



ANALYSING THE INVISIBLE BARRIERS: STUDENT UNDERSTANDING AND CONTEXTUAL OBSTACLES IN GEOGRAPHY ONLINE LEARNING

Andri Estining Sejati^{1*}, Nasarudin², Putri Tipa Anasi³, La Ode Muhammad Ruspan Takasi⁴, Mimin Mintarsih⁵, Jaynudin⁶, Resti Karmila⁷, La Ode Nursalam⁸

^{1,2,6}Universitas Sembilanbelas November Kolaka, Kolaka, Indonesia

³Universitas Tanjungpura, Pontianak, Indonesia

⁴Universitas Terbuka, Kendari, Indonesia

⁵Institut Agama Islam Rawa Aopa Konawe Selatan, Konawe, Indonesia

⁷SMAN 1 Tanah Pinoh, Nanga Pinoh, Indonesia

⁸Universitas Halu Oleo, Kendari, Indonesia

*Corresponding Author: 📧 anes.um36@gmail.com

Article History

Received : 26/02/2026

Revised : 18/06/2026

Accepted : 01/07/2026

Keywords:

Digital divide, Geography education, Learning obstacle, Online learning, Student understanding.

Abstract. Online learning poses significant challenges to conceptual understanding in geography, particularly in rural Indonesian settings characterized by infrastructure and social limitations. This study aims to analyze the level of student understanding and identify fundamental obstacles in online geography learning at Senior High School State 2 Mawasangka Tengah. A quantitative approach was employed involving 25 Class X Social Science students and one geography teacher. Data were collected via essay tests (10 items on soil formation and distribution) and unstructured interviews. Data analysis utilized descriptive quantitative methods with percentages. Student understanding levels were categorized as high (32%; 8 students), medium (44%; 11 students), and low (24%; 6 students), with the medium category being dominant. Major obstacles included low internal learning motivation (laziness), language barriers in understanding instructional Indonesian, group learning adaptation issues, limited learning time allocation (90 minutes), social environment influences, and digital infrastructure limitations. There is a critical need for adaptive online geography instruction that addresses student disengagement, language barriers, time constraints, and socio-environmental factors to enhance conceptual understanding in future online learning implementations.

How to Cite: Sejati, A. E., Nasarudin, N., Anasi, P. T., Takasi, L. O. M. R., Mintarsih, M., Jaynudin, J., Karmila, R., & Nursalam, L. O. (2026). ANALYSING THE INVISIBLE BARRIERS: STUDENT UNDERSTANDING AND CONTEXTUAL OBSTACLES IN GEOGRAPHY ONLINE LEARNING. *Prima Magistra: Jurnal Ilmiah Kependidikan*, 7(3), 566-579. <https://doi.org/10.37478/jpm.v7i3.7717>

Correspondence address:

Jl. Pemuda No. 339 Kelurahan Tahoa Kolaka Sulawesi

Tenggara, 93517, Indonesia. 📧 alishodikin@unesa.ac.id

Publisher:

Program Studi PGSD Universitas Flores. Jln. Samratulangi, Kelurahan Paupire, Ende, Flores.

✉ primagistrauniflor@gmail.com

INTRODUCTION

Education constitutes a fundamental human necessity that continuously evolves in response to advancements across various domains of life, encompassing pedagogical methods, educator competencies, and infrastructural facilities (Bakar & Asri, 2025; Niazi, 2025). Nevertheless, the pandemic and subsequent government mandates have accelerated a transformation towards online learning, relying heavily on digital platforms to ensure educational continuity (Kemendikbud, 2020; Moodley et al., 2022). While online learning offers flexibility and accessibility, its implementation has highlighted a digital divide that risks exacerbating educational inequalities, particularly between urban and rural regions (BPS, 2019; Golden et al., 2023). In Indonesia, Ministry of Education and Culture Circular No. 4 of 2020 emphasized flexibility and relevance; yet, empirical evidence suggests that many institutions prioritized material continuity over the depth and effectiveness of the learning process (Hongsuchon et al., 2022; Permendikbud-4, 2020).

This shift profoundly affects student comprehension levels. Ideal pedagogy should foster conceptual understanding through guidance rather than rote memorization for assessment purposes (Bannour et al., 2021; Xhomara & Dasho, 2023). However, preliminary observations indicate that online learning is often implemented suboptimally, merely satisfying administrative requirements rather than educational goals (Dagoy et al., 2024). This is particularly detrimental in geography education, which relies heavily on spatial reasoning, visualization, and field-based contextualization, elements that are difficult to fully translate into constrained online

environments (Sejati et al., 2022). When educators assign tasks without profound conceptual explanation, student engagement diminishes, potentially hindering the achievement of mandated graduation competencies.

These challenges are compounded in rural locales such as Central Buton Regency. BPS (2019) data indicates lower mobile phone usage among rural students (64.69%) compared to their urban counterparts (76.60%), significantly affecting accessibility. At Senior High School State 2 Mawasangka Tengah, the issue is exacerbated by adapted learning schedules and fully online modalities. Students report instructional methods that prioritize workload over conceptual clarity, alongside infrastructure barriers such as network instability and internet quota limitations (Lu & Tian, 2023). If unaddressed, these conditions significantly impede the understanding of complex geographical concepts, such as soil formation and distribution, which require deep analytical engagement.

Recent empirical studies have consistently demonstrated that online learning effectiveness is significantly compromised in resource-constrained settings. Previous research revealed that the digital divide during the pandemic exacerbated educational inequities, with rural students experiencing lower engagement rates compared to their urban counterparts (Dhaygude et al., 2022; Smith et al., 2024). In the Indonesian context identified multi-dimensional challenges in technology-based social science learning, including inadequate teacher preparedness, limited student digital literacy, and socio-economic barriers (Hasmin et al., 2026; Rasimin et al., 2024; Sambo et al., 2025). Online learning environments in developing countries often fail to accommodate students' diverse linguistic backgrounds and learning preferences, leading to superficial understanding rather than deep conceptual mastery (Golzar et al., 2024; Martin & Graulich, 2024; Samuel, 2024). These studies collectively underscore that while technological infrastructure remains a critical concern, the intersection of pedagogical, linguistic, and socio-cultural factors creates a complex web of obstacles that cannot be addressed through technical solutions alone.

Several studies have investigated online learning challenges, predominantly focusing on technical and infrastructural barriers. For instance, research by Dhaygude et al. (2022) and Zhang et al. (2022) extensively mapped the digital divide and policy implementation during the pandemic. Meanwhile, studies on science and geography education, such as those by Aroonsrimarakot et al. (2022) and Wang (2022) have highlighted the difficulties in translating spatial reasoning and field-based contexts into virtual environments. However, a significant lacuna persists in understanding the nuanced, non-technical barriers within rural Indonesian contexts. Existing literature rarely investigates how geography-specific conceptual understanding is affected by the confluence of localized obstacles, specifically, instructional language barriers (where formal Indonesian intersects with local vernacular comprehension), restricted learning time, and unique socio-environmental factors. This study bridges this gap by shifting the focus from mere technological access to the socio-pedagogical and linguistic complexities that hinder deep conceptual engagement.

