

RESEARCH ARTICLE

The Role of Video-based Noticing in Science Activities in the Context of Professional Development: Opinions and Experiences of Preschool Teachers

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ABSTRACT

This research aims to examine the noticing practices of preschool teachers on the basis of authentic videos for science activities in the context of professional development. For this purpose, noticing practices were carried out with three preschool teachers through authentic video containing six science activities. As part of these practices, online reflective interviews were conducted with the participants over the situations they noticed in the videos (What/Who Did I Notice? How Did I Notice?). At the end of the application process, online semi-structured interviews were conducted regarding the participants' experiences in the process of noticing video-based science activities. As a result of the content analysis of the interviews, two themes were reached as science activities and the role of noticing practices in professional development. Detailed findings on the categories and codes produced within the scope of this theme are discussed within the framework of the literature. As a result of the research; reveals that authentic video-based recognition practices in science practices have important experiences for preschool teachers both in science activities and in terms of professional development.

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1. Introduction

At an early age, all children have the capacity and inclination to observe and explore their environment National Research Council (NRC, 2012). Current research shows that young children have the capacity for conceptual learning and the ability to use reasoning and inquiry skills when investigating how the world works (NRC, 2007; NRC, 2012). These are essential skills for science learning that can be encouraged and supported among children in their first years of life. The National Association of Science Teachers (NSTA, 2002) emphasizes that learning science applications in the early

years can increase children's curiosity and propensity to explore the world around them, and can lay the foundation for effective science learning, both at later levels and throughout their lives.

Teachers have a central and important role in helping children learn science. Daily life is rich with science experiences; Adults can best contribute to children's science learning by transferring these experiences into their lives. (National Association for the Education of Young Children (NAEYC), 2013). In this sense, it is important for teachers to support children's play and direct their attention, structure their experiences, support learning initiatives, and regulate the

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complexity of their knowledge level (NRC, 2007). NSTA (2023). Recommends that teachers who support children's learning in any early childhood setting understand the value and importance of nurturing young children's curiosity and provide experiences that focus on the content and applications of science in the early years. In this direction, it is clear that preschool teachers need to improve their professional competencies in science education within the framework of changing pedagogical understandings.

Changing the teaching profession over time requires teachers to adapt to these changes. Research has revealed that teachers' undergraduate education is not sufficient throughout their professional life (Baş, 2013; Özer, 2008) and they need professional development for individual or system-related reasons (Nolan & Molla, 2018). The purpose of professional development studies is to improve teachers' professional practices, beliefs and students' understandings of learning (Griffin, 1983). Therefore, professional development studies have critical importance in the professional empowerment of teachers (Borko et al., 2011). Research has revealed that professional development studies provide significant benefits in teachers' classroom practices, attitudes and beliefs, and students' learning outcomes (Barnhart & van Es, 2015; Emery, 2021; Guskey, 2002; Villegas-Reimers & Reimers, 2000). These practices enable teachers to gain an inquiring perspective (van Es et al., 2014), renew themselves, keep up with the developing and changing world, increase their interest in their profession, and make more successful practices in the classroom (Baş, 2013; Borko et al., 2011; Özer, 2008; Sabuncuoğlu, 2016). However, it is criticized that traditional professional development programs, which are carried out as one-day workshops and infrequent in-service sessions, do not meet the needs of teachers by national standards (Korthagen et al., 2006). In this respect, it is seen that it is important for the teacher to participate in professional development studies with more in-depth and contemporary methods in accordance with the professional feature or content that he wants to improve himself.

"Teacher noticing" is one of the leading studies supporting current and effective professional development, which provides the opportunity to observe, interpret and evaluate teachers' classroom practices with different techniques. Jacobs et al. (2010) defines professional awareness as paying attention to learners' strategies, interpreting their understanding, and deciding how to respond to them.

In the General Competencies of Teaching Profession directive, it is stated that with the code of "knowing the student", the teacher should have full knowledge of the student's characteristics, interests, wishes and needs, and the socio-cultural and economic characteristics of the family and the environment (Ministry of Education (MONE), 2006). Barnhart and van Es (2011) emphasize the importance of

vocational training on Teacher Awareness in helping teachers focus more on children's thoughts, get to know them better, and increase the quality of the education provided.

