



MAPPING OF THE INTENSITY OF INFORMATION TECHNOLOGY LITERACY INTEGRATION WITHIN GEOGRAPHY LEARNING IN WEST JAVA

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ABSTRACT

Information Technology (IT) development is a circumstance that affects various aspects of life. Education in the 21st century is inseparable with the advancement of information technology, both to improve teachers' quality of teaching and exposes to students to the ability to utilize information, integrate it with their knowledge, and solve problems. In regards to this, integration of information technology within scientific learning is crucial, however mapping of teachers' information literacy has not been initiated yet. Therefore the aim of this research is to conduct a study and mapping the intensity of information technology literacy integration within geography learning in West Java. The result of this study shows that teachers' already know what information technology is in geography learning but not yet know how to implement it properly in each topic or material. The gap of knowledge and practice of implementing IT in the learning process has resulted in the implementation occurring only at frequent intervals even when the facility is sufficient.

Keywords: *Keywords: Information Technology Literacy, Scientific Learning, Teachers Competency*

INTRODUCTION

At present times, the massive development of information technology brings the world into the globalization, industrial 4.0, and society 5.0 eras. The existence of information technology has been accommodated in education as well as learning processes, both on teachers and learning processes (Chandra et al, 2019). Competency standards for teachers, as written in the Law of Republic of Indonesia Number 20 Year 2003; and Law of Republic of Indonesia Number 14 Year 2005; and Regulation of Minister of Education Number 16 Year 2007, comprise of pedagogical competencies, interpersonal competencies, professional competencies, and social competencies (Ningrum, 2009).

Those four competencies have been integral and synergistic in enshaping competent

teachers. Teachers can carry out their professional duties, proven by attaining teacher certification (Ningrum, 2012). As studied by Zulfitri et al (2019), certified teacher profession enhances teachers' continuous self-development in order to improve their professionalism. One of the demands for teachers to fulfill in industry 4.0 and society 5.0 eras is to be technologically literate, both for the learning process as well as self-development, which is part of pedagogical competence (Sudibjo et al, 2019; Faulkner & Latham, 2016).

The 2013 Curriculum mandates current education to comply with scientific learning, which emphasizes the ability to explore certain matters from various sources, formulate numerous problems, thinks analytically, as well as collaborate on solving problems (Wulandari,

2020; Susilana, 2014). This learning orientation is guided by the use of recommended learning models, namely: problem-based learning, inquiry learning, discovery learning, and project-based learning (Sinambela, 2017).

The demand of graduate competences, especially at the level of high-school, is to attain Graduate Competency Standards (*Standar Kompetensi Lulusan/SKL*) which is implemented in the 2013 Curriculum. At the high school level, students have to be able to think and act. But moreover, students are encouraged to be creative, productive, critical, autonomous, collaborative, and communicative (Rachmawati, 2018). Based on various sources stated above, it can be concluded that 4Cs competency is a crucial aspect that needs to be accomplished by students and has to be one important objective on education internalized by every individual (Supena, 2021).

Based on education and learning perspectives, Bruce (2013) stated that “information literacy is defined as the ability to access, evaluate, organize, and use information in order to learn, problem-solve, and make decisions in formal and informal learning contexts, at work, at home, and in educational settings”, this definition show that information literacy is an ability to access, evaluate, organize, and utilize information into learning processes, problem solving, decision-making both formally and informally in the context of learning, working, personal matters, or in education. UNESCO’s *Information for All Programme* (2008) points out that information literacy is personal ability to:

1. Aware of information needs;
2. Find and identify quality of information;
3. Evaluate information critically;
4. Integrate information within the knowledge;
5. Communicate their knowledge effectively, legally, and ethically.

Ezziane (2007) and Downs et al (1995) argue that having the competence to face information technology development and implement it in learning processes is an inevitable demand for teachers. In Indonesia, this is based on The 2013 Curriculum demands, which is professionalism demands and

actualization of pedagogical competencies to conduct educational education processes (Rahim et al, 2019). Therefore, studies on mapping teachers’ competence upon integrating information technology literacy in geography learning are crucial. Based on deep pre-research studies both theoretically and empirically, information technology literacy is important for students. Thus, the teacher takes the responsibility to integrate it within the scientific learning as mandated by The 2013 Curriculum. Nevertheless, studies on information technology literacy of teachers in West Java Province are not yet common.

