THE OBSTACLES FACTORS OF GEOGRAPHY INFORMATION SYSTEMS AND REMOTE SENSING PRACTICUM IN A HIGH SCHOOL LEVEL IN WONOGIRI DISTRICT

Seno Budhi Ajar, Gentur Adhi Tjahjono, Inna Prihartini,
[123]Geography Eduaction, Faculty of Teacher Training and Education,
Universitas Sebelas Maret Surakarta
Email: senobudhiajar@staff.uns.ac.id

Abstract

Practicum Geographical information systems and remote sensing have become one of the basic competencies in the realm of skills in the geography learning process at the high school level. The purpose of this study is to identify problems or obstacles faced by geography teachers in carrying out geographic information systems and remote sensing practicum activities in high schools in Wonogiri Regency. This is a qualitative descriptive study with the use of random sampling.Data collection uses a questionnaire about the implementation of geographic information system practice and remote sensing to the teacher. This study uses descriptive statistical analysis techniques to analyze the factors that become obstacles in the application of geographic information system practice and remote sensing in high school. The result is the obstacles factor of geographic information system and remote sensing practicum in in high schools in Wonogiri is(1). Hardware devices that have not been installed software specifically for geography information systems and remote sensing The teacher has a low ability in the geography and remote sensing information system practicum skills and does not coordinate with the teacher or laboratory assistant for Information and Communication Technology (ICT) subjects(3) Insufficient time allocation for practicum and absence of geographic information system and remote sensing practice tests as evaluations.

Keyword :Practicum, Geographical Information Systems, remote sensing,

A. INTRODUCTION

The 2013 curriculum is improved as stipulated in Permendikbud No 24 of 2016, basic competencies contain not only in the cognitive or knowledge domain but also govern the Psychomotor or skills domain and not only in science subjects but also in social, language and basic groups. there are basic competencies in the form of knowledge and skills. This requires each subject to carry out practical activities to fulfill the basic competencies of these skills.

The purpose of the existence of basic skills competencies is to improve life skills for students, especially high school students. Geography subjects in high school are also required to hold a practicum to fulfill basic skills competencies for students. One of the practical activities in geography is the Geography Information System (GIS) and Remote Sensing practicum.

Practicum of Geography Information System (GIS) and Remote Sensing is considered important to improve the life skills of high school students because the use and processing of spatial data in the form of image data and maps using Geographic Information Systems (GIS) and remote sensing methods are often used both for government and private institutions as well as the general public.

Today, Life Skills regarding spatial data processing are very important because planning activities carried out by government and private agencies and by the general public have used spatial data as the basis for its determination, so that the Geographic Information Systems (GIS) and Remote Sensing methods become quite important for students.This is seen in the basic competencies of high school geography subjects where basic competencies regarding Maps, Geography Information Systems and Remote Sensing have two basic competencies in two different grade levels.

The first basic competency for Geographic Information Systems (GIS) and Remote Sensing is in class X in basic competency 3.2 for the realm of knowledge, namely understanding the basics of mapping, remote sensing, and

Geographic Information Systems (GIS) and for the skills domain, basic competency 4.2 which reads creating thematic maps of provincial areas and / or one of the islands in Indonesia based on the map of the Earth.in class XII namely basic competency 3.3 analyzes the transportation network and land use with maps and / or remote sensing images and Geographic Information Systems (GIS) related to the development of regional potential and environmental health and basic competency 4.3 presents thematic maps based on remote sensing image processing and Geographic Information Systems (GIS) for the development of regional potential and environmental health.

The problem is that in order to carry out Geographic Information Systems (GIS) and Remote Sensing practicums, 3 components must be fulfilled.First is the hardware in the form of a personal computer or laptop connected by the internet.The second is both software for geospatial data provider software such as google earth and Geographic Information Systems (GIS) and remote sensing data processing software such as the arc gis and er mapper,third is brainware, namely the teacher's ability to use Geographic Information Systems (GIS)

and Remote Sensing methods, but not all high schools in Wonogiri are supported by these three components.

Based on this, the research aims to look at the application of geography and remote sensing information system practicum at the high school level in Wonogiri and the obstacles encountered during the application of Geographic Information Systems (GIS) and remote sensing practicum at the high school level in Wonogiri.

B. MATERIALS AND METHODS

The form of research is the Research problem with the main issue being Geographic Information Systems (GIS) and Indraja Practicum at the high school level.This research is a qualitative research with descriptive research design.To analyze the application and obstacles in Geographic Information Systems (GIS) and remote sensing practicum at the high school level using six factors that can be an obstacle in the implementation of lab programs, namely(1) unavailability of practicum tools, (2) difficulty in obtaining practical materials, (3) lack of students' knowledge of the material being practiced, (4) limited time allocation, (5) practicum material considered not important, and (6)

absence technician (laboratory) (Atnur, 2015).