There are many methods used in awareness studies (van Es et al., 2014). Watching lesson/activity videos shot in a live classroom environment is one of the most effective ones (van Es & Sherin, 2002). Lesson videos can be in the form of videotaping of the lesson applications made by the teachers themselves or lesson videos taken in the classroom environment where another colleague is practicing (Seago et al., 2018; Sherin et al., 2011). Pre-taken lesson videos for the purpose of the right way have an important place in acquiring basic professional skills such as observation, interpretation and transfer to the profession (Estapa et al., 2018; Grossman et al., 2009; Jacobs et al., 2010; Star et al. Strickland, 2008; van Es & Sherin, 2008; Wang & Hartley, 2003).

When the existing studies on teacher awareness are examined; those for teaching mathematics are more common (Baki & Kilicoglu, 2023; Choy, 2016; Erdik, 2014; Jacobs et al., 2010; Sherin & Russ, 2011; Star & Strickland, 2008; Stockero, 2014; van Es et al., 2022).

However, in studies on teacher awareness in science contexts, the effect of lecture videos on teachers' professional awareness skills (Emery, 2021) and the contribution of interviews made after novice teachers' course experiences to science education and professional development (Benedict-Chambers, 2016; Russ & Luna, 2013) on the other hand, it is noteworthy that there are limited studies on teacher awareness in preschool. It allowed men to watch the lesson videos taken in the educational environment as a group and interpret them with reflective interviews. As a result of the study, it was stated that collective dialogue in teacher professional development contributed positively to professional development and teacher awareness. Speldewinde et al. (2021) gives place to their opinions on their awareness in non-learning environments. Study findings demonstrated the learning and development benefits that teachers derive from engaging in noticing practices.

In light of the theoretical framework, the aim of this study is to examine the opinions and experiences of preschool teachers who participated in the awareness studies of video-based science applications. It is known that vocational training on "Professional Noticing" (Teacher Noticing) helps teachers to focus more on children's thoughts, get to know them better, and increase the quality of the education provided (Barnhart & van Es, 2015). For this purpose, the research question examined was as follows: what are the views and experiences of preschool teachers who participate in video-based science practices noticing practices?

2. Materials and Methods

This research was conducted based on a descriptive phenomenological approach. The purpose of descriptive phenomenological research is claimed to be to determine participants' experiences of the phenomenon and to make sense of these experiences (Moustakas, 1994; van Manen, 2014). Consistent with this definition, this study aimed to explore the common experience of preschool teachers' practice of noticing based on science activity videos. In this context, themes based on the definitions and interpretation of the experiences of those who experience the phenomenon are revealed through interviews. In line with phenomenology, researchers sought to understand (1) what participants experienced and (2) how they experienced the phenomenon (Moustakas, 1994).

2.1. Study Group

The study group consists of three preschool teachers with different years of experience selected via purposeful sampling method. Purposeful sampling method is a method consisting of participants who are related to the subject to be studied and meet the criteria (Yağar & Dökme, 2018). The criteria were determined based on the researchers' conceptual framework: i. the participants did not participate in awareness studies, lesson study and video-based professional studies, ii. that the participants did not participate in a science and science activity-based educational study, iii. the participants did not participate in postgraduate and doctoral studies. A study group was formed based on the relevant criteria, since previous participation in postgraduate studies as a part of professional experience and awareness practices will affect how participants describe and make sense of their experiences. In our study, pseudonyms were given to protect the privacy and ethical values of the participants.

2.2. Data Collection Tools

2.2.1. Authentic science activity videos

These videos were used to engage participants in reflective interviews based on an authentic learning environment in a real preschool classroom where science activities were held. Six videos were used in the study, which were previously shot and included science activities that different teachers applied in their preschool classrooms. Each of these videos, which are approximately 15 minutes long, focuses on a different science concept or subject. These science activities focus on the topics or concepts of microbes, floating bodies, friction and electricity generation, rain formation, rainbow formation and weather balloons.

In order to prevent the participants from gaining familiarity with the environment over time and to diversify their awareness, the activity videos include different classes, teacher and student communities.

2.2.2. Semi-structured interview form regarding their experiences in the process

It is the final interview form made after the pre-interview at the beginning of the research and the six-week activity video-watching process. There are nine questions evaluating the science activities, the video-based noticing study process and the first interview process where their views on science activities were taken. With this form, teachers' opinions on science activities at the end of the process were obtained.

