Geography literacy can develop Geography skills for high school students: is it true?

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Abstract. The most important issue related to education in Indonesia is the low quality of student learning and competence. The basic thing that is important to be studied is the demands of 21st-century skills that are difficult to fulfill with the low competence of student learning. Low competence of student learning demonstrated by low capacity of scientific literacy includes geography literacy. Geography skills of Indonesian students are also low. It is shown from the students' ability to use maps to describe and to analyze is low. The purpose of this study is to determine the correlation between the literacy skills of geography to develop geography skills of high school students in Surabaya. Written and performance tests were given to the sample of 29 high school students. The results of the tests we analyzed based on Geography literacy and its correlation to Geography skills in terms of the ability to use the media, map, and analyze the phenomenon of the geosphere. The results showed that the students who have low literacy geography have difficulty in using map.

1. Introduction
Understanding and responding to the challenges and opportunities of the world in the twenty-first century will require many skills; the capacities to think and communicate mathematically and scientifically will remain at a premium. Geographic literacy will also be necessary for some reasons of enhancing the economic competitiveness, preserving the quality of life, sustaining the environment, and ensuring national security. As individuals and as members of society, human face decisions on where to live, what to build, where to travel, how to conserve energy, how to wisely manage scarce resources, and how to cooperate or compete with others [8, 11].

Making all of these decisions, personal and collective, requires a geographically informed person or someone who can see the meaning in the arrangement of things on Earth’s surface, who can see relations between people, places, and environments, who can use geographic skills, and who can apply spatial and ecological perspectives on life situations. Geographic skills make a person can understand the connections between patterns of rivers and the physical processes that create them, between patterns of cities and the human processes that create them, and between what happens in the places in which we live and what happens in the places throughout the world near and far.

The goal of the National Geography Standards is to enable students to become geographically informed through knowledge and mastery of three things: (1) factual knowledge; (2) mental maps and tools; (3) and ways of thinking [8]. UNESCO writes literacy is a fundamental human right and the foundation for lifelong learning. It is fully essential to social and human development in its ability to transform lives. For individuals, families, and societies alike, it is an instrument of empowerment to
improve one’s health, one’s income, and one’s relationship with the world. The uses of literacy for the exchange of knowledge are constantly evolving, along with advances in technology. From the internet to text messaging, the ever-wider availability of communication makes for greater social and political participation [16].

Geographic literacy could be defined as the competence of turning understanding and comprehension of geographical knowledge into a skill because literacy consists of solving problems, reasoning, critical and creative thinking processes. Geographic literacy skills, bring this competence to a conscious level and contribute to students’ geographic literacy skills and processes in their professional lives [3]. In this context, geographic literacy does not only mean geographical knowledge. Literacy is a systematic approach towards events, founding, situations, and places which requires understanding, comprehension, analytical and synthesis skills. On Earth where we live as a part of the geographical environment, human beings and nature are affected by each other directly or indirectly.

A geographically literate person has the skill to look for solutions which cause the least damage to nature and reduce negative side effects. Additionally, he/she has the skill to understand the relationships between different cultures and people. To achieve this, a person should first learn the features of where he/she lives, why he/she lives there, what the surrounding events and discoveries are, and how and when the relationships between these could affect him/her. In order to do this, one should have a good geographical vantage point.

Geographic literacy was described in the literature as one of 34 new literacy fields, along with environmental literacy, media literacy, economic literacy, visual and technology literacy [2]. According to the United Nation (UN), literacy is described as "individuals acquiring the basic living skills, being able to solve the problems they may face in life, understanding the societies and the economies of the 21st century, and actively participating in them".

In a study carried out in the USA in 1988, the National Council for Geographic Education [NCGE] attempted to determine the geographic literacy level of Americans. The results showed that 14% of Americans could not show their country’s location on a map, and 25% did not know the location of the Pacific Ocean [15]. In Indonesia, the literacy skills of learners are still low. Results of Indonesian National Assessment Program (INAP) explained that 73.61% of learners have the less knowledge about science literacy skills and 46.83% students have less ability to read. The purpose of this study is to analyze the literacy skills of geography and to develop geography skills of the students.

