education attainment, suggesting a more uniform distribution for the latter two variables.

### 3. RESULTS AND DISCUSSION

#### 3.1 The contents of refresher course of organizational competency for the SAs of teachers in preschools in ethnic minority areas

**Table 2**The retraining methods

The contents	Obs	Mean	Std. Dev.	Min	Max
<b>1. Knowledge</b>					
1.1. The goal of SA	500	3,532	1.025221	1	5
1.2. Content of SA	500	3,606	1.026094	1	5
1.3. Methods of organizing SA	500	3.44	1.075506	1	5
1.4. Form of organization of SA	500	3,356	.9224781	1	5
1.5. Structure of SA	500	3.33	.8640562	1	5
1.6. Factors affecting the organization of SA	500	3,386	.9179811	1	5
1.7. Natural and social sciences	500	3,376	.9446739	1	5
<b>2. Skills</b>					
2.1. Plan SA	500	3.39	.9314694	1	5
2.2. Building an environment to carry out SA	500	3,434	.8962424	1	5
2.3. Organize SA	500	3,362	.8720533	1	5
2.4. Evaluate the organization of SA	500	3,352	.9580876	1	5

Table 2 provides information about the refresher course on scientific activities for preschool teachers, which includes a comprehensive set of topics aimed at enhancing both knowledge and skills. The data collected from 500 observations for each item provides insights into the effectiveness of the course.

### Knowledge Components

The first area covered is the knowledge component, which encompasses several key topics. The goal of scientific discovery activities has a mean score of 3532 with a standard deviation of 1.025221. This indicates that most participants have a clear understanding of the goals of such activities. Similarly, the content of scientific discovery activities has a mean score of 3606 and a standard deviation of 1.026094, reflecting consistent comprehension among the teachers.

The methods of organizing scientific activities have a mean score of 3.44 and a standard deviation of 1.075506, suggesting some variation in understanding, though generally within a close range. The form of organization, with a mean of 3356 and a standard deviation of 0.9224781, and the structure of scientific activities, with a mean of 3.33 and a standard deviation of 0.8640562, indicate that the teachers have a uniform grasp of these concepts. Additionally, factors affecting the organization of scientific activities and the natural and social sciences both have mean scores of 3386 and 3376,

respectively, with standard deviations around 0.9, showing a solid and consistent understanding among the participants.

### **Skills Components**

The course also focuses on practical skills, with several key areas measured. Planning scientific activities has a mean score of 3.39 and a standard deviation of 0.9314694, indicating that teachers generally have similar abilities in this area. Building an environment to carry out scientific activities has a higher mean score of 3.434 and a lower standard deviation of 0.8962424, reflecting a slightly more consistent skill level among participants.

Organizing scientific activities shows a mean score of 3.362 with a standard deviation of 0.8720533, while evaluating the organization of these activities shows a mean score of 3.352 with a standard deviation of 0.9580876. These figures suggest that the teachers possess a uniform level of skill in both organizing and evaluating scientific activities.

Obviously, the refresher course provides a well-rounded education in both the theoretical and practical aspects of scientific activities for preschool teachers. The close mean values and low standard deviations across both knowledge and skills components indicate a consistent and uniform learning experience. This consistency suggests that the course is effective in standardizing the knowledge and skills of the participants, ensuring they are well-prepared to implement scientific activities in their teaching.

The refresher course on organizational competency for SAs for preschool teachers in ethnic minority areas

Every year, preschool teachers participate in professional training courses organized by the Ministry of Education and Training or the Department of Education and Training. Through studying the regular training program for preschool teachers and the training plan for the last 3 years, it was found that the annual regular training topics for preschool teachers of the Ministry of Education and Training focus heavily on developing professional knowledge and updating issues on the content and methods of organizing child rearing, care, and education activities in preschools.