2.3. Data Collection Process

Participants first watched the Authentic Science Activity videos within the scope of Teacher Awareness practices. They took notes of the situations they noticed in the video, including the dimensions appropriate to the conceptual framework (What/Who Did I Notice? How Did I Notice?). After examining the notes that the participants took based on the videos, the researchers conducted reflective interviews online about the situations they noticed in the event videos. This process continued with different activity videos for six weeks. After these applications, online semi-structured interviews were conducted with the participants regarding their experiences in the process of noticing video-based science activities and their interpretation of these experiences. The data of this research were obtained from Semi-structured Interviews for the Experiences of the Process, which were conducted with the participants at the end of the video-based teacher recognition practices.

2.4. Analysis of Data

In the analysis of the data obtained from the semi-structured interviews with the participants, the inductive content analysis method was used to describe and make sense of their experiences regarding the phenomena of "science activities" and "the role of discernment in professional development". Inductive content analysis is carried out to reach previously undefined themes of a qualitative study (Kyngäs, 2020). Accordingly, basic inductive content analysis is performed according to the following stages: data reduction, data grouping, and generation of concepts that can be used to answer research questions (Yıldırım & Şimşek, 1999). Within the scope of this research, throughout the analytical process, the researchers carefully compared the similarities and differences between the coded data, and organized categories, concepts, and themes to reveal them.

2.5. Reliability

In order to increase the reliability of our research, the inter-rater reliability method was used. In this method, it enables two or more researchers to independently encode the obtained qualitative data and make comparisons. In this method, intercoder consistency should be above 0.80 (Creswell, 2016). The data obtained from the interviews with the participants

within the scope of the research were coded independently by two researchers. As a result of the comparison between the participants, it was seen that the consistency rate between the coders was 0.90.

3. Findings

Two main themes were determined as a result of the inductive content analysis of the data obtained from the participants through the Semi-structured Interview Form for their experiences on the process: “science activities” and “the role of noticing in professional development”.

Categories and coding within these themes are given in Table 1 and Table 2.

3.1. Science Activities Theme

The definition of science activity related to the theme of “science activities”, the learning environment in science activities, the role of the teacher in science activities, what was noticed in science activities, the frequency of application of science activities and codes are given in Table 1.

Table 1. Findings on the science activities theme.

Category	Code
Description of science activity	Fun / enjoyable Remarkable Intriguing Striking Facilitating learning Offering lasting experience Discovery and research process Activities that provide observation Associated with daily life
Learning Environment in Science Activities	Available materials Security measures taken Seating arrangement that allows observation Enabling active participation
Teacher Role in Science Activities	Open to innovation Willing to implement different activities Directory Identifying the student role Providing guidelines
Student role in science activities	Asking questions to the teacher Answering teacher's questions Acting according to the teacher's instructions
The effect of science activities on children	Enhances their creativity It offers the opportunity to explore its surroundings It encourages research Makes children feel good/happy It is useful to concretize abstract concepts. Gives a critical view

When Table.1 is examined; the codes of the features emphasized by the participants in their definitions of science activities are seen. For example, Ayşen teacher explained the science activities based on the videos she watched: *“In my opinion, science activities are an important activity that children participate in by having fun and being surprised. It is a type of activity that is easy to learn because it was about experimentation, so there was learning by doing. It is one of the most permanent and enjoyable events.”* He pointed out the fun, surprising, facilitating learning and lasting experiences of science activities. In addition, teacher Ayşen stated that, unlike art and reading activities, which she frequently used, science activities based on videos had extraordinary and remarkable features. Similarly, Meryem Teacher has defined science

activities for children as *“Science activities are a process of discovery and research that arouses curiosity for children and enables them to make observations”*. Özden, on the other hand, defines science activities as “the activities in which children can embody abstract situations and associate concepts with daily life” at the end of the process of noticing applications based on the videos he watches. *“It is very important to reconcile it with daily life. Today's child is also bored with cut, paste and paint. Children are more curious about the things they apply in daily life.”* According to these definitions, it is seen that each participant emphasized that after video-based noticing applications, science activities differed from other activity types in terms of being remarkable.

The findings indicate some codes regarding the learning environment in the science activities of the participants: accessible materials, an environment with safety precautions, and a seating arrangement that allows observation. Ayşen teacher emphasized that at the end of the practices, there should be "accessible materials" in providing a suitable environment for science activities. Ayşen Teacher's statement is as follows: "First of all, an environment where the teacher can work comfortably should be provided. You can easily obtain materials. Then when the teacher is willing to do it, everything is ready for the setting". Teacher Meryem, on the other hand, mentions that group or individual seating arrangements can be made in line with the structure of the class and the activity: "If it is not a crowded group, they should sit around the table in a way that everyone can observe. In individual events, materials should be in front of them. But science activities are usually group activities. That's why it's most important to sit in a way that everyone can see and observe." Similarly, Özden teacher suggested an environment where safety precautions were taken and pointed to an environment where children can actively participate and observe easily. He explained his opinion on this issue as follows: "All security measures must be taken. If possible, active participation of children should be ensured... There should be a place where children can observe. If the class size is small and easily accessible materials are available, several mechanisms can be set up. It may be more appropriate for children to do the activities themselves". According to these views, it is seen that the organization of the learning environment is emphasized according to the active participation and observation of children in the science activities of the participants.

