Introduction Of Geographic Information System (GIS) For SMA/SMK/MA Students In Langsa, Aceh

Teuku Hasan Basri
Department of Physics Education, Faculty of Teacher Training and Education, Universitas Samudra, Langsa, Aceh, Indonesia
e-mail: thasanbasri.unsam@gmail.com

Teuku Muhammad Faisal
Department of Aquaculture, Faculty of Agriculture, Universitas Samudra, Langsa, Aceh, Indonesia
e-mail: teukumuhammadfaisal@gmail.com

Adi Bejo Suwardi
Departmen of Biology Education, Faculty of Teacher Training and Education, Universitas Samudra, Langsa, Aceh, Indonesia
e-mail: adi.bsw@gmail.com

Abstract- Geographic Information System (GIS) application is one of the tools for digital-based information management but not widely understood by Indonesian society including students. The purpose of this paper is to know the understanding level of the application and utilization of GIS for the student in SMA/SMK/MAN in Langsa, Aceh. The study was conducted for 3 (three) months from October to December 2016 in six schools, i.e., SMAN 1 Langsa, SMAN 2 Langsa, SMKN 1 Langsa, SMKN 2 Langsa, MAN 1 Langsa and MAN 2 Langsa. This activity was conducted in two stages, socialization of GIS and evaluating students' level of understanding of GIS concepts. We have selected 100 students from each school as respondents. The level of student understanding was measured using a questionnaire. All data were analyzed by using descriptively quantitative. The results showed that the level of students' understanding of the GIS concept is very good (67.5%). Meanwhile, the number of students that do not understand the GIS concept is only 1.33%.

Keyword: Geographic Information System, Student, Langsa, Aceh.

INTRODUCTION

The development of computer-based technology is currently growing rapidly, along with the reduced interest of people to browse information manually because it takes a long time in getting and finding the desired information. Technology and information is one solution that can help in overcoming this problem with technology and information can be known quickly, precisely and actual. The use of information technology aims to manage various information which is indicated by the speed and timeliness, processing and accuracy and accuracy of information (Testiana, 2016). Based on these information systems, new innovations emerged for the development of information systems. The merging of information systems with geography today is one of the most widely used alternatives in the use of information systems, namely Geographic Information System (GIS). In the development of information systems have many models, this is not separated because of the many innovations that create the design of information systems to facilitate access to various activities in various aspects of life. Geographic information system mapping is one of the most widely used information system models for making decisions, planning and analysis.

Geographic Information System Application (GIS) is one of the tools in digital-based information management. In this case GIS utilization has been developed to various fields such as military, aviation, agriculture, forestry, health, marine, fishery and education (Aini, 2007) . Efforts to improve and develop development, the government is focusing on improving the quality of quality human resources, one of them is through the education path. Information technology is very important role in the world of special education with human resources, because education is a business that is basically directed to develop the potential of young people to have the ability, Skills, attitudes and personality (Baharuddin, 2009).

Computer-based technology, has now penetrated almost all sides of human life. Various disciplines have used this technology to develop theories and their applications through various information systems. One type of information system that is currently very popular, especially in mapping surveys is Geographic Information Systems (GIS). GIS has been utilized by various government and private agencies for planning, monitoring, and evaluation of development outcomes. GIS becomes a very useful tool

for researchers, managers, decision makers to help solve problems, make choices or make spatial policies through map data analysis methods using computer technology (Kharistiani and Aribowo, 2013). The purpose of this paper is to increase the knowledge of SMA / SMK / MA students in Langsa, Aceh towards Geographic Information System (GIS) and to evaluate students' understanding on the results of socialization of Geographic Information System (GIS).

METHODOLOGY

This activity was conducted for 3 (three) months from October to December 2016. This activity was conducted in two stages, namely socialization of GIS and evaluation of socialization result. The socialization of GIS is done at SMAN 1 Langsa, SMAN 2 Langsa, SMKN 1 Langsa, SMKN 2 Langsa, MAN 1 Langsa and MAN 2 Langsa. The number of participants is 100 students from each school so that the total participants are 600 students. Socialization materials on Geographic Information System (GIS) include understanding, workings and GIS applications. After completion of socialization, further measurements of students' level of understanding of the material presented with the division of questionnaires. The data that have been obtained later in the analysis descriptively quantitative.

Data analysis

The level of students' understanding is analyzed by using the percentage method with the following formula:

$$P = \frac{n}{N} \; x \; 100\%$$

Where:

P = Percentage of students' level of understanding

n = The number of students chooses an answer

N = Total number of samples

Criteria:

0 – 25 = very not good

26-50 = not good

51-75 = good

76-100 = very good

RESULTS AND DISCUSSIONS

Science and technology in human life and civilization is always evolving according to the level of

need that is needed in the life of society. Application and utilization of science and technology in life increasingly facilitate the work carried out both by individuals and community groups in order to improve the quality of life.

Geographic Information Systems (GIS) is the first system in the world and results from improved mapping applications that have overlapping capabilities, counting, digitizing / scanning, supporting national coordinate systems, entering lines as arcs with topology and Store locational attributes and information on separate files (Harahap and Yanuarsah, 2012). GIS is a combination of three main elements of the system, information and geographic. Based on these elements, then clearly SIG is one information system that emphasizes the element of "geographic information" consisting of spatial and aspacial data. Basically GIS is a main tool that is interactive and interesting in an effort to improve understanding and learning in education about ideas, concepts and space, population and geographical elements contained on the surface of the earth.