Based on the concepts of training and competency to organize activities in the professional activities of teachers, the contents of training and competency to organize activities for teachers include:

#### **(1) Knowledge about organizing scientific activities for preschool children**

- The goals of SAs for preschool children
- The content of SAs for preschool children according to each age
- The methods of organizing SAs for preschool children
- The forms of organizing SAs for preschool children
- Training helps teachers understand the structure of teaching and learning activities in preschools.
- Provide training for teachers to be able to identify factors that affect teaching and learning activities in preschools.

- Basic knowledge of the natural and social sciences related to the scientific activities of children in preschool

**(2) The competency to plan SAs for preschool children**

- Choose the main topic and content of the SAs.
- Determine the goals of SAs.
- Determine the content of SAs.
- Plan SA with children

**(3) The competency to develop an environment to carry out SAs**

- Select and arrange learning objects for SAs.
- Making teaching and learning aids for SAs
- Mobilize materials, utensils, and toys from many different sources (parents, colleagues, and the and the community) for SAs.
- Building a positive psychological environment for children in SAs

**(4) The competency to organize SAs for preschool children**

- Perform the steps in the activity in the correct order, with appropriate timing.
- Ask questions and encourage children to ask questions during the activity.
- Guide and create opportunities for children to explore and experience activities.
- Observe children during activities and adjust activities flexibly.
- Stimulate children's interest, positivity, and initiative in activities.
- Select and use appropriate technology and visual aids.

**(5) The competency to evaluate the organization of SAs for preschool children**

- Evaluate the process of children's behavioral development activities.
- Evaluate the results or products of children's educational activities.
- Create opportunities for children to self-evaluate their child's learning activities.
- Create opportunities for children to self-evaluate the results of activities or products of creative activities created by them.

**(6) A positive attitude for teachers in planning and implementing teaching activities for preschool children**

- The teacher's interest in planning and organizing educational activities for preschool children
- A positive attitude in planning and organizing SA for preschool children



- Encourage teachers to regularly and proactively learn and improve knowledge and skills related to organizing SA.

### 3.2 The methods of refresher course of organizational competency for the SAs of teachers in preschools in ethnic minority areas

**Table 3 The methods**

	Obs	Mean	Std. Dev.	Min	Max
1. Discuss	500	3,498	1.071584	1	5
2. Presentation by experts	500	3,276	.8445416	1	5
3. Practice, experience	500	3,752	.9488396	1	5
4. Visit and learn from experience	500	3,248	.769207	1	5
5. Self-improvement	500	3,338	.8586213	1	5

Table 9 provides details on the methods used in a refresher course on scientific activities for preschool teachers. The data encompasses five different methods, each evaluated based on 500 observations, to understand their effectiveness and preferences among participants.

The discussion method has a mean score of 3498 and a standard deviation of 1.071584. This high mean indicates that discussions are a significant component of the refresher course and are well-regarded by the participants. The standard deviation suggests a moderate variation in how this method is perceived or utilized, highlighting its importance in fostering interactive and engaging learning environments. Presentations by experts have a mean score of 3276 and a standard deviation of 0.8445416. This method is also a vital part of the course, though slightly less emphasized compared to discussions. The lower standard deviation indicates a more consistent appreciation or use of this method among participants. Expert presentations likely provide authoritative insights and structured knowledge that complement the interactive discussions.

Practice experience stands out, with the highest mean score of 3752 and a standard deviation of 0.9488396. This suggests that hands-on practice is the most valued method in the course, highlighting its importance in the learning process. The standard deviation indicates a relatively uniform agreement on its effectiveness. This method's high valuation underscores the crucial role of experiential learning in solidifying theoretical knowledge through practical application. Visits and learning from experiences have a mean score of 3248 and the lowest standard deviation of 0.769207 among the methods. This implies that while this method is useful, it is less prominent compared to practice experiences and discussions. The low standard deviation reflects a high level of consistency in how this method is viewed or implemented. It suggests that experiential learning through visits is a well-accepted approach, though not as central as direct practice or expert guidance.