When the views on the roles of teachers in science activities are examined, it can be said that the participants have adopted different understandings. These roles are coded as being open to innovations, willing to implement different activities, guide, determining the student role and giving instructions. In this context, the researcher asked the participants what the teacher does/what should he do in science activities? What roles does it take? He directed his questions. In response to this question, teacher Ayşen said, "...If teachers are open to different activities, everything will be okay...Teachers should be open to innovations. They shouldn't be stuck like me. The reason why I am like this is because the children in my village have language problems. Since we want to at least form the basis of language for the next stages, science activities can stay in the background." He replied as the dialogue between the Meryem teacher and the researcher is given as follows:

Meryem T.: *The teacher is the person who guides more. If there is no danger, a method in which students explore more and is guided by the teacher may be better.*

Researcher: *I will ask you to define guidance. What kind of guidance is this?*

Researcher: *What does the teacher do as a guide?*

Meryem T.: *Starts an experiment, gives instructions.*

Similarly, Özden Teacher also emphasizes the codes of teacher roles that determine the role of guide, directive and student. Regarding this, "The teacher should be a guide depending on the situation. You can give them instructions and have them do it themselves. These can also vary from event to event. At least the student can help. I am not a fan of the teacher doing one-on-one and the students watching in any activity. The more they are in it, the more permanently they learn." Accordingly, the participants stated the student roles in science activities as asking questions to the teacher, answering the teacher's questions, and acting according to the teacher's instructions.

Participants talked about the effects of science activities on children such as "improving their creativity, providing the opportunity to explore their environment, encouraging them to explore, making them feel good/happy, helping to embody abstract concepts". For example, Özden teacher said, "Science activities are a simple way for children to learn permanently. It serves to make something more abstract concrete for them". Mary Teacher, on the other hand, used the following statements regarding the subject: "Science activities are very important in pre-school, as they lead children to research and discover and attract their attention. This leads them to explore more. It arouses more curiosity and can bring a critical approach."

3.2. Professional Development Theme

The sub-themes, categories and codings reached regarding the opinions of the participants on professional development in line with their experiences in the process of noticing video-based science activities are presented in Table 2.

When the findings in Table 2 are examined; it is seen that the participants made sense of their experiences of video-based noticing practices within the scope of the theme The Role of Video-Based Awareness in Encouraging Professional Development, within the framework of the categories of self-examination, seeing alternative practices, encouraging updating pedagogical and field knowledge, and encouraging updating their future plans.

As part of the self-examination category, Ayşen Teacher thinks that it is more effective to meet the expectations of the school administration rather than the pedagogical components such as the interests, needs and achievements of children while making educational decisions at the beginning of the study process, that this situation has changed in the video-based awareness study process, and her thoughts on the instructional decisions she has made. expressed. Ayşen teacher's statements about this are as follows: "I have always worked focused on what branch managers expect from us. Already this year, I was able to work properly because there was a pandemic when I

was first appointed. This year, I am glad that I have done this work. Next year, I will ignore the expectations of the branch managers a little bit. I will turn to the activities of my own field.” Ayşen Teacher, who defines herself as an 'angry' teacher, made the following statements regarding the code of "realizing the importance of emotional control in order to have a positive attitude towards students" after seeing the 'calm' and 'loving' nature of a teacher in the videos she watched: "These are also shortcomings. I can get angry more quickly as a structure. I was very envious of Öykü teacher, whose experiments I liked, to the students and her friendly approach. Looking at that teacher a little bit, I saw that I could be a little more patient and give calm answers. I do my self-criticism in this direction and I try to behave in the same way in the classroom”.

Meryem Teacher, on the other hand, stated that she should include science activities more frequently at the end of the study process regarding the codes of "encouraging updating future plans" and "recognizing that simple and accessible materials can be used" as part of the "self- examination" category expressed in these words: "I thought that I should give more space to science activities, I was already lacking in this regard.