Consequently, this study scrutinizes the level of student understanding and obstacles in geography online learning at Senior High School State 2 Mawasangka Tengah. The study has two primary objectives: first, to determine the level of student understanding in geography online learning; and second, to analyze the specific internal and external obstacles hindering this understanding. Theoretically, this research contributes to the literature on situated learning and rural education by providing empirical evidence on how linguistic and socio-environmental factors intersect with digital learning in geography. Practically, the findings offer an evidence-based framework for educators and policymakers to design adaptive, context-responsive online geography instruction that transcends mere technological provision, ultimately addressing student disengagement and conceptual misconceptions in under-resourced settings.

RESEARCH METHODS

This research employed a quantitative approach with a descriptive design to assess students' comprehension levels, complemented by qualitative data derived from interviews to explore



learning obstacles in depth. This design was selected to provide an objective overview of geography students' understanding conditions and the contextual factors influencing them during online learning. The research was conducted at State Senior High School 2 Mawasangka Tengah, administratively located in Watorumbe Bata Village, Mawasangka Tengah District, Central Buton Regency, Southeast Sulawesi Province. Primary data collection was carried out during the 2020-2021 academic year, coinciding with the implementation of online learning during the pandemic. Supporting data and teacher information validation were extended until the 2025-2026 period to ensure the relevance and contemporaneity of the findings.

The population of this research comprised all Grade 10 Social Studies (IPS) students at State Senior High School 2 Mawasangka Tengah. A total sampling (census) technique was employed, wherein all 25 students from Class X IPS 1 were established as research subjects. The selection of this class was based on the consideration that Grade 10 students represent the initial adaptation phase to basic geography material at the secondary education level. Additionally, one geography teacher was engaged as a subject for interview data.

First instrument is 10 essay questions is adjusted to the amount of material in the subject matter. Compiling this test question is based on Bloom's taxonomy with the types of questions Knowledge (C1) and Understanding (C2). It is adjusted to the essential competencies and main topics of geography subjects in high school. Class XI and class XII, whose way of thinking is considered high, it is hoped that students can understand simple relationships between facts or concepts (Liu et al., 2024; Yassin, 2024). Essential competencies contain content or competencies consisting of attitudes, knowledge, and skills sourced from core competencies that students must master (Sumarmi, 2015). The second instrument was an interview guide. This guide was utilized to delve into detailed information regarding learning obstacles. Although initially designed as unstructured to obtain naturalistic data, the data were subsequently grouped based on obstacle themes during analysis for combining with test results.

Data collection was conducted in two stages. First, an online test in the form of essay questions was distributed via the online learning platform used by the school. Students were allocated a specific time to answer, and responses were collected digitally. Second, interviews were conducted with the geography teacher to confirm observational obstacles in the field. In-depth interviews were performed to obtain qualitative information regarding technical constraints, student motivation, and the social environment. This study adhered to academic ethical principles, including obtaining permission from the school administration, securing informed consent from research subjects, and guaranteeing the anonymity of student identities in data reporting (using initials).

Data analysis in this research is descriptive with percentages. First, record the results of students' answers to all the researcher's questions. Second, assessing the results of students' answers to all questions. The following is the percentage formula: $Pb = Xb/N \times 100$ (Description: Pb = Score of students who answered correctly for all questions, Xb = Frequency of students who answered correctly for all questions, N = Total number of correct answer) (Arikunto, 2011). Third, create a table grouping the level of student understanding from the assessment results of students who answered correctly from all questions given, with the Arikunto (2011) criteria, shown in the Table 1.

Table 1. Student Understanding Level Scale

Level of Understanding	Score
High	76 – 100
Medium	60 – 75
Low	0 – 59

Unstructured interview data with geography subject teachers at Senior High School State 2 Mawasangka Tengah were analyzed using quantitative description. Analysis will be conducted to determine the obstacles to students' understanding levels in geography online learning.

RESULTS AND DISCUSSION

Understanding is essential to learning because it can develop students' understanding of



each learning material. Table 2 below presents the results of the analysis of the level of students' understanding during online learning for class X Social I students of Senior High School State 2 Mawasangka Tengah.

Table 2. List of Grades of Students' Understanding Level of Class X Social 1

No	Student Initial	Grade	Category	No	Student Initial	Grade	Category
1.	Al	87	High	14.	JP	55	Low
2.	An	65	Average	15.	Ja	57	Low
3.	AT	74	Average	16.	Li	85	High
4.	Ar	75	Average	17.	NF	93	High
5.	Di	70	Average	18.	NS	85	High
6.	Du	50	Low	19.	Ol	65	Average
7.	Ef	80	High	20.	Ri	70	Average
8.	Er	55	Low	21.	Sa	57	Low
9.	FF	95	High	22.	Sr	85	High
10.	FR	69	Average	23.	Ta	70	Average
11.	Hu	70	Average	24.	TA	50	Low
12.	IS	93	High	25.	YY	73	Average
13.	IN	68	Average				

Understanding is a critical aspect of supporting student achievement in teaching and learning. The level of student understanding will be categorized as high if there are factors within the student, namely the student's ability to motivate themselves to learn. Motivation is essential for the level of student understanding (Diwakar et al., 2023; Espinoza et al., 2024). In addition to factors within the student, understanding is also influenced by external factors such as a good social environment (Anisa et al., 2025; Chen et al., 2023).

Students of Senior High School State 2 Mawasangka Tengah Class X Social 1 who obtained high category scores were eight students with a percentage of 32%. The level of understanding in the high category during the online learning was influenced by students' motivation to follow the learning process even though they were studying online. However, some students were still constrained in online learning through internet networks and communication devices/cellphones owned by students. In learning activities, intellectual factors are one of the successes in increasing understanding and factors within students, namely, a person's ability to motivate themselves (Dadandi & Yazıcı, 2024; Strobel et al., 2024). Motivation is essential in learning activities because motivation encourages enthusiasm for learning, which has a good effect on students' level of understanding (Espinoza et al., 2024).

The reason students get a high level of understanding is influenced by the students' motivation to follow the learning process during online learning. Intellectual factors are not only one of the successes in increasing understanding but also factors within students, namely the students' ability to motivate themselves in learning that is carried out online (Dong et al., 2023; García-Machado et al., 2024). Students can become inactive in conveying their aspirations and thoughts, considering that learning during online learning is carried out online, making learning tedious and impacting student learning outcomes (Amin et al., 2024; Han et al., 2023). The level of understanding will be achieved well when there is student motivation in learning, and this is supported by external factors such as family involvement and a good community environment, which can affect student understanding (Kurniawan et al., 2023; Ma, 2024).

