Natural experience approach in science learning: An impact study of socialization to the science teacher

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Abstract. This study aims to describe the results of the socialization of natural experience (jelajah alam sekitar, JAS) approaches on the learning held by science teachers’ members of MGMP IPA sub rayon 04 Kota Semarang through study of learning tools and testimony. This study is a case study that is intended to describe the results of the impact analysis of JAS learning approach socialization to the target audience mentioned above. The results of the study indicate that at the beginning of the activity before the socialization, 62.5% of the participants had known JAS and stated positive things about JAS, such as activating teachers and learners, making it easier to understand biology materials, fun and educate critical thinking students. They have also been able to assess the constraints found in learners, especially on time management. With the socialization of the participants can develop lesson plan and other learning tools that are considered relevant to JAS. Nevertheless, in the application of learning it is difficult to achieve the characteristics and nature of JAS on the use of alternative / authentic assessment, exploration of the surrounding environment, and a fun learning / bioedutainment. The results of reflection and evaluation show that many participants have not been able to change the mind set to view the object of biological study in learning from education about to education for. For that, in the future it is necessary activities that lead to best practice of learning management, classroom action research and collaboration.

1. Introduction

Musyawarah Guru Mata Pelajaran Ilmu Pengetahuan Alam (MGMP IPA) sub-rayon 04 Semarang City are organizations of non-formal science teachers formed in the framework of a means to share knowledge and discuss problems of natural science learning in their respective education units. The results of the interview with the Supervisory Agency Rayon 04, obtained information that this organization was experiencing saturated activities that had been discussing curriculum 13 with a predetermined learning approach. To overcome the boredom and desire to get another learning approach, namely the Jelajah Alam Sekitar (JAS). The JAS learning approach has been developed by the Department of Biology since 2005, and has been studied from various aspects which can ultimately be used as a reliable learning approach. This approach emphasizes style in delivering material which includes the nature, scope and procedures of explorative activities providing real experience to students. The JAS approach comprehensively combines various approaches including exploration and investigation, constructivism, cooperative learning process skills [1-4].

The JAS approach is a learning approach that utilizes the natural environment around the lives of students both physical, social and cultural environments as objects of learning biology whose phenomena are learned through scientific work [5,6]. This approach emphasizes learning activities that
are linked to real-world situations, so that in addition to opening up a variety of thinking perspectives from all students, this approach allows students to learn various concepts and how to relate it to real life so that learning outcomes are more effective for their lives.

T JAS approach basically adopts the concept of "iqro" which is reading what God created [2]. JAS is an alternative strategy in learning (biology) by inviting students to explore the environment to achieve knowledges, attitude and skills so that they have mastery of science and skills, work, and community [1,2,7].

The JAS learning approach in its implementation emphasizes fun learning. This is one of the components of PAIKEM which has an active, innovative, creative, effective and enjoyable learning environment created by the teacher. But in the JAS learning approach, the characters are fun, expressed exclusively in terms of ‘bioedutainment’ (from the word bio = biology; edu = education, and tainment = entertainment), which is a biology learning strategy that is entertaining and fun involving elements of science, the process of discovery or inquiry, work skills, collaboration, educational games, competition, challenges and sportsmanship [8,7]. Later [9] called bioeduentrpreneurship.

Based on the explanation above, the JAS approach is one approach that fits the characteristics of science learning whose object of study is nature with all its contents. The results of the tracer study, the application of the JAS approach in the learning process [3,10] obtained information that the JAS approach was implemented to compile 113 scientific works ranging from the most number of theses (81 works) or 71, 7% both stored in the library of Universitas Negeri Semarang (UNNES), Universitas PGRI Semarang (UPGRIS) and published online. While other scientific works in the form of theses and dissertations are 6 works (5.3%). The number of scientific works published online is in the form of 26 national articles and journals (23%).

Nevertheless, the implementation of the JAS approach at the education unit level showed that the JAS approach was implemented most in junior secondary education units (47%) and high schools (42%), and in the Biology Science subjects, as well as in the 8% Higher Education, while at the primary school level is only 3%. The minimum application of the JAS approach at the primary level is due to the lack of socialization of the JAS approach at the unit level [3,10]. The results of questionnaires filled out by respondents who have applied the JAS approach, one of the suggestions submitted is that the JAS approach will be better known if the Biology department / study program brings JAS to schools in the form of community service.

This article intends to describe the impact of the socialization of the JAS learning approach to science teachers on their views on contextual, collaborative, and fun science learning

2. Methods
The method used for problem solving can be seen in Figure 1.

![Figure 1. Problem solving method](image-url)
Furthermore, data on the results of the activity were analyzed descriptively in accordance with the study objectives.

