Introducing SFH (STEM From Home) through Webinar program: A descriptive study

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Abstract. The COVID-19 pandemic suddenly compels pupils to study from home. Primary school teachers face difficulties to present learning at home, even more parents who have a new role as a teacher at home. The purpose of the research was gaining parents and primary school teachers opinion on Webinar Program SFH (STEM From Home) as a stimulator to create fun and creative learning at home. It was a descriptive study with purposive sampling technique. The samples of the research were teachers and parents who needed creative learning references from home. The instruments were questionnaires and open-ended questions that investigated their opinion on the webinar program. The data were triangulated to gain comprehensive findings. The findings of the Webinar Program SFH are very important as a foundation for further research in carrying out fun and creative science learning from home. The results showed that primary school teachers and parents gave positive feedback to Webinar Program SFH. They gained a new perspective to present science teaching with fun and creative method although it is conducted from home.

1. Introduction

Online teaching and learning activities were implemented in various ways by schools during the Covid-19 virus pandemic. However, the implementation is considered not optimal and shows that there is still unpreparedness among educators in adapting to this digital climate [1-3]. One of them is that online learning in elementary schools has not been optimal. In fact, the education process should be carried out continuously even during a pandemic by adjusting the circumstances, one of which is through the use of various learning technology application platforms such as Edmodo, Google Classroom, Whatssapp and so on [4]. It is intended that the sustainability of educational programs for elementary school students continues to achieve learning objectives related to mastery of student competencies in a meaningful manner in the domain of knowledge, skills and attitudes [5].

The elementary school period is a period of forming the foundation of the ability to think and work through an educational process that requires a lot of attention and guidance from the environment around students. Both in normal learning situations even during the Covid-19 pandemic, this requires good collaboration between the school, in this case teachers, and parents / guardians of students in order to instill meaningful educational values for each individual student [6]. Parental participation is very important for the success of online learning. A dilemma situation then occurs when parents are unable to attend to accompany their children because they have to work, such as health workers, informal workers, factory workers, ranchers, fishermen and farmers both working from home and outside the
home. While they do not have other people who can help accompany the children while studying. Parents who have the opportunity to work from home but still prioritize work are also unable to help their children learn optimally [7,8]. Moving on from this phenomenon, various alternative methods and methods of learning are taken simply to get the best educational outcomes for all students in the current situation. One of the learning methods that can facilitate this is the project method through science learning which involves the integration of STEM (Science, Technology, Engineering and Mathematics) in it [9,10].

Learning science using current contexts combined with project assignments is one of the lessons that can build STEM literacy. In addition, contextual learning which is packaged with strategies and media and involves technology in learning will be able to create STEM literate students [11]. STEM literacy can bring students to interpret science as a whole, able to solve problems related to science and technology and engineering assisted by an understanding of mathematics. STEM literacy also leads students to become innovative and creative individuals. A person's innovation and creativity can be awakened if they are trained in creative thinking skills first, which are based on higher-order thinking, such as thinking rationally, critically and thinking creatively. STEM literacy has the potential to build people who are ready to face the 21st century which is full of challenges and competition, both at the national and international levels [12].

So far, STEM learning for elementary school students has been carried out through face-to-face mode. However, during a pandemic like now, of course this cannot be done. Teachers experience confusion in implementing STEM learning into an online learning activity platform for elementary school students [13]. As for the obstacle in implementing the implementation of online STEM learning for elementary school students is the lack of readiness of the teacher in organizing STEM learning without face to face, especially if learning is carried out using the project method. Relevant to this, the success of the learning process from home needs support and cooperation from parents, so teachers need to understand how to prepare STEM-based science learning that involves parents at home to support the successful implementation of this learning [9,10].

It has clearly been explained that the development of STEM-based learning cannot be separated from the ability of teachers to design and implement it in the classroom. Therefore, a professional training program to build teachers' skills in designing and implementing STEM learning is deemed indispensable. With the development of similar training, it is hoped that the ability of teachers in designing STEM-based learning will increase which is expected to have implications for student mastery in the four STEM fields. It should also be noted is the packaging of training programs so that they can be implemented optimally considering the policy of learning from home and working from home during the Covid-19 pandemic. Starting from this thought, an idea emerged to conduct a web-based seminar (Webinar) for teachers called SFH (STEM From Home). Furthermore, through this SFH learning, it is hoped that teachers can develop innovative STEM-based science learning and motivate elementary school students to be interested in learning and exploring the STEM field. This research seeks to reveal and explain the implementation of the webinar program (web-based seminar) and also the results of the evaluation of the SFH (STEM From Home) learning presentation activities.

2. Methods

This research uses descriptive research to determine the responses of the webinar participants in the form of teachers, lecturers and students to the implementation of the SFH (STEM Form Home) webinar program. This research was conducted at the Indonesian Education University Cibiru Campus in July 2020. The sampling method used was saturated sampling in which all members of the population were members of the sample. The samples in this study were all participants of the school from home webinar held in collaboration with PGPAUD and PGSD UPI Cibiru campus which was held on Wednesday, July 29 2020 at 13.00 - 15.30 WIB through the Zoom Meeting platform.
The research method used is descriptive. Descriptive research is research that describes or describes an event, condition, event, symptom, which is happening now which is described by the researcher as it is [13]. The data collection method used was a survey method using an attitude questionnaire on satisfaction and the effectiveness of the STEM From Home webinar activity. The questionnaire used is based on a Likert scale. The Likert scale is a research scale used to measure attitudes and opinions on the assessment of satisfaction and effectiveness of the STEM From Home webinar activity. Respondents were asked to complete a questionnaire which required them to indicate their level of agreement with the questions. The level of approval for the assessment referred to in this Likert scale consists of 4 scale choices, namely, (1) Very not good, (2) not good, (3) Good, (4) Very Good. The results of filling out the questionnaires that have been collected are processed using excel for further interpretation of the results of the data processing. The results of the evaluation of the SFH Webinar activities have produced a foundation for further activities in carrying out learning planning activities for science learning from home for the elementary school level. In this research, the steps taken can be divided into three stages, namely the pre-research stage, the implementation stage, and the post-research stage. The Pre-Research Stage is in the form of preparation of field study instruments, for example the preparation of observation sheet formats, interview formats and questionnaires. The Implementation Stage is in the form of data collection based on problem identification, including observation of the webinar implementation process, teacher interviews to find out teaching preparation during school policy from home, the results of evaluation of learning carried out during the Covid-19 pandemic. Giving questionnaires to participants to measure attitudes and opinions on satisfaction and the effectiveness of the STEM From Home webinar activity. The final stage is theory development based on the data obtained and report preparation.