GIS application socialization activities have been conducted on 600 high school students, vocational school, and MA in Langsa. The activity received excellent response from the students. The level of student curiosity is very high as seen from the many students who ask about GIS. Based on the evaluation on the level of students 'understanding on GIS material it is known that in general the students' understanding level is very good (Table 1).

Table 1. Result of evaluation of students' understanding on GIS socialization

| School name | Level of student understanding | | | | | | | |
| | Very not good | | Good enough | | Good | | Very Good | |
	The number of students	Percentage	The number of students	Percentage	The number of students	Percentage	The number of students	Percentage
SMAN 1 Langsa	0	0	0	0	24	24	76	76
SMAN 2 Langsa	0	0	2	2	29	29	69	69
SMKN 1 Langsa	0	0	0	0	28	28	72	72
SMKN 2 Langsa	0	0	4	4	18	18	78	78
MAN 1 Langsa	0	0	0	0	37	37	63	63
MAN 2 Langsa	0	0	2	2	51	51	47	47

Students' understanding of the GIS material presented is generally very good at 67.5%. Meanwhile, the number of students who do not understand the material presented is only 1.33%. This shows that the GIS material presented is very easy to understand by the students. Students feel that this activity is very

important because in the socialization of GIS is also explained about the application and utilization of Geographic Information System (GIS), i.e.:

1) Improve organizational integration

Many organizations that have implemented GIS have found that the main advantage they gain is improved management performance of the organization and its resource management. This happens because GIS has the ability to connect multiple data devices simultaneously by geographic, facilitating information that occurs between sections, to be mutually utilized and communicated. By creating a database that can be utilized together, a section will benefit from the work of other parts, where the provision will apply, that data is sufficiently collected, but can be used multiple times.

2) Make the decisions more perfect

GIS is not a system capable of making decisions automatically, but only a means for retrieving data, analyzing it, from a mapping-based data set to support the decision-making process. This technology is widely used to assist various work activities such as presenting information at the time of planning, helping to solve problems related to territorial chaos. GIS can also be used to help make informed decisions about where to build a new school unit (USB) that has as little as possible with the number of school-aged residents, being in the least risky location, and close to the population center (Apriyanti and Firman, 2014) . Information can be presented in a concise and clear form of map drawing, accompanied by reports, enabling decision makers to focus their attention on real issues rather than understanding data. Because GIS products can be made quickly, with various scenarios, to be evaluated effectively and efficiently.

3) Helps create maps

Map is key in GIS. The process for creating (drawing) maps with GIS is much more flexible, even than by drawing maps manually, or with an all-automated approach to cartography. Begin by creating the database. The existing map image can be drawn with a digitizer, and certain information can then be translated into GIS. GIS-based cartography database can be continuous and scale-free. Maps can then be created centrally in various locations, with any scale, and show selected information, which reflects effectively to explain a particular characteristic (Sudarmilah *et al*., 2012)

Geographic Information System (GIS) can also be implemented in education. By knowing what the GIS and the benefits of GIS implementation and the components needed to make GIS, we can know that the role of GIS in education is as follows:

1. Equity and expansion of access to education

This role can be done with the existence of school mapping which when synergized with the utilization of GIS, will be obtained a system that can record the regions or regions which have not served the education well to be given a solution (such as: the provision of block grants). So that the planned programs can be right on target. In addition, the determination of the location of new schools can be done by combining some data (school age population) with maps (road network maps, land use maps, maps of industrial estates) so that a comprehensive education plan can be obtained. The overlay, query, buffer functionality of the GIS will be helpful in this process (Basyid and Suradianto, 2011). In this case it is evident in the case of the Rehabilitation and Reconstruction Program in Aceh after the earthquake and tsunami waves.

2. Improving the quality of education,

With this GIS application program can provide convenience to students in learning geography. Especially at this time, SIG is an open or free public service that can be obtained anytime through the internet, so that GIS can be accessed by all students anywhere. Where Geography is a science that studies the surface of the earth by using spatial approach, ecology, and regional complex. The observed phenomenon is the dynamics of the development and development of existing areas in the life of the community, for example information on the location and distribution of natural events and the phenomenon of the presence of resources. The availability of geographical data is the meaning of a spatial structure, which will facilitate the various interests. Knowledge of important geographical information is shared by the wider community as part of an understanding of the resources and vulnerability of disasters that may occur around them (Rachmawati, 2010)

3. Educational planning that is aligned or in line with the potential and development of the region

By using GIS program application, it can be determined what local potential that can be

developed by a region. And to provide human resources in charge of developing the region, the development of education should be tailored to the potential of the region so that the resulting output can be utilized to cultivate that potential, especially in the field of education to determine what curriculum and local content will be included in school teaching and location and type determination What vocational school is suitable for the area. Suppose the determination of the location and type of vocational high schools of fisheries and maritime for coastal communities and high schools of agriculture and plantation (SPP-MA) for people living in plantation areas or mountain slopes (Suryani *et al*., 2012).

CONCLUSIONS

The application and utilization of Geographic Information System (GIS) in this socialization explains the benefits of using GIS including enhancing organizational integration, making more perfect decisions and helping to map. The activity received excellent response from the students. The level of student curiosity is very high as seen from the many students who ask about GIS. Students' understanding of the Geographic Information System (GIS) material presented by researchers is generally very good at 67.5%. Meanwhile, the number of students who do not understand the Geographic Information System (GIS) material presented is only 1.33%.

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