JURNAL MUDABBIR

(Journal Research and Education Studies)

Volume 5 Nomor 2 Tahun 2025

http://jurnal.permapendis-sumut.org/index.php/mudabbir **ISSN: 2774-8391**

Perspective of Social Studies Educator Students on The Use of Digital Maps And Google Earth (Geographic Information System) Gis in Remote Sensing Course

Suci Ramhadani[1], Ananta Diaayu Puspitasari[2], Rizza Firmansyah[3], Wahyunengsih[4]

[1,2,3,4] Universitas Islam Negeri Syarif Hidayatullah Jakarta

Email: [1] suciramhadani0@gmail.com, [2]anantadiaayu19@gmail.com, [3]jaul1619@gmail.com, [4]Wahyu.nengsih@uinjkt.ac.id

ABSTRACT

This research aims to analyze the application of Google Earth and digital maps in remote sensing learning and evaluate its strengths and challenges from a student's perspective. Although students generally show a positive attitude towards digital technology, obstacles such as inadequate infrastructure, less interactive learning methods, and low GIS literacy persist. Using a quantitative method, a descriptive statistics of 26 students in the sixth semester of geography concentration was analyzed descriptively using Microsoft Excel. The results showed that students' perception of the use of Google Earth was in an outstanding category (mean = 4.29), particularly in the affective aspect, which reflected high interest and enthusiasm for Google Earth. However, the technology and accessibility aspects obtained the lowest score (mean = 3,968), indicating that there are still infrastructure barriers and limited access to technology. Therefore, it is necessary to develop a learning model based on constructivist theory, supported by technological approaches and improving spatial intelligence, as well as encouraging a more inclusive education policy and continuous training for students so that somebody can optimize the use of geospatial media such as Google Earth can be optimized in improving students' spatial literacy and problem-solving skills.

Keywords: *Google Earth, GIS, Remote Sensing, Spatial Literacy, Educational Technology*

INTRODUCTION

The use of maps in the learning process of Social Science (IPS) students is now receiving increasing attention in education. Where the map is one of the visual aids that has an essential role in the Remote Sensing course (Khuril 'ain, 2024). The use of Google Earth learning tools is an aspect of science and technology (Science and Technology), so it can assist students in learning activities that are in line with the progress of the times. The function of Google Earth learning media significantly supports the social studies education process for students, especially in materials related to maps (Putri Amelia, 2023). Therefore, this draws the attention of researchers to the need to understand context in teaching related to space. According to Song (2021), Geographic Information Systems (GIS) play a significant role in understanding the relationships between space, location, and social phenomena. Advances in GIS technology have significantly shaped the way humans view their environment and have expanded its applications across various disciplines. According to Indhirawati (2023), Google Earth provides a dynamic and interactive platform that enables students to explore geographic areas remotely, thereby enhancing their engagement and interest in learning activities.

Although the use of digital technology in the classroom can enhance interactive learning, challenges such as inadequate infrastructure and insufficient student training may hinder its successful incorporation (Purnomo et al., 2021). By adopting a more innovative and varied approach to utilizing digital tools for classroom learning, students are likely to advocate for increased government support to enhance digital facilities and in-person instruction (Swandi et al., 2024).

Students' perspective on the use of Digital Maps and Google Earth: They are generally open and adaptable to learning about geographic information systems through digital technologies such as Google Earth in remote sensing courses; despite their ease of acclimatization to digital technology, students state that the lack of interactive methodologies in the classroom makes the subject feel less interesting, hence the need for innovative teaching approaches (Junior et al., 2020). By allowing students to explore locations virtually, Google Earth provides an interactive learning experience that deepens their understanding of spatial context in remote sensing courses (Dewi & Hariadi, 2024).

Many students still have a low level of Geographic Information System (GIS) literacy in supporting the learning process, so they lack problem-solving skills, hence the need to provide detailed instructions to students about the stages of learning and using Google Earth, which shows that a better knowledge of this tool can further improve problem-solving (Fahmi, 2023). Thus, Google Earth can provide a learning experience that demonstrates how a better understanding of this tool can further enhance problem-solving, allowing the use of digital maps to extend beyond conventional map learning methods (Indhirawati et al., 2023).