Internal factors, including motivation in learning, and external factors, including family and community environment, will significantly influence student understanding. Learning motivation is essential in supporting student learning achievement because a drive within students causes learning activities (Acosta-Gonzaga & Ramirez-Arellano, 2022; Daniel et al., 2024). The level of understanding is also influenced by external factors outside the student that affect learning outcomes, including family, school, and community (Chen et al., 2023; Levinson & Cohen, 2023).

The 25 students of Senior High School State 2 Mawasangka Tengah class X Social I who got moderate category scores were 11 students, with a percentage of 44%. The level of student understanding in the moderate category is because the learning material carried out during the learning process carried out online is not studied repeatedly, so students do not understand the



learning material. Students study the material again when faced with exams or tests so that the results of student learning achievement and understanding levels can be categorized as moderate.

Students get a moderate level of understanding because of the lack of interest in learning materials that seem tedious, primarily since learning during online learning is carried out online. Student interest is vital in learning because interest is a sense of attraction, a greater desire for something. The issue of student interest in subjects will affect student learning achievement because learning achievement is significant in supporting student self-confidence. The level of student understanding is categorized as high, medium, and low and must also be supported by a student's interest in learning materials. Interest is a high tendency, passion, or great desire for something (Gómez & Rivas, 2022; Zulfiqar et al., 2023).

A student's interest in a subject or how a teacher teaches is essential and influences student learning achievement. Other factors, such as inadequate network conditions and economic limitations, are why they cannot afford to buy internet quotas when learning is carried out online (Lu & Tian, 2023; Ramadani & Simamora, 2022). The absence of a cell phone as a tool to support learning will affect the level of understanding or student learning achievement (Chen et al., 2023; Lu & Tian, 2023). Learning achievement is a test to measure students' skills or level of understanding (Tong & Li, 2025).

The level of understanding is a crucial benchmark in assessing students' learning achievement within the teaching and learning process. However, this understanding often falls into a low category due to various internal and external factors. Internally, students may exhibit a lack of motivation or laziness in engaging with the online learning process, which hinders their ability to grasp and retain knowledge. Externally, challenges arise from the need for teachers to implement creative and engaging learning strategies, as well as from infrastructural issues like inadequate network conditions and limited internet quotas. These external factors play a significant role in supporting or undermining the overall effectiveness of the learning process, emphasizing the need for comprehensive solutions to improve educational outcomes (Chen et al., 2023).

Students of Senior High School State 2 Mawasangka Tengah, class X Social I, who got a low score category, were six students with a percentage of 24%. The low level of student understanding that affects learning outcomes is one reason for the need for renewal and how to deliver material to students during online learning. One of the factors that determines the quality of students' level of understanding is that teachers must be creative in the online learning process. This factor is also in line with other factors, such as students' laziness in participating in the online learning process, inadequate networks, and limited internet quotas owned by students, so students experience delays in learning materials (Matsieli & Mutula, 2024).

During online learning, the low level of student understanding, which significantly impacts learning outcomes, highlights the need for innovative approaches in teaching methods. Teachers play a pivotal role in enhancing students' comprehension by adapting their delivery techniques to align with the changing educational landscape. Factors such as the shift to online or hybrid learning, reduced face-to-face interaction, and increased reliance on technology necessitate a renewal of teaching strategies to maintain engagement and comprehension. Creative and adaptive learning models, as suggested by Jahring et al. (2022), are essential to address these challenges. By employing interactive, technology-driven, and student-centered approaches, teachers can foster a deeper understanding and improve the overall quality of education during this transitional period. Adequate network and internet quota conditions and lazy students participating in online learning also contribute to low student understanding (Rasimin et al., 2024).

Understanding is a benchmark of competence students achieve in learning process activities. The student's understanding process will vary in understanding the material during online learning. Teachers must renew or engage in creative learning in the teaching and learning process (Davies, 2023; Putri et al., 2023). Another factor that can support the level of understanding is the condition of the network, and the internet quota must be adequate because it dramatically supports the online learning process (Han & Kumwenda, 2024). The laziness factor also affects student understanding (Jarczewski, 2024). Students should also be able to motivate



themselves to follow the online learning process, and the role of the family is needed in supervising and advising student development in achieving successful learning achievements.

The time condition factor also dramatically affects geography learning because it is done online. This learning is one of the reasons for the allocation of learning time during the online learning being limited to 90 minutes in one meeting. Time allocation is needed to achieve a specific basic competency, considering the effective week and the number of competencies per semester (Sumarmi, 2015; Wang, 2022).

The analysis of student understanding in geography learning during online learning in Senior High School State 2 Mawasangka Tengah, class X Social I, reveals varied levels of comprehension among the 25 students assessed. Results indicate that 32% of students, or eight individuals, achieved a high level of understanding, while the majority, comprising 44% or 11 students, demonstrated a medium level of understanding. Additionally, 24%, equating to six students, fell into the low understanding category. These findings suggest that the overall level of student understanding in geography for this class predominantly aligns with the medium category, as reflected by the largest percentage of students achieving this level.

Reflection on the study results above shows that online learning has advantages and disadvantages. Online learning can be applied as a variation of offline learning. Implementing online learning pays attention to weaknesses, such as devices and networks, to maximize student understanding of the material (Fang et al., 2023; Kaufmann & Vallade, 2022). Online learning has advantages in implementing distance learning and can include various media and platforms such as Edmodo and Quiziz (Miftachurohmah et al., 2022; Sejati et al., 2021). The benefits of online learning mean that this learning can be used at any time (Matsieli & Mutula, 2024).

Table 3. Results of Interviews with Geography Teachers of Class X Social I

Nu	Indicator	Information Obtained	Theme Found
1.	Unable to master the material according to the specified time.	Limited time will affect students' understanding level with the online learning process because while in the face-to-face learning process, only some students understand the material, especially in pandemic conditions, learning time is also limited.	The limited learning time during the online learning hinder students' understanding level.
2.	Low level of understanding compared to group mates.	Issues like this depend on the students because students' abilities also vary; teachers only provide solutions by dividing groups where students with poor understanding will be grouped with students with high knowledge.	Activities in the teaching and learning process must involve group divisions; in group divisions, some students have low scores one group with high score and affect the spread of understanding.
3.	Not achieving learning achievement.	1. Lack of understanding of Indonesian so that when explaining learning materials, it is not understood. 2. Lack of motivation or enthusiasm to follow the online learning process. 3. Limited learning time during online learning is also an obstacle to understanding.	The obstacles to students' level of understanding during online learning affect students' learning achievement.
4.	Social environmental factors.	The problem with students' social environments is how they adapt, in terms of what is good for their development and what is bad. If students cannot choose what is good or bad, it will impact their character and understanding.	Social and environmental factors or students' social circles hinder students' level of understanding.