Self-improvement has a mean score of 3338 and a standard deviation of 0.8586213. This method is also valued and shows a moderate variation in its application among participants. It indicates that while self-directed learning is important, it is less emphasized than practice experiences and

discussions. The consistent yet slightly lower emphasis on self-improvement highlights the course's structured approach while also encouraging individual growth and continuous learning.

The refresher course on scientific activities for preschool teachers employs a variety of methods, with hands-on practice, discussions, and expert presentations being the most prominent and valued. Practice experience, with the highest mean score, indicates its critical role in effectively imparting knowledge and skills. Discussions and presentations by experts also play significant roles, providing theoretical and practical insights. Visits and self-improvement, while still important, are slightly less emphasized but contribute to a well-rounded educational approach. Overall, the data reflects a balanced and effective blend of interactive, experiential, and self-directed learning methods to enhance preschool teachers' competencies in scientific activities.

### **Method of exchange and discussion**

This is a method of raising problems to help preschool teachers discuss and self-answer in groups, with experts answering... This method creates conditions for teachers to contribute personal opinions and experiences in developing program content and innovating child care and education methods. When using the discussion method, it is possible to organize for learners to watch video clips and discuss ways to implement a teaching and learning activity; point out the advantages and limitations of the methods; find ways to implement activities effectively;

### **Practical and experiential methods**

As a method for preschool teachers to practice planning and organizing SA in situations or giving different types of exercises, preschool teachers apply knowledge and experience to complete word exercises. That improves the competency to organize SA for preschool children. This method can be applied to: (1) preschool teachers practice and apply the knowledge and skills they have learned to organize a number of teaching activities at preschool. From there, preschool teachers can record clips of themselves or their colleagues during SA, review, and share. (2) Write down your comments and assessments about a promotional activity that you have organized or a promotional activity that you have attended; Give comments and group discussions to see the good and bad sides.

### **Expert presentation methods**

This is an expert method that provides basic theoretical knowledge about organizing SA, and experts are people with an in-depth understanding of a field of presentation and reporting. On that basis, it helps teachers accumulate new knowledge and skills based on existing knowledge and skills. However, for the presentation method to be effective, it needs to be combined with a number of other methods to increase learner initiative.

### **Method of visiting and learning from experience**

This is a method for taking preschool teachers to visit and learn from the experiences of schools and early childhood education facilities that do well in organizing preschool activities for kindergarten children. By observing a number of teaching activities at kindergartens, observing and identifying the skills of organizing teaching activities of preschool teachers in practice, and observing children's expressions during the activities, teachers can evaluate and recognize the advantages and limitations of the activity. Organizing discussions to draw lessons from visiting and learning from experience is an important step that cannot be overlooked.

*Self-training method:* It is a method that attracts and guides teachers to be positive, proactive, and creative in learning with the help of documents and audio-visual media, always discovering and exploring, not being rigid, restrictive, or stereotyped according to what is in the documents. Competence is a structure in human psychology, formed in activities, depends largely on each individual's experience, and cannot be acquired overnight. To make rapid progress, it is necessary to have a focused, regular training process for each individual. Therefore, the training is essentially just a few touches on the path of developing the competency to organize scientific activities for preschool teachers. To improve this competency, teachers are required to train themselves in many different ways: (1) self-read documents on various mass media (books, magazines, the internet, etc.); (2) self-practice, experience what you know, and put into practice organizing outreach activities for children in preschool; (3) actively discuss and share with others (colleagues, experts, relatives, etc.) about what is known and unknown;

When using training methods, attention should be paid to: (1) Scientific training methods must be used to change the awareness, attitude, and behavior of teachers in teaching and learning activities. (2) The school creates necessary conditions and a working environment suitable to the professional characteristics of caring for and educating children of preschool age; there are reasonable regimes and policies to encourage teachers to actively and voluntarily participate in learning, fostering, and training to improve their competency to organize teaching activities. The subjects of the training are teachers—those who have certain experience in child care and education activities—so the training method must be flexible, suitable to the working conditions of teachers, and aim to increase self-esteem, teachers' learning and self-research based on guidance on self-exploitation on different information channels. Currently, exploiting advances in science and technology in training activities is encouraged.