Several studies have identified technology accessibility and student skills as obstacles, but no solutions have been proposed (Purnomo et al., 2021). Other studies have

also shown that trials have not been conducted in groups with lower levels of spatial intelligence from the outset (Kartadireja, 2024). There has been no research that comprehensively examines the perception of prospective social studies educator students towards the use of Google Earth and digital maps in Remote Sensing learning, especially those that combine quantitative analysis of five aspects of learning and critically consider technological barriers and spatial literacy. Therefore, develop a learning model that can overcome technological barriers and students' digital skills, namely by utilizing constructivist learning theory, which emphasizes that knowledge is actively constructed by individuals based on their experiences and interactions with the environment (Firdaus, 2023), as well as technology-based learning theory and spatial intelligence theory. The purpose of this study was to determine the application of Digital Maps and Google Earth (Geographic Information Systems) in remote sensing courses and to determine the strengths and challenges of using Digital Maps and Google Earth (Geographic Information Systems) based on students' perspectives in remote sensing courses.

METHOD

This study employs a quantitative method with descriptive statistics, as it aims to describe students' perceptions of using digital maps (Google Earth) in the Remote Sensing course. The instrument used was a questionnaire with a Likert scale of 5 points (1 = strongly disagree to 5 = strongly agree); the questionnaire consisted of 50 statements that measured five main aspects: knowledge (cognitive), attitude (affective), skills (psychomotor), academic relevance, and access to technology. The questionnaire was then distributed to students in the sixth semester of the geography concentration within the Social Science Education study program who had taken the Remote Sensing course. Thus, the sample consisted of 26 respondents. Students in the sixth semester are not targeted as respondents because they have not used Google Earth. The data were analyzed descriptively using simple statistics, including mean, minimum, and maximum percentages. The analysis was carried out to determine the tendency of student perceptions in each aspect studied.

RESULT AND FINDINGS

Result

Table 1. Summary of Final Results

No	Variabel	Mean	Min	Max	Std. Dev
1	Student Perception (X)	4,29	2	5	0,258304
2	Effectiveness of Google Earth (Y)	3,968	2	5	0,285422

Source : Data Analysis, 2025

Students' Perceptions of Google Earth

An average score of 4.29 indicates that Social Studies Education students have a highly positive perception of utilizing Google Earth in the Remote Sensing course. Suggests that students possess a strong understanding of the functions and advantages of digital maps and GIS, particularly in enhancing the learning process within the Social Sciences. They also exhibit positive affective traits—such as strong interest, curiosity, and enthusiasm—when engaging with these technologies. Moreover, students demonstrate solid practical (psychomotor) abilities by independently navigating and utilizing various features in Google Earth. These results align with the study by Putri, P. H., & Sriyanto, S. (2022), which found that incorporating Google Earth into geography instruction significantly enhances students' geographical competencies compared to traditional teaching methods.

Google Earth's Effectiveness Is Still Moderate-High

With an average score of 3.97, the use of Google Earth falls into the high effectiveness category, although it has not yet reached its full potential. The relatively low standard deviation (0.285) indicates that respondents' perceptions of its effectiveness were generally consistent. However, a minimum score of 2 suggests that a small portion of students may face challenges or limitations. Several factors can influence the effectiveness of Google Earth, including technological accessibility, as not all devices are able to run the application smoothly (based on indicators P41–P50). In addition, students' digital skills also play a role; while many show enthusiasm, not all are familiar with the more advanced technical features. This finding aligns with the research by Kartadireja (2024), which indicates that the use of GIS-based media in geography learning has a positive impact on the development of thinking skills and spatial reasoning.