Obstacles to understanding level are problems that cause students' learning achievement to be lower than expected. Obstacles to understanding arise due to internal factors (within the students) and external factors (social environment), which are obstacles for students, causing them difficulty in learning and understanding the material. The Table 3 are the interview results



describing obstacles to students' understanding of geography teaching during the online learning implementation.

Obstacles to students' understanding levels vary due to limited learning time, indicating that students cannot master the material according to the specified time. Students are lazy in following the learning process contained in the learning achievement indicator according to their abilities. Social and environmental factors included in the community environment indicator include being impolite, stubborn, and not adapting to the environment (Sejati et al., 2023).

First, obstacles to students' understanding levels are reviewed based on the inability to master the material with limited learning time. The data obtained by researchers shows that obstacles to students' understanding levels are evaluated from the indicator of not being able to master the material with limited learning time during online learning. The transition to online learning during implementation has further highlighted challenges in education, as many students who struggled to understand material during face-to-face instruction faced additional obstacles in virtual settings (Busby et al., 2024). The online learning shift to remote education has exacerbated difficulties in student comprehension, underscoring the need for innovative strategies to bridge learning gaps (Engzell et al., 2021; Solihat et al., 2022). Learning during online learning significantly changed from direct learning. Online learning also affects the allocation of learning time, the learning process have to limit the learning process time to 90 minutes and improve the teaching process, motivation to learn, and more parental attention (Carrillo & Flores, 2022; Marshall et al., 2022). Changes in time allocation certainly force educators to be more creative in implementing a fun learning process, which can affect student understanding (Iskandar et al., 2024; Taufiqurohman et al., 2022). The shift to online learning and the restrictions imposed during online learning have significantly impacted student comprehension, particularly in geography subjects. According to interviews with teachers, the challenges stem from limited learning time and inadequate internet connectivity, which hinder active participation and engagement from students. These obstacles contribute to a passive learning attitude among students, reducing their ability to grasp complex concepts effectively. Consequently, teachers are compelled to adopt innovative and creative teaching strategies to maintain students' interest and bridge the gap in understanding caused by these limitations (Assali, 2024). This situation highlights the need for improved infrastructure and dynamic teaching methods to ensure effective learning outcomes in challenging circumstances (Chen, 2024; Suyu-Vega et al., 2024).

Second, the teaching and learning process must be divided into groups, and in one group, there is a student whose learning outcomes are low compared to his group friends; problems like this can affect students' learning motivation they can and hinder the level of student understanding. According to the geography subject teacher, the problem depends on how the students are because the students' abilities to understand the material vary. The teacher is a mentor who distributes study groups; even when dividing the group, the teacher groups students with a high level of understanding with students with a lower level of understanding. The student's willingness to improve their learning methods is the key to group learning (Sejati et al., 2023; Wangdi et al., 2024).

Third, obstacles to student understanding are reviewed based on the indicator that students cannot achieve learning achievements according to their abilities. The data obtained by the researcher shows that obstacles to the level of student understanding are reviewed from the indicator that students cannot achieve learning achievements according to their abilities because students have difficulty digesting Indonesian when the teacher explains the material. Students do not understand the analysis or thinking questions, and there is a lack of enthusiasm for students to follow the learning process. Student learning achievement or level of understanding can improve if the learning process is not tedious, especially during online learning, because each student has different abilities to understand the material, such as translating, interpreting, and extrapolating (Salas et al., 2024; Sun et al., 2024). These obstacles are also challenges in implementing learning during online learning because they are related to the level of student understanding, which will affect student learning achievement (Yu, 2022; Zhu et al., 2023).

The online learning process should ideally still be able to foster student enthusiasm for



participating in it. Learning should continue to make students understand the learning material so that their learning achievements are achieved according to their abilities, such as capturing the meaning of their learning (Dong et al., 2025; Singh et al., 2022). Learning achievement is a test standard for measuring skills or knowledge for someone in one or more lines of work or study (Tong & Li, 2025).

Efforts to improve student understanding certainly have obstacles, especially during online learning, which affects student learning achievement. The results of the interview showed that several factors hindered the level of student understanding. Students had problems understanding the Indonesian language, so it was not understood when explaining the learning material. There was no motivation or enthusiasm to follow the online learning process, inadequate networks, and limited learning time, which resulted in poor student learning achievement (Guo et al., 2023; Kaymak & Horzum, 2022).

Fourth, obstacles to student understanding were reviewed from social environmental indicators. The data obtained by researchers shows that obstacles to students' level of understanding regarding social and environmental indicators can also affect their level of understanding. Social and environmental factors can have a positive influence and can also have a negative impact. Few students experience increased learning outcomes because the impact of the social environment or friends they hang out with can motivate them to learn (Vit et al., 2024). Factors such as the availability of networks, cell phones, and internet quotas are also very important to support the smooth running of online learning (Govender & Albin, 2023; Kannan et al., 2024; Lazaro & Duarte, 2023).

The social environment has a negative and positive impact if the social environment or friends the students hang out with are good and foster a spirit of learning. The social environment or friends will greatly influence student understanding; therefore, if students are not wise in responding to this. The social environment is an area where various social interactions occur between various groups, and symbols and values of norms have been set (González, 2024).

Motivation in following the learning process is an effort to improve student understanding. Good environmental factors must also follow student motivation because it can affect their understanding if students cannot control themselves in the social environment. The results of the interview showed that the problem of the social environment that can hinder the level of student understanding is how students can respond to what is good and bad. If students fall into a nasty social environment, it will impact their understanding and learning achievement (Stenseng et al., 2022; Zhang & Qian, 2024).

The research findings on the analysis of students' understanding levels in geography learning during online learning in Senior High School State 2 Mawasangka Tengah reveal that the Class X Social I students largely fall within the moderate category, with 44% or 11 the students, demonstrating this level of understanding. This indicates that nearly half of the class faces challenges in fully comprehending the subject matter. Further investigation into the obstacles reveals that these challenges are influenced by both internal factors, such as motivation, learning styles, and individual readiness, and external factors, including the quality of online learning infrastructure, teacher-student interaction, and environmental distractions. These findings emphasize the need for targeted strategies to address these barriers and enhance student comprehension during periods of educational disruption (Harianingsih & Jusoh, 2023).

Factors that need to be considered in implementing online learning after the pandemic. Internal factors that influence obstacles to the level of understanding are students' lack of motivation or enthusiasm to participate in the online learning process and the lack of students digesting Indonesian when explaining the material (Rasimin et al., 2024). External factors can also hinder students' understanding levels, such as limited online learning time, poor social environments or places, and lack of motivation to learn from the family environment (Gu, 2022; Levinson & Cohen, 2023).

CONCLUSIONS AND SUGGESTIONS

The highest level of student understanding during online learning is in the moderate



category with 11 students or 44%. Factors that hinder the level of student understanding during online learning are laziness in following the online teaching and learning process, lack of understanding of Indonesian when the teacher explains the material, limited learning time, adaptation to group learning, and the influence of a less than good social environment can affect the level of student understanding. The dominant obstacle that affects the level of student understanding is the lack of student learning motivation towards the online learning process. This study implies the need for adaptive online geography instruction that addresses student disengagement, language barriers, limited learning time, and socio-environmental factors to improve conceptual understanding in future online learning. The obstacles of learning motivation must be considered before implementing online learning in the future.