RESEARCH METHOD

This research studies the development of micro-teaching evaluation instruments in the subject of geography. Based on its characteristics, this research is conducted in three stages, carried out through qualitative approach and descriptive methods. Research variables are evaluation or assessment, micro-teaching, and basic teaching competencies. The subject of this research is high school geography teachers in West Java Province. The instruments of this research are literature studies, documentation studies, Focus Group Discussion (FGD) format, review format, and validation format. Data analysis is carried through qualitative descriptive analysis to present comprehensive explanation and interpretation on each aspect of the study.

RESULTS AND DISCUSSION

Evaluation of Information Technology Literacy in West Java Geography Teachers

Data regarding Information Technology (IT) literacy of geography teachers in West Java Province is processed through questionnaire accumulation. Analysis of IT literacy does not solely measured whether teachers are already able to implement IT in their teaching activities. Furthermore, teachers have to understand different kinds of IT devices that can be applied in teaching, how to implement it, and when it can be implemented in a geography learning context. This is in accordance with the definition of IT literacy,

which is the ability to access, evaluate, organize, and utilize the information on the learning process (Sperry & Baker, 2016).

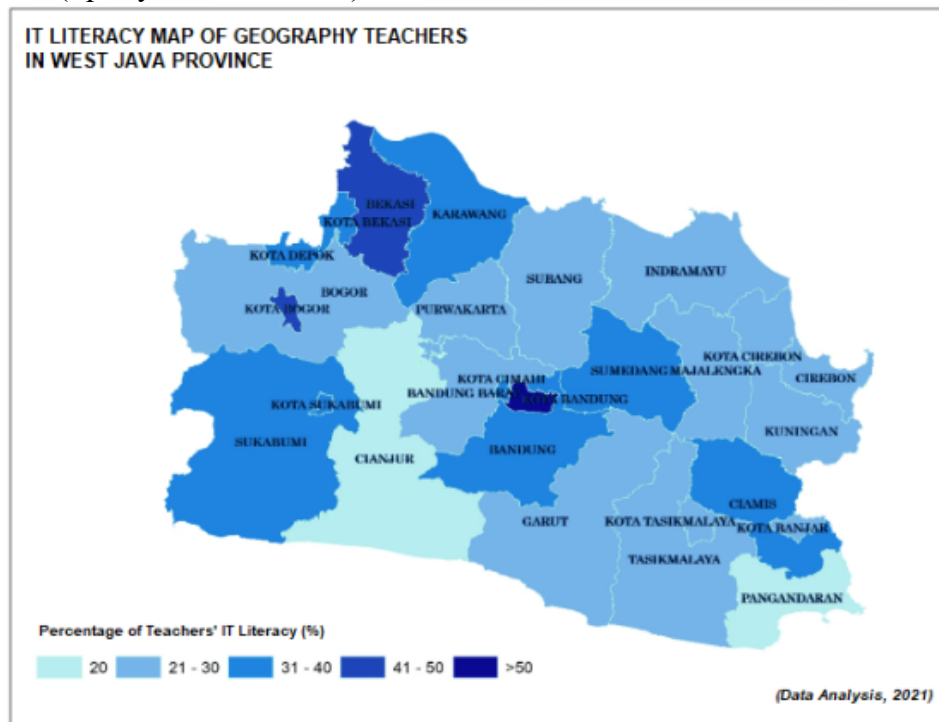


Figure 1. IT Literacy Map of Geography Teachers in West Java Province

Each question item, both reflective or confirming questions, will show the match of teachers' understanding of IT and ideal IT implementation, therefore this will present the level of IT literacy of geography teachers in current time. This has to be studied due to the general views that IT implementation in the learning process is merely an activity of designing learning materials using internet-connected media, yet not autonomously creating the material or not integrating IT into teaching activities (Lapisa et al, 2019; Papert, 1987). Current general views and practices of IT implementation on learning have not yet actualized the objectives of scientific learning and 21st Century Learning Competencies.

Based on a questionnaire filled out by 371 respondents, all geography teachers in West Java Province, as many as 59,2% teachers stated that they already know IT on geography learning. Through this number, it can be assumed that geography teachers in West Java Province have already attained the very basic foundation of conducting geography learning

based on IT implementation. Even so, the next question on types of technology that can be applied in geography learning has a positive answer of 49,3%. In other words, not all teachers that know IT media or devices that can be applied also know the IT variation in geography learning. Findings from these two questions highlight the gap between teachers' knowledge and practice.