I thought I couldn't do a lot of science activities. While I was able to do art and math activities much more, I was given less space to science activities because I couldn't reach the materials or because it required preparation. I thought to include more science activities because it engages children and arouses curiosity. I took an example because I saw from the videos that it also led to research and discovery.”

Özden Teacher emphasized the categories of "seeing alternative applications" and "encouraging updating of pedagogical and content knowledge" as follows: "Science activities were presented to children in different forms in the videos. "I can present it that way too." I said. "This is how it can be done." or "It hadn't occurred to me." the things I said. ... He encouraged me to research what can be done in science activities and what can be done better. I was more interested in the experiments, which did not have much material, since I was in a village school. It gave me a lot of ideas.” Similarly, Meryem Teacher stated that the experiences she gained during the working process encouraged her personal development and gained awareness for different situations: "It allowed me to learn and research about science experiments. It made me think about things to do.”

Table 2. Findings on the professional development theme.

Category	Code
Self-examination	Noticing that pedagogical components are ignored in instructional decisions
	Noticing the need to broaden the teaching purpose
	Noticing that simple and accessible materials can be used
	Noticing the importance of emotion control in order to have a positive attitude towards the student
Recognizing alternative approaches	Noticing that you don't do science activities often enough
	Noticing the Types of Activity
Encourage updating of pedagogical and field knowledge	Researching science activities and how to apply them
	Swing to science activities that offer rich experience
Encourage updating future plans	Encourage updating future plans

4. Discussion and Conclusion

This study aims to address how teachers make sense of their experiences of noticing practices on the basis of authentic science activity videos. For this purpose, with the guidance of the researchers, the participants made awareness practices through authentic science activity videos. At the end of these practices, the participants' experiences with the process were discussed with semi-structured interviews. As a result of the inductive content analysis, two main themes were reached: science activities and professional development. Within the scope of the theme of science activities, the participants expressed their views on categories such as the definition of science activities, the learning environment, the role of teacher and student, and their effects on students. For example, while describing science activities, they often emphasized the fun,

surprising, intriguing features of science activities for children, the discovery and research process, and the features that facilitate learning. When the literature is examined, these features of science activities are mentioned in many studies. Büyüktaşkapı (2010) states that children can access a lot of information for their daily lives through research and discovery when they do science activities in the pre-school period. Science activities based on observation and experience and providing real-life experiences to children make significant contributions to children's conceptual development (Yalçın & Tekbıyık, 2013). Similar to the findings of the current study, Sığirtmaç and Özbek (2011) revealed that teachers mostly think that young children are curious about learning scientific concepts and events.

It was observed that the participants emphasized that accessible materials were frequently used while describing the

learning environment in science activities. When we look at the literature, it is noteworthy that the materials used at the beginning of the subjects that preschool teachers care most about and have problems with in science activities (Aslan et al., 2015; Barbaroğlu & Metwalley, 2018; Karamete Gözcü, 2019; Okura & Okur Akçay, 2021; Sığirtmaç & Özbek, 2011). Considering the current research findings; In previous studies, it can be said that the thought that the materials that preschool teachers see as an obstacle to the implementation of science activities are easily accessible in science activities, and that authentic video demonstrations stretch teachers' views on the applicability of science activities.

When the views on the roles of teachers and students in science activities are considered; It was noteworthy that the participants expressed both teacher-centered and student-centered elements. For example, when we look at the teacher roles that determine the student role and give instructions, and the student roles that respond to the questions and act according to the directive, it is understood that in science activities, each stage is planned and explained step by step in accordance with the traditional education approach rather than the constructivist approach. When the studies conducted in parallel with these views are examined, it is seen that the science activities applied in preschool education are based on the traditional approach (Ayvacı et al., 2002, Büyüктаşkapu, 2010; Dağlı & Dağlıoğlu, 2020; Sığirtmaç & Özbek, 2011).

Within the scope of the theme of science activities, it was seen that the views of the participants on the effects of science activities on children were in line with the research findings in the literature. When the researches are examined; As emphasized by the participants, it is seen that science activities improve children's research and discovery skills (Ayvacı, 2010; Tatar et al., 2007). At the same time, as emphasized by the participants, science activities increase children's active interaction with the environment and support concept development through concrete experiences (Aktaş, 2006; Ayvacı, 2010; Üstün & Akman, 2003). When considered in terms of creativity, which is another code; It has been claimed that children's creativity is related to asking questions and trying different ways while engaging in an activity (Charles & Kolvoord, 2003; Grainger & Barnes, 2006). In this sense, it can be said that children's experience through research and questioning during science activities can be effective in the development of creativity.