REFERENCES

- Acosta-Gonzaga, E., & Ramirez-Arellano, A. (2022). Scaffolding Matters? Investigating Its Role in Motivation, Engagement and Learning Achievements in Higher Education. *Sustainability*, 14(20), 13419–13419. <https://doi.org/10.3390/su142013419>
- Amin, A. M., Rabiei, M., Amirkhiz, S. Y. Y., & Shomoossi, N. (2024). We are Still to Learn from Our Learners: A Hidden Curriculum Developed during The Covid-19 Pandemic. *Teaching and Teacher Education*, 137, 104390. <https://doi.org/10.1016/j.tate.2023.104390>
- Anisa, S., Setiadi, R., Nurullah, M., & Rasyid, H. (2025). Dissecting School Dynamics as A Social Interaction System: Social Networks, Power, and Identity at Junior High School. *Leadership*, 6(2), 235–249. <https://doi.org/10.32478/leadership.v6i2.3755>
- Arikunto, S. (2011). *Dasar-Dasar Evaluasi Pendidikan*. Jakarta: PT. Bumi Aksara. <https://books.google.co.id/books?id=j5EmEAAQBAJ&printsec=copyright&hl=id#v=onepage&q&f=false>
- Aroonsrimarakot, S., Laiphrakpam, M., Chathiphot, P., Saengsai, P., & Prasri, S. (2022). Online Learning Challenges In Thailand and Strategies to overcome The Challenges from The Students' Perspectives. *Education and Information Technologies*, 28(7), 1–18. <https://doi.org/10.1007/s10639-022-11530-6>
- Assali, M. A. (2024). Enhancing Pedagogical Creativity: A Comprehensive Study of Self-Professional Development among ESL Educators. *Research Journal in Advanced Humanities*, 5(2), 12–28. <https://doi.org/10.58256/et4a4a30>
- Bakar, N. A. A., & Asri, S. F. M. (2025). Continuous Learning Throughout Life and across various domains. *Digital Transformation and Sustainability in Higher Education*, 277–302. <https://doi.org/10.4018/979-8-3373-5077-6.ch011>
- Bannour, R., Tarchoun, S., Dhouib, W., Ben cheikh, A., Bhiri, S., Ghali, H., Tlilli, M., khfacha, S., Said Latiri, H., & Ben Rejeb, M. (2021). Evidence-based Practice Among Health Students: Attitudes, Knowledge, Skills and Perceived Barriers. *European Journal of Public Health*, 31(Supplement_3), 509. <https://doi.org/10.1093/eurpub/ckab165.450>
- BPS. (2019). *Potret Pendidikan Statistik Pendidikan Indonesia 2019*. Jakarta: Badan Pusat Statistik. <https://www.bps.go.id/id/publication/2019/11/29/1deb588ef5fdbfba3343bb51/potret-pendidikan-statistik-pendidikan-indonesia-2019.html>
- Busby, S., Espiritu, E. W., Noven, M. Vanden, Mills, J. R., & Hunt, J. W. (2024). The Impact and Process of Transition from Face-to-Face to Online Teaching During a Pandemic: A Grounded Theory Approach. *Online Learning*, 28(3), 445–473. <https://doi.org/10.24059/olj.v28i3.3964>
- Carrillo, C., & Flores, M. A. (2022). Online Teaching and Learning Practices in Teacher Education after COVID-19: Lessons Learnt from The Literature. *Journal of Education for Teaching*, 49(5), 1–13. <https://doi.org/10.1080/02607476.2022.2153018>
- Chen, B. (2024). A Framework for Infrastructuring Sustainable Innovations in Education. *Journal of the Learning Sciences*, 33(3), 583–612. <https://doi.org/10.1080/10508406.2024.2320159>
- Chen, D. P., Chang, S. W., Burgess, A., Tang, B., Tsao, K. C., Shen, C. R., & Chang, P. Y. (2023).



- Exploration of The External and Internal Factors that Affected Learning Effectiveness for the Students: A Questionnaire Survey. *BMC Medical Education*, 23(1), 49. <https://doi.org/10.1186/s12909-023-04035-4>
- Chen, L., Luan Wong, S., & How, S. P. (2023). A Systematic Review of Factors Influencing Student Interest in Online Homework. *Research and Practice in Technology Enhanced Learning*, 18, 39–39. <https://doi.org/10.58459/rptel.2023.18039>
- Dadandi, İ., & Yazıcı, H. (2024). Cognitive Ability or Motivation, or Both: An Integrative Path Analysis of The Interplay Between Two Key Factors in Academic Achievement. *British Educational Research Journal*, 50(5), 2342-2362. <https://doi.org/10.1002/berj.4027>
- Dagoy, T. K. S., Ariban, A. I., Chavez, J. V., Garil, B. A., Abdurasul, S. A. M., Hayudini, M. A. A., Haiber-Asari, J., Pawaki, A. E. H., Tantalie, E. M., Alih, D. R. S., & Abduraup, R. D. (2024). Discourse Analysis on The Teachers' Professional Interest and Integrity Among Teachers with Multiple Administrative Functions. *Environment & Social Psychology*, 9(12), 1-17. <https://doi.org/10.59429/esp.v9i12.2521>
- Daniel, K., Msambwa, M. M., Antony, F., & Wan, X. (2024). Motivate Students for better Academic Achievement: A Systematic Review of Blended Innovative Teaching and Its Impact on Learning. *Computer Applications in Engineering Education*, 32(4), e22733. <https://doi.org/10.1002/cae.22733>
- Davies, L. M. (2023). The Ongoing Crises Facing Teacher Education: Reclaiming Creativity and Rethinking Knowledge Post-Pandemic. *Journal of Education for Teaching*, 50(2), 1–15. <https://doi.org/10.1080/02607476.2023.2260765>
- Dhaygude, M. S., Lapsiya, N. D., & Chakraborty, D. (2022). There is No App for that: Manifestations of The Digital Divides During COVID-19 School Closures in India. *Proceedings of the ACM on Human-Computer Interaction*, 6(CSCW2), 1–26. <https://doi.org/10.1145/3555140>
- Diwakar, S., Kolil, V. K., Francis, S. P., & Achuthan, K. (2023). Intrinsic and Extrinsic Motivation Among Students for Laboratory Courses - Assessing The Impact of Virtual Laboratories. *Computers & Education*, 198, 104758. <https://doi.org/10.1016/j.compedu.2023.104758>
- Dong, J., Sun, R., Yan, Z., Shi, M., & Bi, X. (2025). Research on Learning Achievement Classification Based on Machine Learning. *PLOS ONE*, 20(6), e0325713. <https://doi.org/10.1371/journal.pone.0325713>
- Dong, X., Yuan, H., Xue, H., Li, Y., Jia, L., Chen, J., Shi, Y., & Zhang, X. (2023). Factors Influencing College Students' Self-Regulated Learning in Online Learning Environment: A systematic Review. *Nurse Education Today*, 133, 106071. <https://doi.org/10.1016/j.nedt.2023.106071>
- Engzell, P., Frey, A., & Verhagen, M. D. (2021). Learning Loss Due to School Closures during The COVID-19 Pandemic. *Proceedings of the National Academy of Sciences of the United States of America*, 118(17), e2022376118. <https://doi.org/10.1073/pnas.2022376118>
- Espinoza, Ó., Miranda, C., Sandoval, L., Corradi, B., González, L., & McGinn, N. (2024). Determinants of Study Motivation of Undergraduate University Students in Chile. *Studies in Higher Education*, 50(6), 1–15. <https://doi.org/10.1080/03075079.2024.2363512>
- Fang, S., Lu, Y., & Zhang, G. (2023). External and Internal Predictors of Student Satisfaction with Online Learning Achievement. *Online Learning*, 27(3), 339–362. <https://doi.org/10.24059/olj.v27i3.3627>
- García-Machado, J. J., Martínez Ávila, M., Dospinescu, N., & Dospinescu, O. (2024). How The Support that Students Receive during Online Learning Influences Their Academic Performance. *Education and Information Technologies*, 29, 20005–20029. <https://doi.org/10.1007/s10639-024-12639-6>
- Golden, A. R., Srisarajivakul, E. N., Hasselle, A. J., Pfund, R. A., & Knox, J. (2023). What was A Gap is Now A Chasm: Remote Schooling, The Digital Divide, and Educational Inequities Resulting from The COVID-19 Pandemic. *Current Opinion in Psychology*, 52, 101632. <https://doi.org/10.1016/j.copsyc.2023.101632>