2. Literature review

Literacy is described as "individuals acquiring the basic living skills, being able to solve the problems they may face in life, understanding the societies and the economies of the 21st century, and actively participating in them. Geographic literacy could be defined as the competence of turning understanding and comprehension of geographical knowledge into a skill because literacy consists of solving problems, reasoning, critical and creative thinking processes” [3].

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Many researchers have described the concept of geographic literacy as the knowledge of a location or the skill of positioning a location on a map [13,15]. However, some researchers state that knowledge of a location is not enough to describe geographic literacy, instead proposing that having the knowledge of the location of places is the basic level of geographic literacy (Keeling, 2003; Bein, 1990; Donovan, 1993). Backler and Stoltman stated that having location knowledge is only the first step to geographic literacy and the real literacy is the ability to use geographic knowledge and skills [16]. In another description, Eve, Price and Counts (1994) described geographic literacy as the skill of reading a map, having location knowledge and the skill of understanding interactions between cultures
and people in other areas. The concept is not limited to reading graphics, reading maps or skills related to field observations; it also requires having a geographical view [2].

Geographic literacy is divided into three groups: low, middle, and high level. Low-level geographic literacy consists of the capability of knowing a location. Middle level requires one to understand human interactions with the environment in terms of cause-effect relationships. This level consists of the skills of questioning, verifying, evaluating and analyzing. High-level literacy is a critical geography approach [10]. At this level, people understand the difference in the powers and natural resources of countries related to geography. For this reason, geographic literacy, instead of being plain knowledge, it is a capability which helps in coping with daily problems [13].

In a different study, Oigara measured the low-middle-high level geographic literacy skills of university students. In the research, it was found that the geographical knowledge of students was generally weak [13]. Torrens measured high school students’ location knowledge of European countries and major cities. As a result of the research, it was found that the basic location knowledge of students was insufficient [15].

3. Methods
This research was conducted on a class of XI student of social sciences program at a high school in Surabaya, Indonesia. The total is 28 students of 11 girls and 17 boys. Geography literacy in the study includes media literacy, literacy maps, and knowledge of geography related to world issues and current events (population, natural resources, and weather, health, urbanization, deforestation, climate change). Geography literacy skills are assumed to affect the geography skills. High literacy skills showed high geography skills. Data of geography literacy skills is gotten through a written test and a performance test. Data were analyzed descriptively.

4. Results and Discussion
It is explained like any social or physical scientist, that the geographer’s goal is to ask and answer questions in order to gain knowledge. By asking a question, the geographer will develop a hypothesis and measure variables in order to confirm or deny the hypothesis, just as any scientist would do [9]. The geographer is not limited, however, to any one discipline, type of data, or set of tools. He or she is free to use any available information or tools in order to understand how and why things appear as they do in Earth space. That is being said that geographers do use a method that requires certain skills. These are the skills your students must learn in order to “do geography.”

The National Geography Standards identify five skills that will guide a geographic inquiry. These five skills enable geographers to (1) ask geographic questions about spatial distributions and processes, (2) acquire geographic information about distribution, (3) organize geographic information, (4) analyze geographic data, and (5) answer geographic questions [8]. Literacy ability of geography in the study includes media literacy, literacy maps, knowledge of geography related to world issues and current events (population, natural resources, and weather, health, urbanization, deforestation, climate change). Literacy geography student of SMAN 18 Surabaya can be seen in the following figure.

![Figure 1. Literacy ability geography](imageurl)
Based on the result of written test and performance tests conducted by 28 students, the result is below average. This proves the average literacy 64.11 geographies. Low literacy skills, especially with the ability to use a map to show the location, describe the characteristics of an existing location on the map that the average 36.35. Students' ability to use the media to explain the phenomena, the symptoms and the process is already well (79.18).