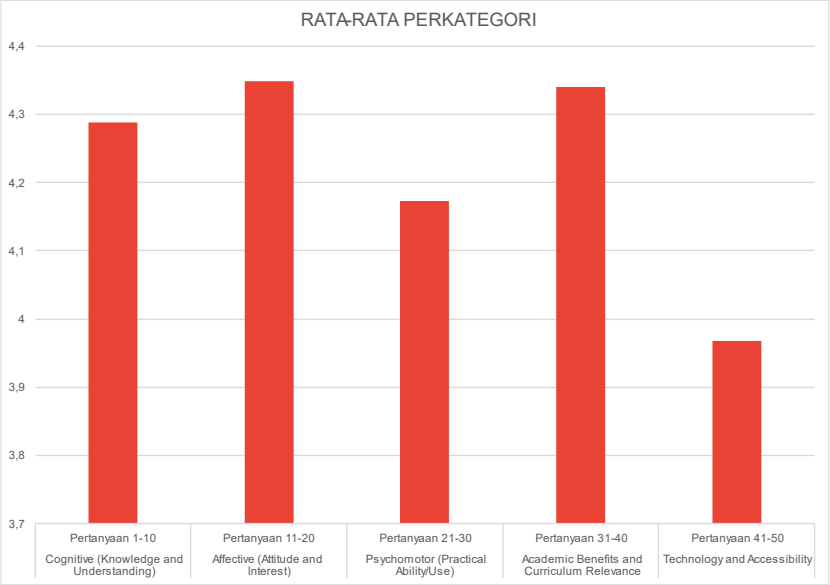
Findings

Table 2. Average Score Per Learning Aspect

No	Aspects	Indicator	Average per Category
1	Cognitive (Knowledge and Understanding)	1-10	4,288
2	Affective (Attitude and Attraction)	11-20	4,348
3	Psychomotor (Practical/Usable	21-30	4,173
4	Ability) Academic Benefits and Curriculum	31-40	4,341
5	Relevance Technology and Accessibility	41-50	3,068

Source : Data Analysis, 2025

Picture 1. Bar Chart of Average Scores per Learning Aspect



Source : Data Analysis, 2025

Knowledge and Understanding

The results showed that the cognitive aspect obtained an average score of 4.2, which showed that Google Earth helped improve their understanding of spatial concepts in the Remote Sensing course. Students demonstrated that the visualization of digital maps and interactive features in Google Earth facilitated their knowledge of landforms, land cover, and spatial differences between regions. These findings support the theory of Constructivism, which is an approach that aims to enhance student understanding. In learning theory, Constructivism emphasizes student involvement in addressing problems that arise (Kukuh, 2021). In this case, Google Earth can increase students' motivation to learn, as evidenced by their interest in taking remote sensing courses that

utilize Google Earth and their willingness to tackle problems that stimulate spatial analysis (Santoso, 2022).

Student Attitudes and Interests

The affective component had the highest score, indicating that Google Earth was successful in engaging students and enhancing their interest in the learning process. This outcome is consistent with González González and Pisabarro (2024), who found that employing map-based teaching strategies and geographical technologies can enhance student engagement and deepen their understanding of spatial concepts. Furthermore, Jaeger (2024) claims that utilizing Google Earth in schools has been shown to develop pupils' spatial reasoning abilities and promote STEM-based learning by facilitating an understanding of regional patterns.

Practical/Usability

In the psychomotor aspect, students achieved an average score of 4.1, indicating that they have a good ability to operate Google Earth. Students can navigate, zoom, measure distances, and analyze spatial displays relatively easily. Shows that the use of this technology supports the development of practical skills in interpreting spatial data. Supports the theory that spatial sensitivity in Social Science education students is known to make it easier for them to plan learning approaches, models, strategies, and techniques efficiently and effectively. Someone can develop their spatial thinking ability with the help of spatial thinking ability test instruments (Aliman, 2020). In addition, these findings also support the constructivist theory that emphasizes that an external reality may not be understood in the same way by different learners. As individual and social experiences play a crucial role in the learning process, the focus of social studies is on perspective rather than external truth (Yakar, 2020).

Academic Benefits and Curriculum Relevance

This category also received a high score of 4.3, indicating that students consider Google Earth to be highly relevant to the content of the Remote Sensing course curriculum. Students stated that lecture materials become more concrete, easy to understand, and applicable when associated with digital maps. These findings align with Hsu's (2021) research, which shows a significant increase in spatial thinking skills and mental rotation, supporting the importance of spatial intelligence in digital map-based geography education. Another finding, as examined by Alfatikh (2020), is that the use of Google Earth can improve students' engagement and geography learning outcomes at the secondary level. Results showed an increase in active participation (>75%) and learning scores (average 80%). In this case, by utilizing Google Earth, students are more actively involved in the learning process because Google Earth offers an engaging visual and tactical experience. It can improve their understanding of the material taught and strengthen information retention (Ali, 2024).