- Golzar, J., Yacoub, O., & McKinley, J. (2024). E-learning Successes with English Language Teachers in Under-resourced Non-WEIRD Contexts. *International Journal of Applied Linguistics*, 34(3), 1159–1182. <https://doi.org/10.1111/ijal.12557>
- Gómez, G., & Rivas, M. (2022). Reading Achievement, Resilience, and Motivation in Contexts of Vulnerability: A Study of Perceived Self-Efficacy, Intrinsic Motivation, and Family Support in Chile. *Reading Psychology*, 43(5–6), 357–379. <https://doi.org/10.1080/02702711.2022.2106333>
- González, R. (2024). The Role of Norms as A Promoter of Social Change. *Political Psychology*, 46(2), 455–481. <https://doi.org/10.1111/pops.13025>
- Govender, R. G., & Albin, S. (2023). Online Learning: Experiences of Namibian students Relying on Smartphones. *African Identities*, 23(2), 1–16. <https://doi.org/10.1080/14725843.2023.2251699>
- Gu, J. (2022). Impact of Living Conditions on Online Education: Evidence from China. *Sustainability*, 14(6), 3231–3231. <https://doi.org/10.3390/su14063231>
- Guo, Y., Liu, Z., Meng, X., & Yin, H. (2023). Unravelling The Relationship between Student Engagement and Learning Outcomes in Emergency Online Learning: A Synthesis of Quantitative and Qualitative Results. *Assessment & Evaluation in Higher Education*, 48(8), 1–14. <https://doi.org/10.1080/02602938.2023.2214345>
- Han, J., DiGiacomo, D. K., & Usher, E. L. (2023). College Students' Self-Regulation in Asynchronous Online Courses during COVID-19. *Studies in Higher Education*, 48(9), 1–15. <https://doi.org/10.1080/03075079.2023.2201608>
- Han, S. P., & Kumwenda, B. (2024). Bridging The Digital Divide: Promoting Equal Access to Online Learning for Health Professions in An Unequal World. *Medical Education*, 59(1), 56–64. <https://doi.org/10.1111/medu.15455>
- Harianingsih, I., & Jusoh, Z. (2023). Overcoming Challenges of Online Learning: A Study on Undergraduates' Preparedness during The Covid-19 Pandemic. *Jurnal Tatsqif*, 21(1), 98–123. <https://doi.org/10.20414/jtq.v21i1.7248>
- Hasmin, H., Nurung, J., Nas, W., Latief R, A., & Hasmin Tamsah, M. Z. A. F. (2026). Designing Contextual Digital-Skills Training for Low-Resource Communities: Evidence from coastal Youth in South Sulawesi. *Information Development*. <https://doi.org/10.1177/02666669251413702>
- Hongsuchon, T., El Emary, I. M. M., Hariguna, T., & Qhal, E. M. A. (2022). Assessing The Impact of Online-Learning Effectiveness and Benefits in Knowledge Management, The Antecedent of Online-Learning Strategies and Motivations: An Empirical Study. *Sustainability*, 14(5), 2570–2570. <https://doi.org/10.3390/su14052570>
- Iskandar, S., Rosmana, P. S., Laksita, E. C., Sari, T. F. P., & Laila, W. N. (2024). Implementation of Integrated Learning to Enhance Elementary School Students' Creativity. *Journal of Pedagogy*, 1(3), 14–19. <https://ejournal-nawalaedu.com/index.php/jop/article/view/406>
- Jahring, J., Herlina, H., Nasruddin, N., & Astrinasari, A. (2022). Pengembangan Instrumen Evaluasi Pembelajaran Matematika Berbasis Online Menggunakan Aplikasi Quizizz. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 11(2), 872–881. <https://doi.org/10.24127/ajpm.v11i2.4932>
- Jarczewski, D. (2024). Exempting Oneself from Knowing Better. Epistemic Laziness and Conspiracy Theories. *Social Epistemology*, 1–13. <https://doi.org/10.1080/02691728.2024.2438114>
- Kannan, K. B. N., Overby, E., & Narasimhan, S. (2024). Can Improvements to Mobile Internet Service Help Reduce Digital Inequality? An Empirical Analysis of Education and Overall Data Consumption. *Management Science*, 71(7), 5419–6318. <https://doi.org/10.1287/mnsc.2022.03770>
- Kaufmann, R., & Vallade, J. I. (2022). Maximizing The Student Experience: Moving Forward with Online Learning. *Communication Education*, 71(2), 152–154. <https://doi.org/10.1080/03634523.2021.2022730>
- Kaymak, Z. D., & Horzum, M. B. (2022). Student Barriers to Online Learning as Predictors of