**3.2.The influencing factors of refresher course of organizational competency for the SAs of preschool teachers**

**Table 4 The influencing factors**

Factors	Obs	Mean	Std. Dev.	Min	Max
1. Preschool teachers' awareness of SAs	500	3,992	.7701443	1	5
2. Teachers' existing skills in organizing SAs	500	3.99	.8290202	1	5
3. Attitudes and motivations of preschool teachers when participating in training	500	3,902	.8589946	1	5
4. Competency of training staff		3,962	.8544098	1	5
5. Facilities for training	500	4.02	.8838339	1	5
6. Policies and management mechanisms for preschool teachers	500	3,904	.8510185	1	5

This study explores several key factors that influence the learning of scientific activities by preschool teachers. The data encompasses responses from 500 preschool teachers, examining their awareness, skills, attitudes, and the conditions of their training environment. The factors analyzed include teachers' awareness of scientific activities, their existing skills, their attitudes and motivations during training, the competency of the training staff, the facilities available for training, and the policies and management mechanisms in place for preschool teachers.

### **Teachers' Awareness of Scientific Activities**

The mean score for preschool teachers' awareness of scientific discovery activities is 3992, with a standard deviation of 0.7701443. The minimum and maximum values recorded for this factor are "first" and 5, respectively. This high mean score indicates a strong general awareness among preschool teachers about scientific discovery activities, which is crucial for fostering a positive learning environment for young children.

### **Existing Skills in Organizing Scientific Activities**

Teachers' existing skills in organizing scientific activities have a mean score of 3.99 and a standard deviation of 0.8290202. Similar to the awareness factor, the skill levels vary from "first" to 5. This suggests that while many teachers possess adequate skills, there is still variability, indicating room for improvement through targeted professional development programs.

### **Attitudes and motivations during training**

The attitudes and motivations of preschool teachers when participating in training have a mean score of 3902, with a standard deviation of 0.8589946. The scores range from "first" to 5. This data shows that teachers generally have positive attitudes and motivations toward their training, which is essential for effective learning and the application of new scientific teaching methods.

### **Competency of Trainers**

The competency of trainers, an important factor in the effectiveness of teacher training programs, has a mean score of 3962 and a standard deviation of 0.8544098. This range from "first" to 5 demonstrates that the quality and capability of training staff are generally well-regarded, but there may be inconsistencies that need addressing to ensure uniformity in training quality.

### **Facilities for training**

Facilities for training received a mean score of 4.02 with a standard deviation of 0.8838339. The range is from "first" to 5, indicating that most preschool teachers find the facilities adequate for their training needs. However, the variability suggests that not all training environments are equally well equipped, highlighting the need for improvements in certain areas.

### **Policies and Management Mechanisms**

Policies and management mechanisms for preschool teachers have a mean score of 3904 and a standard deviation of 0.8510185, with scores ranging from "first" to 5. This indicates that while there are policies and management structures in place, their effectiveness and implementation might be inconsistent, affecting the overall support system for preschool teachers.

Overall, the analysis of these factors highlights the strengths and areas for improvement in the professional development and support of preschool teachers in the context of scientific discovery activities. The data suggests that while there is a solid foundation in terms of awareness, skills, and motivation among teachers, there are variations in the quality of training staff, facilities, and policy implementation that need to be addressed to ensure a consistently high standard of scientific education in preschool settings.