Within the context of the theme of professional development, which is among the findings of the study, there are categories of self-examination, seeing alternative practices, encouraging updating of pedagogical and field knowledge and encouraging updating of future plans. Within the scope of the self-examination category, the participants had the opportunity to review their professional deficiencies by comparing the teaching practices in the video with their own practices. These

findings show that video-based noticing practices improve teachers' reflective skills. As stated in the literature, in line with the videos that teachers watch, their teaching practices enable them to see important events that they had not noticed before in sufficient time, in contrast to the fast pace of education, and to adopt different perspectives (van Es, 2011; Sherin et al., 2009). In line with these self-examination, the participants expressed their views in the categories of seeing alternative practices in science activities, encouraging updating of pedagogical and field knowledge and encouraging updating their future plans. When these opinions are examined in detail; They emphasized that the participants were aware of various science activities, they were willing to research and practice how to apply them, and they planned to develop their teaching practices in this direction. In line with these findings, it is possible to say that noticing practices on the basis of authentic videos on science activities support teachers' professional development. In this regard, Darling-Hammond et al. (2017) stated that using effective practice models including video-based teaching situations gives an idea about what teachers want to achieve and how they can do it. In this sense, it is known that professional development programs using such practice models are effective in discovering effective practices of teachers and supporting student success (Özdemir Baki, 2023). However, when we look at the characteristics of the most effective professional development, it is seen that providing feedback and reflection is an important component (Marsh & Mitchell, 2014). It allows to improve assessment skills (Tripp & Rich, 2012), to increase teaching motivation and to improve classroom practices (Gaudin & Chaliés, 2015; Major & Watson, 2018). In particular, it can be said that the encodings for the self-examination category of the participants represent the views developed through reflective practices. Zwozdiak Myers (2012) defines these practices as an inquiry that includes the process in which teachers revise and restructure their actions, beliefs, and knowledge towards teaching for the purpose of professional development. As a result of the awareness practices, the participants' decisions to restructure their future teaching practices reveal the role of these practices in their professional development. Nagro et al. (2017) state that when teachers reflect on their lessons, they are more willing to try new approaches.

These research findings reveal that preschool teachers' authentic video-based recognition practices in science activities have significant experiences both in science activities and in terms of professional development. Although these practices seem to encourage teachers to review their own teaching processes and organize new teaching plans, it is thought that wider professional development practices are needed to develop a deeper understanding of teacher and student roles in science activities. It is difficult to change these understandings and practices of teachers in a professional sense. However, teachers who regularly monitor and reflect on their teaching

improve their teaching understanding (Aslan et al., 2022). In this context, it is recommended to consider these applications in cycles.

Compliance with Ethical Standards

This study was prepared in accordance with academic rules and ethical principles with the permission of the KASTAMONU UNIVERSITY RECTORATE Social and Human Sciences Research and Publication Ethics Committee dated 7.12.2021 (Document Verification Code: 74AAAD3).

Conflict of Interest

The authors declare that they have no conflict of interest.

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Supplementary Information

Semi-Structured Interviews Form on Their Experiences with the Process

(Final Interview)

The following questions have been prepared for you to evaluate the process of identifying the states of being aware of science practices.

1. How would you describe your experience of the video-based interviews we conducted within the scope of this study?

- How did you feel during these interviews? Explain with examples.
- How have these feelings and experiences affected your thinking about learning, teaching or teaching?

2. What can you say about the teaching profession, considering your experience?

3. Is there a difference between your view on the teaching profession before this process and your view at the end of the process? From where? Explain with examples

4. Have your thoughts about science (science) changed after this process? How?

5. When you think about the impact of this process, what do you think about science activities in early childhood?

- Do you think science activities in early childhood are important when you consider this process? From where?
- How should it be done?
- What kind of environment should it be?
- What should the teacher do?
- What should the student do? (Roles)

Have your thoughts on this subject changed in the process? Please explain.

At the end of the process, have there been any changes in your classroom practices in science activities as a teacher? Can you give examples from the classroom environment?

Have you changed your approach to science practices/activities? How did it affect you?

6. What were/were these situations that interested you the most? Do you see a change in the situations that you have paid attention to since the first meeting? Can you explain with an example?

7. What were your favorite aspects of the process? Explain with examples.

8. What were the situations that you did not like about the evaluation practices and interviews you made during the process? Did you have any problems during this process? How did you deal with this problem? Explain with examples