The impact of gap between teachers' knowledge and practice on implementing IT in learning can be observed in the next question items. Firstly, only 28,2% of teachers understand how to implement IT in geography learning. Secondly, as many as 79% of teachers use existing platforms for online learning, which resulted in only 16% of teachers being able to create and organize their own LMS or other internet-based learning media. From those 79% of teachers, *Google Classroom* is the mainstream platform for managing learning. In addition, 57,25% of this number uses platforms like *YouTube*, *Zoom Meeting*, *Google Meet*, and *WhatsApp* to conduct learning.

Autonomous information technology implementation on learning is crucial due to the objectives of teachers' IT literacy being mainly to facilitate students to attain 21st Century Learning or 4Cs competencies. Meaning that if teachers' ability to implement IT is only to deliver existing sources of internet information, there are still competencies that are not yet fulfilled. For instance how can teachers be able to process the information, integrate information into the subject, and utilize information for problem solving?

Mapping of Teachers' Information Technology Literacy in West Java

Based on questionnaire data, there is a correlation between location where teachers work and the teacher's IT literacy. In a previous sub-result and discussion, a qualitative analysis on general IT literacy of teachers was carried out without considering the location factor. In this part, previous data has been accumulated and will be presented in regards to teachers' location as shown in Figure 2.

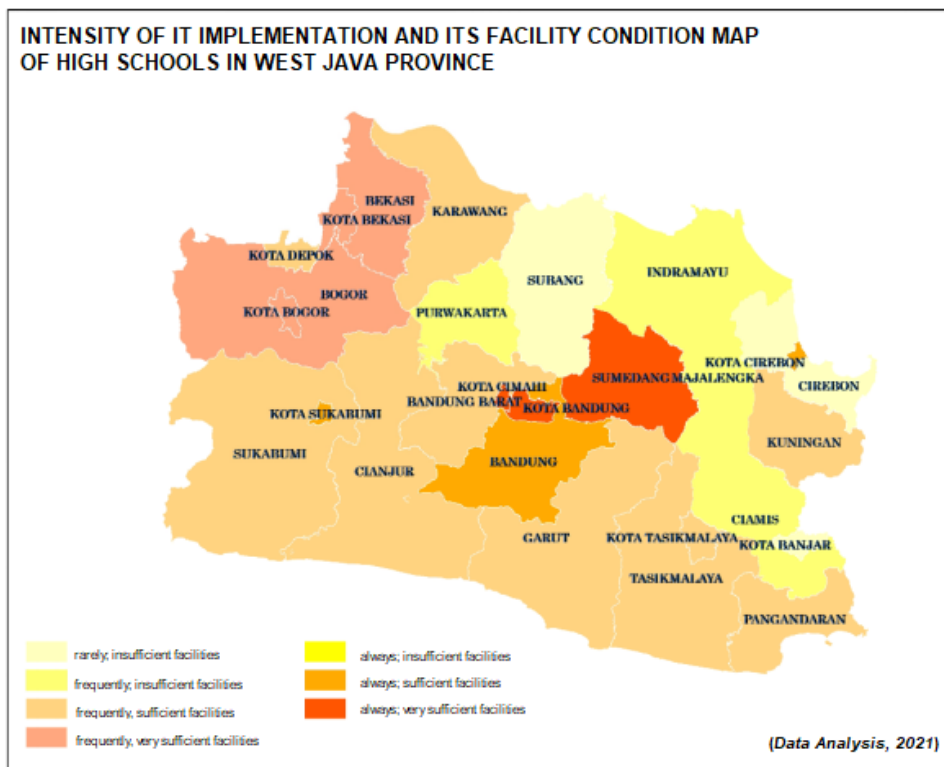


Figure 2. Intensity of IT Implementation and its Facility Condition Map of High Schools in West Java Province

Teachers' IT literacy, in this regard, is the representation of teachers' IT literacy competencies, which involves knowledge and practical ability on IT implementation. Closer to 100%, it indicates that teachers at certain locations have already fulfilled IT components. The majority of geography teachers in West Java Province attain IT literacy at a range of 21-30%, meaning that these teachers are still not mastering IT practice in learning, even though they already know what IT is in geography learning. The proper practice of

when implementing IT in certain topics or what IT is best for each topic are not yet mastered or shown by teachers in this group.

Group of teachers whose IT literacy is in the range of 0-20% are those who stated that they already know what IT is in geography learning, but the implementation of IT itself is just commonly practiced during distance or online learning. Teachers in this group do not know what IT is best for certain topics or when it should be implemented. Most of the teachers in this group work in Pangandaran Regency

and Cianjur Regency. To conduct an objective analysis of how it relates to local development indexes (social and economy), there has to be separate and specific study justifying the factors.