## **Preschool teacher factors**

Teachers' awareness of the competency to organize teaching activities: In addition to life and professional experience in general, the knowledge that teachers are trained in related to the field of teaching has an impact on their competency to organize activities when this knowledge is personally comprehended and transformed into themselves. In addition, teachers' correct awareness of the role and meaning of fostering competency to organize teaching and learning activities will have a great influence on the effectiveness of this activity. In addition to scientific knowledge and professional skills as the foundation for forming the competency to organize scientific research activities, skills such as observation skills (facial expressions, gestures, facial expressions, behavior, etc.), listening skills, self-control skills, etc. will more or less affect the competency of preschool teachers to organize daily activities for children.

## **Teacher's positivity and initiative**

A teacher's initiative has a great impact on the effectiveness of training activities. Proactivity helps teachers explore and discover new problems, helping teachers understand the nature of the problem in the deepest way. In particular, positivity will also contribute to helping teachers consolidate knowledge, practice qualities, and skills to organize promotional activities in the best and most effective way.

## **Preschool teachers**

Individual attitudes and motivation have a very important influence on competency development. Training to improve the competency to organize SA will be ineffective and wasteful if learners do not have the desire to improve this competency for themselves. The attitudes and motivations of child care teachers that influence the fostering of competency to organize teaching and learning activities in the process of child care and education are: caring attitude, inquisitive attitude, and active learning to improve personal competency, motivation/desire to improve competency to improve oneself, and reputation before the group.

Preschool teachers professional standards are a system of qualities and competencies that teachers need to achieve to carry out the tasks of nurturing, caring for, and educating children in preschool educational establishments. Accordingly, teachers must master preschool pedagogical expertise, regularly update and improve professional competency and pedagogical skills to meet the requirements of educational innovation, and organize activities to nurture, care for, educate, and comprehensively develop children according to the preschool education program. Thus, the professional standards for child care teachers set out requirements for child care teachers to be able to perform well in child care and education activities. Professional standards for preschool teachers provide professional competencies in the professional competency system as a basis for orientation for fostering and developing professional competencies for preschool teachers. SAs are an educational activity within the Early Childhood Education program, so to organize this activity, teachers need to have an appropriate professional competency system.

## **Organization of training**

The organization of training plays a key role in training activities and is the factor that covers all remaining factors. In cases where all other conditions have been prepared at a relatively good level but the organization is not scientific, it will affect the training results. During the training process, if

more time is spent for learners to discuss and practice in a directed manner, new skills will be formed more quickly and firmly. On the contrary, if during the training process, the training staff has not set aside time for students to discuss and debate to deepen the content of the lecture, nor have they organized for students to write tests or harvest, or spend too little time practicing, this will more or less affect the quality of training. Therefore, if you want training to be good, you need to have a detailed and clear plan.

### **Competency of trainers**

The competency of the training staff, which includes knowledge, professional skills, and the ability to organize activities for teachers to gain practical experience to gain knowledge and form skills, is a factor that directly affects them. to the process of fostering the competency to organize scientific promotion activities for preschool teachers in preschools in ethnic minority areas. To foster the competency to organize scientific promotion activities for teachers, the training officer must have management competency to be able to build activity plans, organize, direct, inspect, and evaluate the activities of the preschool teachers. On that basis, foster teachers with a system of knowledge and skills to organize appropriate teaching activities. If the training staff does not have professional competency, as well as a poor ability to guide and organize training activities, it will limit the effectiveness of training activities for child teachers.

### **Facilities**

Facilities and technical equipment are the main conditions and means to carry out training activities. Quantity and quality of classrooms serving training in terms of area, lighting, temperature, tables, chairs, projectors, etc. according to specifications and equipment for training (quantity and quality of teaching equipment for lecturers and students to use such as computers, computer software, projectors, learning materials, stationery, etc.) are considered basic conditions for training. When these facilities are lacking, although training activities can take place, they will not be as effective as expected.