Technology and Accessibility Aspects

The technical and access features of this study, though, garnered the worst mean score. That implies, particularly in resource-limited regions, technological obstacles, including a lack of internet access, inadequate infrastructure, and insufficient equipment, persist as significant problems. According to Swandi (2024), the unequal use of educational technology in underserved areas is related to intermittent power outages, a lack of digital resources, and inadequate infrastructure. Thus, more inclusive policies and equal infrastructure are needed to support students ' access to technology-based media, even when they show great interest. This finding is in line with the theory of Technology-Based Learning, which is well-designed and creative learning by utilizing Information and Communication Technology within certain limits that will increase the possibility of students learning more, instill what they learn better, and improve the quality of learning, especially in order to increase the achievement of competencies.

From a pedagogical perspective, integrating Google Earth with the advancement of digital education systems such as the 3TW framework (Nathan et al., 2025), which combines digital technology, pedagogical techniques, and instructor well-being to advance 21st-century learning, Therefore, in order for the learning process to be as efficient as possible, the use of technology-based media must go hand in hand with the growth of lecturers' abilities. Furthermore, improving problem-based learning strategies, which invite students to interpret data and apply hypotheses (Putera et al., 2024), is the use of geospatial media such as Google Earth. However, the efficacy of this approach depends on the continuous development of lecturers and the availability of resources. Therefore, to maintain the efficient use of Google Earth, lecturers can implement strategies such as encouraging students to use Google Earth outside of class hours, ensuring adequate technology availability at school, and organizing training sessions for students on the technical use of this application in learning (Ali, 2024). Thus, the application of Google Earth in the Remote Sensing course can run smoothly.

The factors that influence Google Earth media contribute to learning outcomes. First, the role of lecturers as directors in using Google Earth learning media must be combined with appropriate teaching methods so that students can effectively receive this media. Second, Google Earth media used in the Remote Sensing course enables students to gain a deeper understanding of spatial information through Google Earth images that cover the entire Earth's surface. Third, the high quality of the network in each university and the availability of devices owned by students support the successful use of Google Earth media, as this medium requires both devices and internet connections (Hakim, 2024). In the world of education, technology has played a role in influencing and overhauling the learning system, including the media used. Therefore, if students have difficulties with technology, they will have difficulty mastering information and also fall behind in getting various opportunities to grow (Berlilana, 2020).

CONCLUSION

This study aims to investigate the perspectives of Social Studies Education students on the use of Google Earth digital maps in the Remote Sensing course. Based on the results of data analysis, students have very positive perceptions, especially in cognitive, affective, and academic relevance aspects, each of which obtained the highest average score. That indicates that the use of Google Earth is highly beneficial in enhancing understanding, emotional engagement, and the contextual meaning of spatial materials. These results support the constructivist theory that emphasizes the importance of experiential learning and active interaction, aligning with the principles of technology-based learning and the development of spatial intelligence. However, the technology and accessibility aspects are still challenges that require institutional attention so that digital learning can run optimally. This study suggests that lecturers are increasingly integrating digital media into geography learning and conducting technical training to support student competence.

REFERENCE

Alfatikh, A., Fatmawati, N., & Rahayu, A. N. (2020). *Penerapan Google Earth untuk meningkatkan hasil belajar dan keterlibatan peserta didik pada materi bentuk muka bumi*. Jurnal Pendidikan Geografi Undiksha, 8(2), 102–110. http://ejournal.uin-malang.ac.id/index.php/jpips.

Ali, M. K., Kamal, A. L., Safitri, D., & Sujarwo, S. (2024). Penggunaan Google Earth dalam Pembelajaran IPS. Jurnal Teknologi Pendidikan, 1(4), 9. https://doi.org/10.47134/jtp.v1i4.379.

Aliman, M., Mutia, T., Halek, D. H., Hasanah, R., & Muhammad, H. H. (2020). Pengembangan Instrumen Tes Kemampuan Berpikir Spasial bagi Siswa SMA. Geodika: Jurnal Kajian Ilmu dan Pendidikan Geografi, 4(1), 1–10. http://e-journal.hamzanwadi.ac.id/index.php/gdk.

