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MODULE DEVELOPMENT ON GEOGRAPHY LEARNING TO ENABLE SPATIAL THINKING USING GIS APPROACH: PRIMARY SCHOOL STUDENT

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ABSTRACT

Geography is an important subject that needs to be learned by primary students. The issue is the limited exposure to the geography and spatial thinking element in primary school since the geography subject is starting to be learned in high school. The effect of this limitation is that the primary students lack basic knowledge of geography. Using the Geographical Information System (GIS) platform, learning geography can be more interactive and increase the student's spatial thinking. This study proposes a geography module that integrates spatial elements for primary school. The objectives of this study are i. to determine spatial thinking elements to be adopted in geography learning using the GIS platform, ii. to identify attractive Geography learning through the proposed GIS Geography module, and iii. to assess the student acceptance of the proposed module The module on geography learning was developed using the GIS platform, Google Earth. Spatial thinking elements such as distance, direction, location, coordinate, boundary, region, area, and shape were adapted into the modules. Explore World Through Google Earth platform, webinars were held on 23 April 2022 to collect the questionnaire data. The data from the questionnaire has been used to analyse the student's acceptance and knowledge assessment of the module using SPSS software. Paired sample t-tests are used in this study to investigate the student's acceptance and the student knowledge assessment. The user acceptance of this module is high, 0.001 and 0.002, and the student knowledge assessment is improved since the statistical value is 0.001. This study helps the primary student to expose the roles of geography in their daily life through GIS and enhance their spatial thinking through the sharing session.

KEYWORDS: GIS, Geography Education, Spatial thinking

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CHAPTER ONE
INTRODUCTION

1.1   Research Background

Geography is the study of places and people's interactions with their surroundings (Boudreau et al., 2011). Geography is a discipline that teaches pupils about the world and its place within it. It enables the development of critical-thinking skills, technical skills, citizen skills, and life skills necessary for addressing today's global concerns (Rankin, 2016). Spatial thinking is defined as the ability to think about the nature and notions of space, the representation of spatial information such as maps and graphs, and the process of spatial reasoning such as decision making (Rahayu et al., 2019). There are four (4) steps in an inquiry: i. asking a geographical question, ii. acquiring geographical data, iii. exploring geographical data, and iv. analysing geographical information. In schools with advanced GIS inquiry, teaching and learning using GIS have shifted toward a more in-depth style of questioning based on geographical evidence and including students in interrogating the why and where. As a result, GIS is an appealing prospect for most geography instructors (Fargher, 2018).

Students can develop spatial thinking skills by being exposed to questions that focus on the critical components of spatial thinking, such as the country's location and shape (Jo et al., 2010). Spatial thinking entails imagining, analysing, and reasoning about space by referring to its location, distance, direction, relationships, movement, and change (Mohan, 2014). Geographic Information Systems (GIS) techniques will enhance the ability of students to think spatially. Cheung et al. (2011) presented ways to promote spatial thinking through GIS and satellite images in a teacher-friendly manner. One of the initiative's key goals is to assist students in developing critical thinking, information technology, and lifelong learning abilities through the Independent Enquiry Learning (IEL) approach. By spatial thinking, the application of spatial notions such as distance, direction, and region; representational tools such as maps and graphs; and the cognitive processes necessary to comprehend and solve issues (Jo et al., 2010).

Students' attention to spatial thinking abilities must be directed by geography learning paradigms that emphasize spatial cognitive characteristics. For instance, a student may have