### Table 1. Students’ Geography Literacy

| Geography Literacy Component | Average Value |
|-----------------------------|--------------|
| Media Literacy              | 79.18        |
| Literacy map                | 36.35        |
| Knowledge of geography      | 76.79        |
| Average Geography Literacy  | 64.11        |

Students' skills in analyzing and studying the phenomena of the geosphere are also good (76.79). Students with literacy skills in analyzing the phenomena of good geosphere turned out to have the literacy skills and media literacy skills using a good map scoring the average of 70.39. When linked together between geography and literacy skills to read a map and to show the location and assess the characteristics of the region on the map is visible in Figure 2 below.

![Geography skill and literacy map](image1)

**Figure 2. Geography skill and literacy map**

Geography skills of students grades on average 70.39. Geography skills are not supported by the literacy skills using a map as a tool for navigation skills and the identification of the place. The score of literacy map of the students is 36.35. Geography skills are well supported by media literacy skills and knowledge of geography. And location is the first of four concepts which Gershmel identifies as the core constituents of geography: 1) location, i.e., knowing where things are; 2) place, i.e., understanding the unique character and differences of places; 3) links, i.e., knowing connections between different locations; 4) regions, i.e., comprehending spatial patterns, both formal and functional, at a larger scale [4].

![Geography skill and knowledge of geography](image2)

**Figure 3. Geography skill and knowledge of geography**
Knowledge of geography supports students’ geography skills. There is an average score of 76.79 on geography knowledge. Students who have a good knowledge of geography also has good geography skills. Geographic literacy could be defined as the competence of turning understanding and comprehension of geographical knowledge into a skill because literacy consists of solving problems, reasoning, critical and creative thinking processes. Today, in order to impart literacy skills to individuals, teachers should first have these skills. It is important that teacher candidates should attain these skills before graduation. When these conditions are established, it will be easier for teacher candidates to be aware of their geographic literacy skills, bring this competence to a conscious level and contribute to students’ geographic literacy skills and processes in their professional lives [3].

Pellegrino described the specific skills seemed to be “21st-century skills” may be defined, categorized, and determined differently from person to person, a place to place, or school to school, the term does reflect a general-if somewhat loose and shifting-consensus. An illustrative overview of the knowledge, skills, work habits, and character traits commonly associated with 21st-century skills. One of them is Information and communication technology (ICT) literacy, media and internet literacy, data interpretation and analysis, computer programming [11].

The convergence of media and technology in a global culture is changing the way we learn about the world and challenging the foundations of education. It is no longer enough to read the printed word; children, youth, and adults too. They need the ability to both critically interpret the powerful images of a multimedia culture and express themselves in multiple media forms. Media literacy education provides a framework and a pedagogy for the new literacy needed for living, working, and citizenship in the 21st-century. Moreover, it paves the way to mastering the skills required for lifelong learning in a constantly changing world [14].

It is important for students to master the media and ICT today. Students' skills in using media and ICT to analyze the problems. In a global media culture, people need two skills in order to be critical thinking and self-expression. Media literacy instills both of these core skills, enabling the future student to sort and understand geosphere phenomena. The results of performance tests indicate that the ability of the average student in good media literacy (79.18). It supports students’ geography skills. In lessons, media help students to analyze geographic knowledge related to various issues that occur in Indonesia such as deforestation, forest fires, urbanization, an outbreak of dengue fever.

5. Conclusion
One of the character traits commonly associated with 21st-century skills including critical thinking, problem-solving, reasoning, analysis, interpretation, and synthesizing information, Information and communication technology (ICT) literacy, media and internet literacy, data interpretation, and analysis, computer programming. 21st-century skills require that students have the literacy skills of science is no exception geography literacy. In general science literacy of students is still low. Low
literacy is still low competence related science student learning. Geography literacy knowledge and skills related to geography. Literacy geography visits media literacy, literacy map and geographic knowledge. The results showed geography literacy skills supported by good knowledge of geography. What needs to be studied further is the low literacy map high school students. This affects the low literacy geography.

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