As'ad, A. M., & Abdullah, A. (n.d.). KONSEP PENGGUNAAN MEDIA PEMBELAJARAN BERBASIS TEKNOLOGI (Vol. 2, Issue 2). https://ejournal.insuriponorogo.ac.id/index.php/almikraj.

Beck, K. (2024). Surveys and questionnaires (pp. 225–227). Elsevier BV. https://doi.org/10.1016/b978-0-323-85663-8.00015-5.

Berlilana, B., Utami, R., & Baihaqi, W. M. (2020). Pengaruh Teknologi Informasi Revolusi Industri 4.0 terhadap Perkembangan UMKM Sektor Industri Pengolahan. Matrix : Jurnal Manajemen Teknologi Dan Informatika, 10(3), 87–93. https://doi.org/10.31940/matrix.v10i3.1930.

Dewi, A., & Hariadi, E. (2024). Pemanfaatan Google Earth sebagai Alat Bantu Pembelajaran Sejarah untuk Meningkatkan Prestasi Belajar Siswa. Jurnal Pendidikan Madrasah, 9(2), 201–206. https://doi.org/10.14421/jpm.2024.201-206.

Fahmi, M. R. (2023). Improving Problem-Solving Student Ability: Integrating Google Earth with SETS Model Learning for Effective Solutions. https://doi.org/10.18860/abj.v8i1.19699.

Firdaus, A., Sugilar, H., Hilda Zaini Aditya, A., Matematika, P., Sunan Gunung Djati Bandung Jalan Soekarno Hatta, U., Bandung, K., & Assasul Islamiyah Sukabumi Jl Cagak Cibatu Cikembar Sukabumi, Mt. (2023). Conferences Series Learning Class Teori Konstruktivisme dalam Membangun Kemampuan Berpikir Kritis. Gunung Djati Conference Series, 28. https://conferences.uinsgd.ac.id/.

González González, M. J., & Pisabarro, A. (2024). Developing a Holistic Strategy Based on GIS and Story Mapping for Learning and Communicating Geography. Journal of Settlements and Spatial Planning, 15(2), 109–119. https://doi.org/10.24193/jssp.2024.2.03.

Hakim, L. (n.d.). PENGARUH MEDIA PEMBELAJARAN GOOGLE EARTH TERHADAP KETERAMPILAN BERPIKIR GEOGRAFI DAN HASIL BELAJAR SISWA. 4(8), 2024. https://doi.org/10.17977/um065.v4.i8.2024.21.

Hsu, C.-Y., Tsai, M.-J., & Chen, C.-M. (2021). *The effect of a Google Earth-based 3D spatial learning environment on elementary students' spatial thinking and learning achievement*. British Journal of Educational Technology, 52(1), 246–263. https://doi.org/10.1111/bjet.12934.

Indhirawati, R., Ismaya, E. A., & Haq, M. D. (2023). Optimizing geospatial literacy: A qualitative exploration of Google Earth as an effective learning tool in primary education. Jurnal Scientia, 12(04), 1025–1029. https://doi.org/10.58471/scientia.v12i04.2072.

Jaeger, A. J. (2024). Google Earth as a Tool for Supporting Geospatial Thinking. Land, 13(12), 2218. https://doi.org/10.3390/land13122218.

Jovanović, D., & Stojković, S. (2024). Geography in the digital world: Web GIS. 485–492. https://doi.org/10.5937/kongef24054j.

Junior, L. M., Estevão, G. C., & Militz Wypyczynski Martins, R. E. (2020). Geografia e Google Earth na Sala de Aula: Proximidades, Diálogos e Aprendizagens. 31(2), 105–120. https://doi.org/10.5216/RP.V31I2.67098.

Kartadireja, W. N., Somantri, L., & Sugito, N. T. (2024). Penggunaan Media Berbasis Sistem Informasi Geografis untuk Meningkatkan Kecerdasan Spasial dalam Pembelajaran. Jurnal Penelitian Pendidikan Geografi, 9(3), 138–146. https://jppg.uho.ac.id/index.php/journal/article/download/127/55/686.