## **4. CONCLUSIONS**

For preschool education, educational activities are expressed in a variety of forms. Each activity, depending on the goal, can be organized in a separate way. Therefore, preschool teachers need to have the competency to organize educational activities. The competency to organize educational activities is the ability to flexibly and organize the knowledge, skills, attitudes, and emotions of teachers to effectively carry out educational activities for children at preschool. This competency is important for preschool teachers, as it not only helps preschool teachers organize activities well but also helps teachers easily implement the goals of the preschool teacher program.

The competency to organize scientific activities of preschool teachers is a combination of many component competencies, such as: knowledge of organizing scientific activities; to plan scientific activities; to build an environment to carry out SA; to organize scientific activities; to evaluate the organization of SA; and positive attitudes for teachers in planning and implementing scientific activities. Although these component capacities (skills) exist relatively independently, they are closely related to each other, forming the general competency of preschool teachers in organizing scientific activities.

Fostering the competency to organize scientific activities for preschool teachers is aimed at improving the quality and professional competency of preschool teachers, helping them consolidate

and update their knowledge and skills and professional expertise to be able to organize effective scientific discovery activities. In particular, fostering the competency to organize scientific discovery activities for preschool teachers in ethnic minority areas is important for improving the quality of child care and education in this region.

There are many factors that affect the effectiveness of fostering the competency to organize scientific activities for preschool teachers in ethnic minority areas. Among them, factors such as preschool teachers, requirements for professional standards of preschool teachers, organization of training, competency of training staff, facilities, etc. are the factors that have the most obvious influence.

### Authors' Contributions

Anh Thi Thuy Truong designed the project and wrote the manuscript. Dung Minh Ngo conceived the idea. Thang The Nguyen participated in the design and helped in writing the manuscript. All authors read and approved the final manuscript.

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### Questionnaire

We are conducting research on the scientific topic of "The refresher course on organizational competency to scientific activities for preschool teachers in ethnic minority areas in Thai Nguyen province". To have practical information to help the research process, we invite teachers and staff to participate in answering the questions in this form.

We commit that the information teachers and teachers provide will only serve scientific research and will not be used for any other purpose.

Teacher, do you agree to participate in the research?

Agree  Disagree

If you agree to participate in the study, please read the instructions below before answering the questionnaire:

- For questions without a table, the teacher should circle the number of the answer options that match your opinion.

- For questions with a table, the teacher marks (x) the answer option that matches your opinion.

#### A. PERSONAL INFORMATION

**A1. First and last name :** .....

Code	A2. Nationality	A3. Year old
1	KInh	20-30 years old
2	Tay	31-40 years old
3	Knife	over 41
4	Nung	
5	San Diu	
6	San Chi	
7	Other	

**A4. Name of the kindergarten you are working at :**  
.....

**A5. The area where the teacher/teacher is working**

1. Dinh Hoa 2. Vo Nhai 3. Dai Tu 4. Phu Luong 5. Dong Hy

**A6. Training level :**

1. P  
 edagogical School 2. Pedagogical college 3. University 4. Postgraduate

**A7. Years of work:**

1. Under 5 years 2. From 5-10 years 3. From 10 – 15 years 4. Over 15 years

**B. CONTENTS**

**B1. During your work, have you ever heard the phrase "fostering the competency to organize scientific discovery activities"?**

1. Very often 2. Often 3. Occasionally 4. Rarely 5. Never

**B2. Teachers, what do you understand by "Fostering competency to organize scientific discovery activities"?**

1. Is the process of adding knowledge and skills to help teachers improve their ability to organize scientific activities.
2. Is the process of adding, updating knowledge, and practicing skills related to organizing SA in kindergartens , contributing to improving the effectiveness of organizing SA in kindergartens.
3. Is the process of adding, updating knowledge, and practicing skills related to organizing SA in preschools to improve the competency to recognize, organize and evaluate the results of SA, helping teachers organize outreach activities for preschool children more effectively.