3. Results and Discussion

The audience of participants who had heard about the JAS Approach was 62.5% and the remaining 37.5% said they had never heard. Based on the profile of participants who are alumni of the UNNES Biology Education Study Program and the S2 Science Program UNNES from biological concentration recorded 61%. The rest are graduates from other universities, Universitas Diponegoro (Undip), Universitas Kriten Satya Wacana (UKSW), UPGRIS. By looking at such compositions it is likely that those who have heard are those who are UNNES graduates. This is strengthened by where information about JAS was first obtained. Participants were more informed about JAS from other teachers (25%) and from UNNES biology lecturers (37.5%). The rest received information from alumni organizations, print media, electronic media, and practice program for prospective teacher students’ field experience. This is in accordance with the results of Ridlo and Ngabekti’s and their colleague’s tracer study [3,10].

JAS has been introduced by the Department of Biology for 12 years ago. The development of JAS is to answer the challenges of contextual, student-centered, active, creative, and fun learning. Learning that is affiliated to these things is still a very well-recognized learning model framework so that even though I do not know about JAS, as many as 81.25% of participants said they had invited students to explore the objects of learning science, even 12.5% stated often. The participants stated various benefits can be taken when inviting to explore the objects of learning science, especially biology that has specifications because it is related to living things that are three-dimensional in nature. The perceived benefits are making the teacher and students active (expressed by 62.5%), making it easier to understand the material (expressed by 56.25%), fun (expressed by 75%), and making students critical and asking lots of questions (stated by 62.5%). This is in accordance with the results of the study of [4,11]. The JAS approach affects the process skills and student learning outcomes [11]. The character and conservation-based JAS approach was effectively applied to improve student learning activities and outcomes [4]. Besides that, the participants stated that learning by object exploration will foster an attitude of gratitude, especially in respect of the gift of God Almighty in the existence of the universe, more familiar and loving the environment, and fostering an attitude of wanting to preserve nature. Even so, the participants felt that there were obstacles in carrying out exploration. The most obstacles are related to the needs and time management stated by 75% of participants. While other constraints that are considered to affect the success of successive exploration are problems of supervision of students, more teacher and student staff, funds that must be provided, tools and materials needed, and permits. In contrast to [4], the researchers did not feel there was a time management obstacle due to using the quantum method.

Constraints that are often encountered do not actually discourage teachers from facilitating students with exploration learning. The teachers stated several efforts that have been made to overcome these obstacles, namely to invite students to prepare tools and materials (25%), invite other teachers to collaborate (18.75%), do it outside of class hours and offer contribution students (12.5%), and using observers (6.25%). The efforts that have been made are including in the school program, doing it at least once a semester, doing it around the school, and inviting collaboration practice program for prospective teacher students’ field experience. [7] further suggested to recognize the epistemology and axiology of JAS, giving students flexibility to build ideas that emerged and developed after learning ended, students and teachers have a responsibility to create situations that encourage initiatives, motivations and responsibilities for lifelong learning.

Paying attention to the lesson plan produced by participants after being given a socialization of the JAS learning approach can be found as follows.

1. There is an effort from the participants to combine the knowledge of lesson plan development in accordance with the 2013 Curriculum. So that all participants appreciate by providing an assessment of the JAS approach is very suitable with the learning model suggested by the 2013
Curriculum, contextual and meets active, innovative, creative, effective and enjoyable learning environment created by the teacher.

2. Difficulties that are still encountered in developing learning structures are the problem of time management, evaluation, and how to realize the characteristics of JAS.

3. There were efforts by the participants to minimize the obstacles as revealed in the previous opinion survey which was illustrated from the learning tools, namely to invite observers to explore and increase the time outside of class hours.

4. Participants judge that they have to deepen English and master information technology and even require to follow the development of science and technology in education so that they can better understand JAS learning so that they can design their devices better.

After the socialization was held, the participant who stated that they applied JAS were 50% while the other 50% were doubtful whether they had actually implemented JAS so they stated that they were not fully. At the end of the activity, 62.5% of the participants had tried to repeat implementing JAS learning and the rest said there were plans to repeat it. As many as 87.5% of participants conducted learning for daily learning needs. Others for the purpose of further study and research.