3. Results and discussion

3.1. Analysis of webinar activity participants
The research has been carried out by distributing questionnaires online via the google form application and has been filled in by participants. The webinar participants who attended this activity were 398 participants. The professions and backgrounds of the participants who took part in the STEM From Home webinar can be seen in the diagram in Figure 2.
3.2. Assessment of the effectiveness of the STEM From Home Webinar

As an effort to facilitate creative learning as long as the school from home policy is implemented, the STEM From home webinar activity was carried out as an effort to broaden insights into STEM-based learning activities with the format of home learning activities. The purpose of conducting the STEM Form Home SFH webinar activity is that through this activity it is hoped that teachers can develop innovative STEM-based science learning and motivate elementary school students to be interested in learning and exploring the STEM field during the period when school from home is implemented. Broadly speaking, the seminar participants' responsiveness gave positive results and sought to have an interest in implementing SFH that was delivered into the learning preparation from home prepared by elementary school teachers. To be able to provide an overview of effectiveness, it can be reviewed in table 1 below.

Table 1. Recapitulation of questionnaire results for STEM From Home webinar participants.

| Category                                           | Very Bad (%) | Not good (%) | Well (%) | Very good (%) |
|----------------------------------------------------|--------------|--------------|----------|---------------|
| The suitability of the experts' fields of expertise presented in this webinar | 0.3          | 2            | 21.7     | 76.1          |
| The speaker's ability to motivate and activate webinar participants | 0            | 2.3          | 31.2     | 66.5          |
| How to respond to problems, questions or cases given by participants in the question and answer session | 0.3          | 1.8          | 27.7     | 70.3          |
| The slide used by the speaker                      | 0            | 2.8          | 26.2     | 71            |
| The approach / method of delivery used             | 0.3          | 1.8          | 34       | 64            |
| Overall Assessment                                  | 0.5          | 1.5          | 25.4     | 72.5          |
| Rating of this Webinar activity                    | 4.38         |              |          |               |

3.3. Discussion

Website-based seminars or often called webinars are modern era seminars based on internet networks. The webinar does not require an in-person meeting, but is only network-based. By not demanding in-
person meetings, webinars are possible to be held anytime and anywhere according to mutual agreement. Thus, it is possible to have participants from various locations without meeting up. Like regular seminars, webinars also require speakers as sources of information to be discussed. The main difference lies in the seminar participants, where participants do not have to be in the same room / location, but may be from several locations by being linked by a network (website). Apart from the location of the seminar participants, the discussion event was slightly different. In an ordinary seminar, participants can discuss directly with the speaker. But in the webinar, participants can only ask questions by typing in the column provided on the website in question [14]. From table 1, it can be seen that broadly speaking the seminar participants' responses gave positive results and tried to have an interest in implementing SFH that was delivered into learning preparation from home prepared by elementary school teachers.

It can be seen in the thickness of 1 category with the highest presentation in the field of conformity of the speaker's expertise with the material presented. Participants assumed that the speakers in the STEM from home webinar were competent in speaking according to their fields. However, it needs to be improved and improved in using approaches and methods in delivering material in the STEM From Home webinar activity.

Some of the comments from participants in the STEM From home webinar activities include the material they like the most, including examples of STEM approach applications that can be done from home, some links or science learning portals that can be integrated with the STEM from home approach, and overall comments about organizing the STEM webinar From home, among others, are gratitude for opening insights and knowledge about STEM that can be practiced even when learning from home. Participants hope that there will be a continuation of this webinar activity in the form of training or workshops to compile and carry out STEM From home learning in the form of a learning implementation plan that can be carried out on the road from home.

As for the supporting factors for the implementation of STEM From Home (SFH) is the learning from home policy that allows students to have more time to use skills and content knowledge to solve problems creatively. And the inhibiting factor in this implementation is the lack of careful preparation from the teacher in implementing SFH during the learning from home policy due to the dense tasks that the teacher needs to do, the lack of readiness of students to accept the SFH pattern because they are not in a school environment so the learning atmosphere is less supported, teacher confusion in preparing assessments that can be implemented in SFH implementation as long as the learning from home policy is implemented, and general constraints such as problems with internet connectivity between teachers and students in conducting SFH implementation guidance.

4. Conclusion
Based on the results of the research above, it can be concluded that in general the response of the seminar participants gave positive results and this activity has the motivation and interest to apply the SFH delivered by the speaker into the learning preparation from home prepared by elementary school teachers. As for the indicators of the effectiveness of the implementation of the STEM form home webinar activity, the suitability of the speaker's field of expertise, the ability of the speaker to motivate activating webinar participants, how to respond to problems, questions or cases given by participants in the question and answer session, the slides used by the presenters and the approach / delivery method used. As for the main suggestions from the participants, it is suggested to carry out direct training or training by means of seminars and workshops to develop plans for implementing STEM learning from home.

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