**B3. Please tell us the necessity of fostering the competency to organize SA for preschool teachers in ethnic minority areas?**

1. Very necessary 2. Necessary 3. Somewhat necessary 4. Not very necessary 5. Not necessary at all

**B4. According to you, what is the purpose of fostering the competency to organize SA for preschool teachers in ethnic minority areas?**

No	Purpose
1	Helps improve the efficiency of SA
2	Help preschool teachers update, supplement, knowledge and skills in organizing SAs
3	Improve the quality and professional competency of preschool teachers
4	Contribute to realizing the goals of the Early Childhood Education program
5	Help teachers meet the requirements of professional standards
6	All of the above purposes

**B5. What is the contents of fostering the competency to organize SA for preschool teachers in ethnic minority areas?**

No	Content	L				
		5	4	3	2	1
<b>1. The knowledge about organizing SAs</b>						
1.1.	The goals of SAs					

1.2.	The content of SAs					
1.3.	The methods of organizing SAs					
1.4.	The forms of organizing SAs					
1.5.	The structure of SAs					
1.5.	The factors affecting the organization of SAs					
1.6.	The natural and social sciences					
<b>2. The skills in organizing SAs</b>						
2.1.	Planning SAs					
2.2.	Developing an environment to carry out SAs					
2.3.	Organizing SAs					
2.4.	Evaluating the organization of SAs					
<b>3. A positive attitude towards organizing SAs</b>						
3.1.	The children's interest in planning and organizing SAs					
3.2.	The positivity in planning and organizing SA					
3.3.	A regular attitude, proactively learning and cultivating knowledge and skills related to organizing SA					

Notes: 5-Strongly agree; 4- Agree; 3- Normal; 2- Disagree; 1-Strongly disagree

**B6. According to you, what methods should be implemented?**

No	Methods	I				
		5	4	3	2	1
1	Discussion					
2	Expert presentation					
3	Practical and experiential activities					
4	Experiential learning tour					
5	Self-training method					

Notes: 5-Strongly agree; 4- Agree; 3- Normal; 2- Disagree; 1-Strongly disagree

**B7. In what ways should be implemented?**

No	Content	I				
		5	4	3	2	1
1	On-site training					
2	Research lessons in preschool					
3	Regular training					
4	self-study and self-research					

Notes: 5-Strongly agree; 4- Agree; 3- Normal; 2- Disagree; 1-Strongly disagree

**B8. What factors will be influenced on training organizational competency to SA for preschool teachers in ethnic minority areas?**

No	Factors	Level				
		5	4	3	2	1
1	Preschool teacher’s awareness of SA					
2	Preschool teacher 's available skills in organizing SA					
3	Attitude and motivation of teachers when participating in training					
4	Competencies of training staff					
5	Facilities for training					
6	Policies, regimes and management mechanisms for preschool teacher					

Notes: 5- Very influential; 4- Influence; 3- Little impact; 2- No impact; 1- Very unaffected

**B9. How often you participate in fostering the organizational competency to organize SA at different training units as follows?**

No	Training unit	Level				
		5	4	3	2	1
1	Provincial Department of Education and Training					
2	District Department of Education and Training					
3	The kindergarten					

4	Others				
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**Notes:** 5- Very often; 4- Regularly; 3- Occasionally; 2- Rarely; 1- Never

**B10. What are the advantages and disadvantages of participating in these activities?**

**The advantages**

1. Be given conditions to participate in training activities fully and effectively
2. There are many detailed instructions documents
3. Training content is appropriate and easy to understand
4. Adequate physical facilities, meeting training activities

**The disadvantages**

1. Receiving little support from colleagues and school administrators
2. Lack of guidance documents on fostering competency to organize scientific activities
3. Training content is difficult to understand and less relevant
4. Training methods are little or ineffective
5. At the same time, I have to take on many other jobs so I cannot concentrate on training activities
6. Not being able to flexibly apply the content being trained into educational activities
7. Other : .....

**B11. To improve the efficiency of these training activities, what should trainers do?**

- 1.....
- 2.....
- 3.....