- Perceived Learning and Academic Achievement. *The Turkish Online Journal of Distance Education*, 23(2), 97–106. <https://doi.org/10.17718/tojde.1096250>
- Kemendikbud. (2020). *Surat Edaran Kemdikbud No 4 Tahun 2020. Mengenai Pelaksanaan Pendidikan Dalam Masa Darurat Corona Virus Disease (Covid19)*. Jakarta: Kemendikbud. <https://bpmppkalteng.kemendikdasmen.go.id/surat-edaran-mendikbud-4-2020-pelaksanaan-kebijakan-pendidikan-dalam-masa-darurat-penyebaran-corona-virus-disease-covid-19>
- Kurniawan, F., Yeni Erita, Didi Syahrir, & Vani Qhairum Nisa Utami. (2023). The Influence of Students' Environment on Students' Learning Motivation. *Journal of Digital Learning and Distance Education*, 1(8), 297–305. <https://doi.org/10.56778/jdlde.v1i8.58>
- Lazaro, G. R. de, & Duarte, J. M. (2023). Moving Learning: A Systematic Review of Mobile Learning Applications for Online Higher Education. *Journal of New Approaches in Educational Research*, 12(2), 198–224. <https://doi.org/10.7821/naer.2023.7.1287>
- Levinson, M., & Cohen, A. K. (2023). Social Determinants of Learning: Implications for Research, Policy, and Practice. *AERA Open*, 9. <https://doi.org/10.1177/23328584231206087>
- Liu, J., Liu, Z., Wang, C., Xu, Y., Chen, J., & Cheng, Y. (2024). K-12 Students' Higher-Order Thinking Skills: Conceptualization, Components, and Evaluation Indicators. *Thinking Skills and Creativity*, 52, 101551. <https://doi.org/10.1016/j.tsc.2024.101551>
- Lu, G., & Tian, M. (2023). The Influences of Online Learning Environments, Self-Efficacy, and Interaction on Learning Achievement: The Case of International Students in China. *Interactive Learning Environments*, 32(7), 1–22. <https://doi.org/10.1080/10494820.2023.2172045>
- Ma, Y. (2024). Analysis Learning Motivation from Internal and External Perspectives: Recommendations Based on Maslow's Hierarchy of Needs Theory. *Proceedings of the 2nd International Conference on Social Psychology and Humanity Studies*, 39(1), 119–125. <https://doi.org/10.54254/2753-7048/39/20240688>
- Marshall, D. T., Pressley, T. M. F., & Love, S. M. (2022). The Times they are A-changin': Teaching and Learning beyond COVID-19. *Journal of Educational Change*, 23(4), 549–557. <https://doi.org/10.1007/s10833-022-09469-z>
- Martin, P. P., & Graulich, N. (2024). Beyond Language Barriers: Allowing Multiple Languages in Postsecondary Chemistry Classes Through Multilingual Machine Learning. *Journal of Science Education and Technology*, 33(3), 333–348. <https://doi.org/10.1007/s10956-023-10087-4>
- Matsieli, M., & Mutula, S. (2024). COVID-19 and Digital Transformation in Higher Education Institutions: Towards Inclusive and Equitable Access to Quality Education. *Education Sciences*, 14(8), 819–819. <https://doi.org/10.3390/educsci14080819>
- Miftachurohmah, N., Miftachurohmah, N., Nasruddin, N., Jahring, J., Sugiarto, A., Anasi, P. T., Syarifuddin, S., & Sejati, A. E. (2022). Implementation of the Creative Problem Solving (CPS) Learning Model Based on Information and Communication Technologies (ICT) to Improve Mathematics Learning Outcomes. *Prisma Sains: Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika dan IPA IKIP Mataram*, 10(4), 872–880. <https://doi.org/10.33394/j-ps.v10i4.5828>
- Moodley, C., Seerane, T., & Gravett, S. (2022). Learning at Home for Grade 1 Learners in Disadvantaged Communities: Insights from The Sandbox@Home COVID-19-response Intervention. *South African Journal of Childhood Education*, 12(1). <https://doi.org/10.4102/sajce.v12i1.1046>
- Niazi, A. (2025). Education is The Foundation of Individual Growth and Social Progress. *Integrated Journal for Research in Arts and Humanities*, 5(4), 80–83. <https://doi.org/10.55544/ijrah.5.4.11>
- Permendikbud-4. (2020). *Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 4 Tahun 2020 tentang Perubahan Atas Peraturan Menteri Pendidikan dan Kebudayaan Nomor 88 Tahun 2014 Tentang Perubahan Perguruan Tinggi Negeri Menjadi*



- Perguruan Tinggi Negeri Badan Hukum. Jakarta: Kemendikbud. <https://peraturan.bpk.go.id/details/163707/permendikbud-no-4-tahun-2020>
- Putri, I. G. A. P. E., Widdop Quinton, H., & Selkrig, M. (2023). Reshaping Teaching in Higher Education through A Mandala of Creative Pedagogies. *Teaching in Higher Education*, 29(8), 2075–2094. <https://doi.org/10.1080/13562517.2023.2193665>
- Ramadani, D., & Simamora, S. S. (2022). The Learning Environment and Students' Learning Interest in Online Learning. *Science Education*, 11(1), 86–86. <https://doi.org/10.24235/sc.educatia.v11i1.10139>
- Rasimin, Semma, A. B., Zakiyuddin, Ali, M., & Helmy, M. I. (2024). Multi-dimensional Challenges in The Indonesian Social Science Information Technology-based Learning: A Systematic Literature Review. *Heliyon*, 10(7), e28706. <https://doi.org/10.1016/j.heliyon.2024.e28706>
- Salas, J. L., Wang, X. W., Tucker, M. C., & Son, J. Y. (2024). Memorization and Performance During Pandemic Remote Instruction: Evidence of Shifts from an Interactive Textbook. *Online Learning*, 28(2), 1-34. <https://doi.org/10.24059/olj.v28i2.3435>
- Sambo, K. U., Shishah, W., & Isiaku, L. (2025). Barriers to Gamification Adoption in Education: A Systematic Review of Cultural, Technological, and Institutional Challenges in Developing Countries. *Information Development*. <https://doi.org/10.1177/02666669251331268>
- Samuel, A. (2024). Decolonizing Online Learning: A Reflective Approach to Equitable Pedagogies. *Distance Education*, 45(3), 1–7. <https://doi.org/10.1080/01587919.2024.2338720>
- Sejati, A. E., HL, N. I., Sugiarto, A., Anasi, P. T., Hariyadi, E., Nasruddin, N., & Kasmianti, S. (2023). The Effect of Practicum Methods on Geographic Information System Learning Outcomes and Students' Activeness in Senior High School. *E3S Web of Conferences*, 400, 01012. <https://doi.org/10.1051/e3sconf/202340001012>
- Sejati, A. E., Nasarudin, N., Karim, A. T. A., Sugiarto, A., Harianto, E., & Sarwan, S. (2023). Faktor-Faktor yang Mempengaruhi Hasil Belajar Geografi secara Daring: Studi Siswa SMA Negeri 1 Samaturu, Sulawesi Tenggara. *Jambura Geo Education Journal*, 4(1), 68–76. <https://doi.org/10.34312/jgej.v4i1.18863>
- Sejati, A. E., Sugiarto, A., Anasi, P. T., Utaya, S., & Bachri, D. S. (2022). Tantangan filsafat Geografi dalam Perkembangan Geografi Terkini: Kajian Ontologi, Epistemologi, Aksiologi, dan Etika. *Majalah Geografi Indonesia*, 36(2), 126–134. <https://doi.org/10.22146/mgi.74942>
- Sejati, A. E., Syarifuddin, S., Nasruddin, N., Miftachurohmah, N., Nursalam, L. O., & Hariyanto, E. (2021). The Effectiveness of Guided Inquiry Learning Model with Edmodo Assisted to Facilitate Critical Thinking Skills. *Prisma Sains: Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika dan IPA IKIP Mataram*, 9(2), 204–219. <https://doi.org/10.33394/j-ps.v9i2.4260>
- Singh, N., Gunjan, V. K., Mishra, A. K., Mishra, R. K., & Nawaz, N. (2022). SeisTutor: A Custom-Tailored Intelligent Tutoring System and Sustainable Education. *Sustainability*, 14(7), 4167. <https://doi.org/10.3390/su14074167>
- Smith, A. J., Devine, D., Samonova, E., Capistrano, D., Sugrue, C., Sloan, S., Symonds, J., Gibbons, R., & Folan, A. (2024). The COVID-19 Pandemic and Children's Engagement with Learning in Rural Sierra Leone. *Cambridge Journal of Education*, 54(2), 221–237. <https://doi.org/10.1080/0305764x.2024.2336144>
- Solihat, A. N., Sadiyah, A., & Gumilar, G. (2022). Pengaruh Pembelajaran Daring terhadap Learning Loss dan Implikasinya terhadap Learning Outcome. *Jurnal Inovasi Pendidikan Ekonomi (JIPE)*, 12(1), 12–22. <https://doi.org/10.24036/011167270>
- Stenseng, F., Tingstad, E. B., Wichstrøm, L., & Skalicka, V. (2022). Social Withdrawal and Academic Achievement, Intertwined Over Years? Bidirectional Effects from Primary to Upper Secondary School. *British Journal of Educational Psychology*, 92(4), 1354–1365. <https://doi.org/10.1111/bjep.12504>