Characteristics and nature of JAS that cannot be implemented and percent of participants who stated can be seen in Table 1.

| No | Characteristics and Nature of JAS | Amount (%) |
|----|----------------------------------|------------|
| 1  | Constructiveist                  | 12.5       |
| 2  | Science process                  | 12.5       |
| 3  | Inquiry                          | 37.5       |
| 4  | Natural environmental exploration around | 50.0   |
| 5  | Fun learning / bioedutainment    | 37.5       |
| 6  | Alternative / authentic assessment | 62.5   |
| 7  | Add meaning to learning to the person of faith in God Almighty | 12.5 |

Means that the most characteristic and nature of JAS cannot be implemented at most about alternative/authentic assessments and environmental exploration. This is like the results of a poll at the beginning of the activity. Possible causes are schools located in sub rayon 4 of Semarang City in the middle of a city that does not have open green land. This is evident from [11] research that applies outdoor learning to the use of the JAS approach. Authentic assessment also dominates things that cannot be implemented given the teacher's lack of knowledge of authentic assessment practices. The authentic implementation of the assessment should take into account financial problems, task design, and learning effects [12]. These three things were also felt by the respondents.

The exploration activities in the garden that were questioned by the participants still revolved around education about, such as "what is this plant?" "What are the benefits of this plant?" And other similar things. Participants have not asked for education for, such as blaming "why is the garden set up like that, what does it mean to educate?" Can you teach students to or how to set up learning with observations in this garden area? What characters can be expected to arise from exploration activities in the garden like this? This shows that participants still lack understanding of meaningful learning. Seems necessary self-directed exploration in order to obtain learning bonuses as disclosed by [13].

Questions from the dedication team about whether education tourism gardens should be maintained as forests or should they be arranged as parks? Coded participant answers are as follows. For learning biology, it is necessary to maintain the natural order, also need to add a collection of plants. For learning with observation, it is necessary to hear, see, feel, etc., the activities that have just been carried out cannot be seen by all activities in question. The call for a solution to overcome the scarcity of plant collections at UNNES education tourism gardens from one of participant by contacting the national park to ask for new plant seeds. Educational tourism gardens can be used for educational purposes. [9] explained that the existence of biology gardens can be used for contextual learning.
The question of the participants who were quite proud of the service team as 'host' was how to make use of public tourism gardens such as schools. The department has provided there are several ways that can be taken, but what is most pleasing to all parties is to contact the garden manager in advance the purpose and objectives of the visit. The manager will schedule and compile a tour package / bioedutainment offer. Furthermore, the customer can study the offer and declare agreement / disagreement and so on until a package agreement is obtained.

The dedication team invites to reflect on the question of how you respond to exploration activities in JAS learning. The participants can feel the other atmosphere faced and applied in daily learning as we can be symbiotic with nature. The level of meaningfulness of this activity was assessed by participants from various aspects as follows. Activities can provide technical / practical skills in learning to get a score of 90. This activity can provide high theoretical knowledge, prestige / pride, and self-confidence gets a score of 85. This activity can provide rapid career advancement and work achievement awards scored 67.5. In general, JAS learning is considered effective even very effective by 87% to improve learning processes and outcomes. Participants consider themselves to have mastered the knowledge of JAS learning by 76% to 85%. This has also been proven from various previous studies, such as [1,2,4,6,9,10,11].

There are several things that can be done in collaboration with subrayon 04 IPA MGMP in the future: best practice learning management, classroom action research, research collaboration with students / lecturers, review assistance for teacher work, etc. The MGMP and MGMP members are committed to expressing their willingness to cooperate in the future. Activities that can be carried out in the future come in the form of training on modern biotechnology, developing learning that involves students directly, and identifying plants in the sub rayon 04 area of Semarang City.

4. Conclusion
At the beginning of the activity before the socialization turned out 62.5% of participants had known JAS and stated various positive things about JAS, such as activating teachers and students, making it easier to understand biological material, fun and educating students to think critically. They have also been able to predict the obstacles encountered in learning, especially in time management. With the socialization of the participants can develop RPP and other learning tools that are considered relevant to JAS. However, in the application of learning, it is difficult to achieve the characteristics and nature of JAS in the use of alternative / authentic assessments, exploration of the surrounding environment, and enjoyable learning / bioedutainment. The results of reflection and evaluation indicate that there are still many participants who have not been able to change the mind set to view the object of biological studies in learning from education about being education for. So that in the future activities are needed that lead to best practice in the management of learning, PTK and collaboration.

In accordance with the results of the activities and benefits that are actually expected from this activity, suggestions for the Biology Department of FMIPA UNNES should be more connected and build networks with stakeholders so that the resulting service products can be reached and utilized by the wider community. For biology teachers to build more new knowledge and new ideas including knowledge about JAS to support higher quality biology learning.

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