Khuril 'ain, F., Faisal Akbar, R., & Mufarricah, S. H. (2024). PETA SEBAGAI MEDIA PEMBELAJARAN: STRATEGI UNTUK HASIL YANG OPTIMAL DALAM IPS. *Jurnal Ilmu Sosial*, *5*. https://ejournal.undiksha.ac.id/index.php/triwikrama.

Kukuh, N., Pinton, M., Mustafa2, S., Negeri, S., & Malang, B. (2021). Ndaru Kukuh Masgumelar, Pinton Setya Mustafa Teori Belajar Konstruktivisme dan Implikasinya dalam Pendidikan dan Pembelajaran. https://siducat.org/index.php/ghaitsa.

Nathan, J., Mogare, J., Singh, P., & Gagare, K. (2025). 3TW Model for Enhancement of Teaching and Learning Experiences in the Digital Era. 236–245. https://doi.org/10.9734/bpi/mono/978-93-48859-10-5/ch22.

Ozcan, G., Singh, M., & Mortensen, E. M. (2023). Surveys and questionnaires (pp. 283–290). Elsevier BV. https://doi.org/10.1016/b978-0-323-88423-5.00097-2.

Purnomo, E., Juhadi, & Hardati, P. (2021). Pengaruh Pengetahuan dan Kendala terhadap Keterampilan dalam Pembuatan Media Pembelajaran Geografi Visualisasi Informasi Geospasial Pada Mahasiswa Pendidikan Geografi Universitas Negeri Semarang. Edu Geography, 9(3). Diakses dari http://journal.unnes.ac.id/sju/index.php/edugeo.

Putera, R. P., Baiti, N. H., & Meilina, A. P. (2024). Problem Solving Method In Improving Students' Critical Thinking Abilities In Social Studies Learning. International Journal of Educational Research, 1(3), 01–10. https://doi.org/10.62951/ijer.v1i3.41.

Putri Amelia, D., Oktafianti, M., Rustini, T., Studi Pendidikan Guru Sekolah Dasar, P., Pendidikan Indonesia, U., & Setiabudhi Jawa Barat, J. (2023). Pengaruh Penggunaan Media Google Earth terhadap Pembelajaran Peta di Sekolah Dasar. Journal on Education, 05(02). e: http://jonedu.org/index.php/joe.

Putri, P. H., & Sriyanto, S. (2022). Efektivitas Penggunaan Media Google Earth dalam Pembelajaran Geografi untuk Meningkatkan Keterampilan Geografi Siswa Kelas X Ips Sma Negeri 52 Jakarta. Edu Geography, 10(2), 15-34. https://doi.org/10.15294/edugeo.v10i2.60521.

Santoso, A. (2022). Pengaruh Media Pembelajaran Google Earth Terhadap Kemampuan Berpikir Spasial Siswa SMA. Geodika: Jurnal Kajian Ilmu Dan Pendidikan Geografi, 6(2), 152–162. https://doi.org/10.29408/geodika.v6i2.5998.

Song, W., & Wu, C. (2021). Introduction to advancements of GIS in the new IT era. Annals of GIS, 27(1), 1–4. https://doi.org/10.1080/19475683.2021.1890920.

Suasapha, A. H. (2020). SKALA LIKERT UNTUK PENELITIAN PARIWISATA; BEBERAPA CATATAN UNTUK MENYUSUNNYA DENGAN BAIK. JURNAL KEPARIWISATAAN, 19(1), 26–37. https://doi.org/10.52352/jpar.v19i1.407.

Swandi, A., Fauzan, A., Arsyad, S. N., & Rahmadhanningsih, S. (2024). Digital-Based Learning in Lagging Area: Students' Problems and Expectations. Al-Ishlah, 16(3), 3227–3236. https://doi.org/10.35445/alishlah.v16i3.2875.

YAKAR, U., SÜLÜ, A., PORGALI, M., & ÇALIŞ, N. (2020). From Constructivist Educational Technology to Mobile Constructivism: How mobile learning serves constructivism? International Journal of Academic Research in Education, 6(1), 56–75. https://doi.org/10.17985/ijare.818487.