C. RESULTS AND DISCUSSION

The application of geographic information system practice and remote sensing at the high school level in Wonogiri district has not gone well.The application of practicum is still experiencing obstacles both in hardware, software and brainware components. Factors that become obstacles in the application of geographic information systems (GIS) and remote sensing practices at the high school level are:

1. **Conditions for Availability of Practical Tools and Materials**
   Geographic information system (GIS) and remote sensing practical equipment in the form of hardware in the form of personal computer devices and internet networks. 96% of high schools in Wonogiri Regency have personal computer facilities and are equipped with internet connectivity.


Personal Computer Sufficiency With The Number of Students
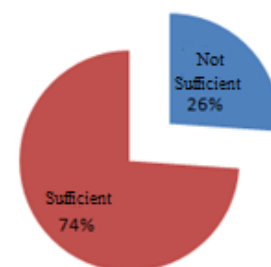
Source: research results, 2018

Based on the adequacy between the availability of the number of personal computers and the number of class students.As many as 26% of high schools in Wonogiri have fewer personal computers than the number of students in their classroom so that the number of personal computers is insufficient for the Geographic Information System (GIS) and Remote Sensing practicum.

Average School Internet Speed
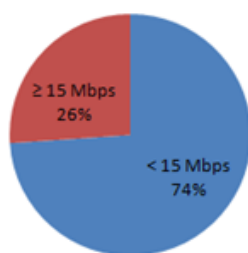
Source: research results, 2018

Likewise on internet speed in high schools in Wonogiri from all schools that have internet networks, only 26% have internet speeds equal to or greater than the average internet speed in Indonesia which is ≥ 15 Mbps and 74% are still below the average internet speed in Indonesia.

Geographic information system (GIS) and remote sensing equipment practicum in the form of software such as geographic information system (GIS) applications such as Arcview,

Arcgis, Qgis while remote sensing applications such as Envi, globalmapper, and Practicum Material Search applications such as Google Earth.

GIS/Remote Sensing Application on School Computer
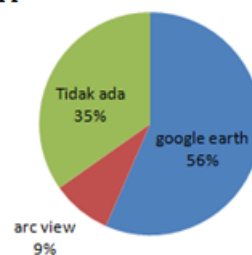
Source: research results, 2018

All high schools in Wonogiri do not have remote sensing applications but there are 9% of high schools in Wonogiri Regency that have installed an Arc View geographic information system application and 56% of Wonogiri District High Schools have installed Google Earth applications and 35% of high schools in Wonogiri District have not installed supporting information systems for geography and remote sensing information systems.

2. **Condition of Teacher Knowledge, Students Knowledge and Availability of Assistants.**

Development of geographic information systems and remote sensing learning began to be taught in the 1994 curriculum and the new

154

geography and sensing information system skills and practicum developed in the 2006 Information Technology Education Unit (KTSP) curriculum developed rapidly while all high school geography teachers in Wonogiri Regency had taught before 2005.This causes all teachers who become respondents only to have knowledge in the theory of geographic information systems (GIS) and remote sensing but for the practicum of geographic information systems (GIS) and remote sensing are still experiencing obstacles and difficulties.Knowledge of the use of geographic information system (GIS) applications and remote sensing both geographic information system (GIS) and remote sensing material search application applications such as google earth, ina-geoportal websites and remote geographic and sensory information system data management applications such as arc-view, Qgis, er mapper, global mapper are still having difficulties in operating the application.In addition, the absence of laboratory staff or practicum assistants makes it increasingly difficult for teachers to apply geographic information

systems (GIS) and remote sensing practices in school learning.

Basic knowledge of high school students in Wonogiri Regency regarding the theory of geography and sensing information systems is far enough where 65% of high schools in Wonogiri Regency have cognitive values. Material of geography and sensing information systems Far above the minimum completeness criteria and only 35% of high schools in Wonogiri Regency have the mean cognitive value of the geography and sensing information system material is far below the minimum completeness criteria.

The Average Cognitive Score of Students on The Theory of GIS And Remote Sensing
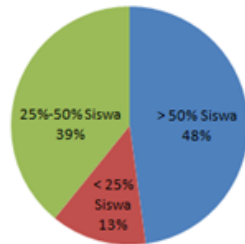
Source: research results, 2018

But only 48% of high schools in Wonogiri Regency have more than 50% of students able to operate computers and the internet properly while 52% of high schools in Wonogiri Regency have less than 50% of students who are able to operate computers isnd the internet well even 13% of them are less than a quarter

155

operate the computer and internet properly.

**The Percentage of Students Who Are Able to Operate Computer and The Internet**

Source: research results, 2018

3. Time allocation and important level of practicum

Basic competency for geographic and remote sensing information system material is in class X for the basis of remote geography and sensing information systems in class XII for geographic and remote sensing information system applications. Allocation provided for teaching material is as much as 44% of high schools in Wonogiri Regency only ≤10 hours of study or 450 minutes or 9 hours and only 13% of high schools in Wonogiri Regency allocate time for material geography and remote sensing information ≥ 20 hours Lesson.