- Strobel, A., Strobel, A., Preckel, F., & Steinmayr, R. (2024). On The Interplay of Motivational Characteristics and Academic Achievement: The Role of Need for Cognition. *AERA Open*, 10. <https://doi.org/10.1177/23328584231218961>
- Sumarmi. (2015). *Model-model Pembelajaran Geografi*. Malang: Aditya Media Publishing. <https://www.belbuk.com/modelmodel-pembelajaran-geografi/produk/42009>
- Sun, D., Looi, C. K., Yang, Y., & Jia, F. (2024). Exploring Students' Learning Performance in Computer-supported Collaborative Learning Environment during and After Pandemic: Cognition and Interaction. *British Journal of Educational Technology*, 56(1), 128-149. <https://doi.org/10.1111/bjet.13492>
- Suyo-Vega, J. A., Fernández-Bedoya, V. H., & Meneses-La-Riva, M. E. (2024). Beyond Traditional Teaching: A Systematic Review of Innovative Pedagogical Practices in Higher Education. *F1000Research*, 13, 22. <https://doi.org/10.12688/f1000research.143392.1>
- Taufiqurohman, T., Nurihsan, J., & Rachmawati, Y. (2022). Analysis of Factors that Influence Students' Enjoyable Learning in Class: A Literature Review. *Qalamuna: Jurnal Pendidikan, Sosial dan Agama*, 14(1), 513-528. <https://doi.org/10.37680/qalamuna.v14i1.4360>
- Tong, T., & Li, Z. (2025). Predicting Learning Achievement using Ensemble Learning with Result Explanation. *PLOS ONE*, 20(1), e0312124. <https://doi.org/10.1371/journal.pone.0312124>
- Vit, E., Bianchi, F., Castellani, M., & Takács, K. (2024). Friends Can Help to Aim High: Peer Influence and Selection Effects on Academic Ambitions and Achievement. *Journal of Early Adolescence*, 45(9). <https://doi.org/10.1177/02724316241273427>
- Wang, C.-H. (2022). Comprehensively Summarizing what Distracts Students from Online Learning: A Literature Review. *Human Behavior and Emerging Technologies*, 2022, 1-15. <https://doi.org/10.1155/2022/1483531>
- Wangdi, N., Wangmo, Y., Penjor, & Tshering, K. (2024). Enhancing Class X Students' Learning in Geography through Collaborative Approach. *Asian Journal of Advanced Research and Reports*, 18(12), 460-472. <https://doi.org/10.9734/ajarr/2024/v18i12843>
- Xhomara, N., & Dasho, A. (2023). Online Interactions and Student Learning Outcomes in A Moodle-based E-learning System. *Technology, Pedagogy and Education*, 32(4), 1-15. <https://doi.org/10.1080/1475939x.2023.2214576>
- Yassin, E. (2024). Examining The Relation of Open Thinking, Critical Thinking, Metacognitive Skills and Usage Frequency of Open Educational Resources Among High School Students. *Thinking Skills and Creativity*, 52, 101506. <https://doi.org/10.1016/j.tsc.2024.101506>
- Yu, Z. (2022). Sustaining Student Roles, Digital Literacy, Learning Achievements, and Motivation in Online Learning Environments during the COVID-19 Pandemic. *Sustainability*, 14(8), 4388-4388. <https://doi.org/10.3390/su14084388>
- Zhang, L., Carter, R. A., Qian, X., Yang, S., Rujimora, J., & Wen, S. (2022). Academia's Responses to Crisis: A Bibliometric Analysis of Literature on Online Learning in Higher Education during COVID-19. *British Journal of Educational Technology*, 53(3), 620-646. <https://doi.org/10.1111/bjet.13191>
- Zhang, X., & Qian, W. (2024). The Effect of Social Support on Academic Performance Among Adolescents: The Chain Mediating Roles of Self-efficacy and Learning Engagement. *PLOS ONE*, 19(12), e0311597. <https://doi.org/10.1371/journal.pone.0311597>
- Zhu, X., Gong, Q., Wang, Q., He, Y., Sun, Z., & Liu, F. (2023). Analysis of Students' Online Learning Engagement during The COVID-19 Pandemic: A Case Study of a SPOC-Based Geography Education Undergraduate Course. *Sustainability*, 15(5), 4544. <https://doi.org/10.3390/SU15054544>
- Zulfiqar, N., Shafi, M. T., & Ajmal, R. (2023). Academic Achievement of First-Generation University Students in Spotlight: Role of Parental Involvement, Autonomy Support, and Academic Motivation. *Journal of College Student Retention: Research, Theory and Practice*, 27(1). <https://doi.org/10.1177/15210251231160774>