Teachers who are in the group of IT literacy of 31-40% are those who already know what IT is in geography learning, know various IT for geography learning, but are not yet able to implement IT in geography learning. This is proven by their answers, which imply less than 10% of the whole materials or topics in the curriculum that they thought it needed IT implementation. Teachers in this group are from Bekasi City, Depok City, Karawang Regency, Sukabumi Regency, Sukabumi City, Bandung Regency, West Bandung Regency, Sumedang Regency, Cimahi City, Ciamis Regency, and Banjar City.

Geography teachers in West Java whose IT literacy is in the range of 41-50% are those who already know what IT is in geography learning, know various IT in geography learning, and understand how to implement it. However, teachers in this group are still utilizing existing platforms or media. In addition, their practices on IT implementation in school is mainly since the pandemic or on distance learning. Teachers in this group are from Bogor City and Bekasi Regency.

Teachers whose IT literacy is in the range of >50% are those who already know what IT is in geography learning, know the variety of IT for geography learning as well as how to implement it. These teachers are also conducting IT based learning with the utilization of school-developed LMS. Most of the teachers who are in this range are from Bandung City. Even so, it cannot be justified that they have already reached 100% of IT literacy components. This relates to the fact that IT, as stated by Hamidi et al (2011), is only the medium to deliver audiovisual materials, references, and evaluation processes, instead of a medium for scientific learning projects that resulted in problem solving products.

Mapping Teachers Information Technology Literacy Based on Its Intensity

Based on the identification of IT implementation in geography learning, it has been demonstrated that the intensity of IT implementation varies by location. The fundamental difference between these two approaches is the condition of the supporting facility. In regards to that, Figure 2 shows IT implementation intensity between locations and the condition of their facilities.

The map combined data on IT implementation intensity on geography learning based on three options: rarely implemented, frequently implemented, always implemented. This correlates to the next indicators of facilities which can be insufficient, sufficient, or very sufficient. This data can also confirm IT literacy of geography teachers. Within the findings, there can be a situation where IT implementations is not frequent amid the sufficient facilities.

Most geography learning in cities or regencies in West Java Province has sufficient facilities but is implemented only frequently. This can relate to the IT literacy of geography teachers in West Java, who generally have not yet understand what IT is best to be applied in certain topics, therefore ideal IT implementation is still incomplete.

Some of the regions indicate the very sufficiency of the facility and the teachers always implement IT on learning. These locations are Bandung City, Cirebon City, and Sumedang City. Data of teachers' literacy in these locations shows at least 10% of materials are implemented through ideal IT mediums. Cirebon City and Bandung Regency records the sufficiency of facilities for implementing IT and always implementing IT. Meanwhile, teachers in Banjar City, Ciamis Regency, Majalengka Regency, Indramayu Regency, and Purwakarta Regency stated that they always implement IT on learning even though the facility is insufficient.

Some regions in the province, namely Bekasi City, Bekasi Regency, Bogor City, and Bogor Regency shows sufficiency of facilities for learning but the implementation of IT is

only frequent, The sufficiency of facility that can support education process can be determined by local social-economic condition, especially in the west part of the province.

Teachers in Cirebon Regency and Subang Regency stated that they rarely implement IT on learning due to the insufficiency of facilities in these areas. This also relates to the IT literacy attained by teachers in these two locations, which are categorized as teachers who do not yet know how to implement IT on certain matters or topics in geography learning.

CONCLUSION

At present, teachers are pushed to be able to conduct learning based on IT, which serves two main goals, to deliver learning materials for students and, at the same time, to improve the quality of students, especially in processing information. Nevertheless, the common practice of what so called IT in learning is merely understood as using internet-based sources for delivering learning materials or helping students work on their assignment. This does not reflect the quality of IT literacy, both for students or teachers. This study found that 59,2% teachers or know what IT is in geography learning but only 28,2% know how to implement it, especially to match it for each topic. Only 21-30% of all components of IT are actualized in current geography teaching and learning practices, which only covers the ability to be aware of information technology and find sources of information, still leaving an important aspect of IT literacy, which is utilizing information for problem solving. These studies show that sufficiency of facility does not affect the advancement of IT literacy. It has been found that most schools in West Java province already have sufficient facilities, but the practice of implementing IT on geography learning is frequent. In this regard, this research suggests that there has to be a local initiative from each school to encourage their teachers on using learning management systems and be trained on preparing learning materials that are in line with components of IT literacy.

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