Time Allocation For Learning GIS And Remote Sensing in School
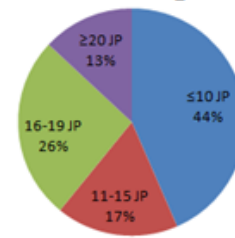
Source: research results, 2018

However, all Teachers consider that the time allocated is only sufficient to allocate time for Basic Competency 3.2 for the knowledge domain, namely understanding the basics of mapping, remote sensing, and Geographic Information Systems (GIS) 3.3 analyzing transportation and land use networks with maps and / or remote sensing imagery and Geographic Information System (GIS) related to the development of regional potential and environmental health, namely in the cognitive domain only while the time for Psychomotor or skills in basic competency 4.2 which reads creating thematic maps of provincial areas and / or one of the islands in Indonesia based on the map of the Earth and basic competency 4.3 presents thematic maps based on remote sensing image processing and Geographic Information Systems (GIS) for the

development of regional potential and environmental health cannot run optimally.

Unlike clusters of natural sciences where branches of natural sciences such as biology, chemistry and physics are obliged to conduct practicum examinations both in daily tests, semester exams and final school exams, while geography enters into a family of social sciences along with history, economics, sociology is not obliged to hold a practicum exam. Although there are psychomotor aspects, the assessment does not go through a practicum exam.

Exam on GIS And Remote Sensing Practicum

Source: research results, 2018

This also applies to geography and remote sensing information systems practicum as many as 91% of high school teachers in Wonogiri do not test geographic and remote sensing information systems practicum and 9% only test it on daily test levels.

Factors that can become obstacles in the implementation of practicum programs Remote geography and sensing information systems in high schools in Wonogiri are:

1) **Lack or unavailability of practical equipment**

Practical Tools Geography and remote sensing information systems consist of two, namely Hardware and Software. Tools in the form of hardware consist of personal computers, there are still>25% of schools, the number of personal computers is still less than the average number of students, as well as internet facilities that still have>70% of schools that have an average speed below the average internet speed in Indonesia and even one some of them still don't have an internet connection. The same thing is also found in the practicum tool in the form of software. Even though >70% of high schools in Wonogiri District have sufficient personal computers but no computers are installed practicum material search applications and processing geographic and remote sensing information systems. Only 56% of schools installed the Google Earth application only and only 9% of

schools installed the arc view application.

2) **The difficulty of obtaining lab materials**

Difficulties here are more directed at the teacher's ignorance in finding practical learning materials Geography and remote sensing information systems in the form of Satellite imagery and aerial photographs. The teacher's ignorance of the ina-geoportal website and downloading Satellite imagery on Google Earth.

3) **The lack of teacher knowledge in the geographic information system (GIS) and remote sensing practice skills**

The teacher's knowledge of the theory of geographic information systems and remote sensing is good but practical skills Geography and remote sensing information systems are still experiencing obstacles. This is because the teachers graduated before 2005 where at that time the geography and remote sensing information systems were taught manually and only the theory had not reached the practicum level and the teacher had not yet received the renewal of geographic and remote sensing information training practices.

4) **Limited time allocation**

Allocations given to teaching information systems and remote sensing material are somewhat lacking because 44% of SMA / MA in Wonogiri Regency are only hanya 10 hours of study or 450 minutes or 9 hours for 2 basic competencies in classes X and XII. This is considered to be lacking in teaching information systems and remote sensing practice because there are many studies of information systems and remote sensing theories.

5) **Practicum material is considered insignificant**

Not like the subjects of the natural sciences. Geographical subjects are not required for practicum exams so that many teachers do not provide remote information and sensing systems and only provide the theory.

6) **Absence of technicians (laboratory staff)**

The absence of laboratory staff or practicum assistants in particular and many teachers who have not collaborated with the teacher or laboratory assistant for Information and Communication Technology (ICT) subjects.

D. CONCLUSIONS

Based on the results of the research, the factors that hinder the practice of geography and remote sensing information systems are:

a. Hardware devices that have not been installed specifically for geographic and remote sensing information systems

b. low teacher skills in geographic information system (GIS) and remote sensing practicum and does not coordinate with the teacher or laboratory assistant for Information and Communication Technology (ICT) subjects

c. Insufficient time allocation for practicum and absence of geographic information system and remote sensing practice tests as evaluations.

E. REFERENCES

Anon, 1989, Libraries. Pasific. Information Bull

Atnur, Witma Novita., Lufri, & Ramadhan Sumarmin. (2015). Analisis Pelaksanaan Praktikum IPA Biologi Kelas VIII Semester I di SMP Negeri se-Kecamatan Lubuk Begalung Tahun Pelajaran 2014/2015. E-Journal PPs UNP. 1-21.

Howari, F.M., Sherif, M.M., Singh, V.P., Al-Asam, M.S., 2007. Dalam : Thangarajan, M. (editor). Groundwater: Resource Evaluation, Augmentation, Contamination, Restoration, Modeling and Management, Springer, Netherland.

Prahasta, Eddy, 2002, Konsep-Konsep dasar Sistem Informasi Geografis, Informatika, Bandung.

Tresna Sastrawijaya. (1998). Proses Belajar Mengajar dan Praktik Kimia. Jakarta : Depdikbud