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The Effectiveness of the CORE (Connecting, Organizing, Reflecting, Extending) Learning Model on Disaster Mitigation Material to Improve Students' Learning Outcomes in Geography at Senior High School

Achmad Yusuf [1] (Universitas Negeri Surabaya, Indonesia)
Mar'atus Sholihah [2] (Universitas Negeri Surabaya, Indonesia)
Rizqina Awaliyah [3] (Universitas Negeri Surabaya, Indonesia)
Afiqoh Billah Izzah [4] (Universitas Negeri Surabaya, Indonesia)

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Abstract

This experiment aims to analyze the effectiveness of Connecting, Organizing, Reflecting, Extending (CORE) learning model in improving students learning outcomes on disaster mitigation material in Geography subjects at the Senior High School level. The research employed a quantitative approach with a quasi-experimental design of the Non-equivalent Control Group Design type, involving two classes: an experimental class treated with the CORE model and a control class using conventional learning. The research sample consisted of eleventh-grade students from SMAN 1 Driyorejo, Gresik Regency, selected through purposive sampling and cluster random sampling techniques. Data were collected through pretests and posttests, then analyzed using normality tests, homogeneity tests, and independent sample t-tests. The results showed a significant difference between the learning outcomes of students in the experimental and control classes, with a Sig. (2-tailed) = 0.000 < 0.05, indicating that the CORE model had a significant effect on improving students learning outcomes. The CORE model was considered effective because it actively engaged students through the stages of connecting prior knowledge, organizing concepts, reflecting, and extending understanding within real-life contexts. Therefore, the CORE learning model is deemed feasible to be applied as an innovative alternative to enhance students learning outcomes and conceptual understanding in disaster mitigation material.

Keywords: CORE Model, Disaster Mitigation, Learning Outcomes, Geography Learning.

1. INTRODUCTION

Senior high school education represents a critical stage in the development of students' competencies cognitive, affective, and psychomotor. The national curriculum identifies students' learning outcomes at the senior high school level as a key indicator of instructional success, which also reflects the quality of future human resources. However, numerous studies have shown that students' learning outcomes remain suboptimal, particularly in terms of conceptual understanding, critical thinking, communication, and problem-solving skills. Meaningful learning requires connecting prior and new knowledge, organizing ideas, encouraging reflection, and extending students' understanding. Through the connecting phase, students are guided to link new knowledge with prior understanding. The Organizing phase helps students structure their knowledge systematically. In the Reflecting phase, students are trained to restate and internalize the information they have acquired. Finally, during the Extending phase, students are encouraged to broaden their knowledge through active discussion (Herfina, 2018). The CORE learning model (Connecting, Organizing, Reflecting,

Corresponding Author: maratussholihahamrullah@gmail.com

Extending) is a relatively new and promising alternative learning approach. This model emphasizes four main stages: Connecting (linking prior knowledge with new concepts), Organizing (structuring ideas or concepts systematically), Reflecting (encouraging students to evaluate and deepen their understanding), and Extending (applying and expanding knowledge in broader contexts). Consequently, the CORE model promotes student-centered learning that is active, reflective, and meaningful. Several studies have reported positive effects of the CORE model on various aspects of learning. For example, research conducted at SMP Negeri 206 Jakarta revealed that the implementation of the CORE model significantly improved students' mathematical connection skills(Nugroho, 2019). imilarly, a study at SMAN 5 Banjarmasin found that the CORE learning model positively influenced students' performance in solving higher-order thinking skills (HOTS) problems on calculus applications (Ansori & Suryaningsih, 2020). Despite these promising findings, research explicitly exploring the effectiveness of the CORE model in the senior high school context remains relatively limited. Most studies have focused on junior high school levels or mathematics-related topics. In contrast, at the senior high school level, learning challenges become more complex, requiring students not only to understand concepts but also to apply, analyze, evaluate, and create. Therefore, further research is needed to examine the effectiveness of the CORE learning model in enhancing senior high school students' learning outcomes, particularly in terms of conceptual mastery, application, and knowledge development.

Indonesia, as an archipelagic country located at the convergence of three major tectonic plates the Indo-Australian, Eurasian, and Pacific plates has one of the highest levels of disaster vulnerability in the world. Natural disasters such as earthquakes, floods, volcanic eruptions, landslides, and tsunamis frequently occur across various regions. Data from the National Disaster Management Agency (BNPB, 2024) show that over the past three years, the number of disaster events in Indonesia has continued to increase, with more than 3,500 cases annually, most of which have affected the education sector. This condition highlights the importance of disaster mitigation education in schools, particularly at the senior high school level, to ensure that students possess the preparedness, knowledge, and skills necessary to respond to potential disaster risks in their environments.

In geography learning, particularly in disaster mitigation topics, several challenges remain. The learning process is often theoretical, teacher-centered, and insufficiently linked to the students' surrounding environment. Students tend to memorize the types of disasters and their mitigation steps without fully understanding the cause-and-effect relationships or real-world applications of these concepts in daily life. Consequently, students' learning outcomes both in cognitive and affective aspects remain relatively low. This situation underscores the need for innovative learning approaches that promote active participation, conceptual understanding, and reflective thinking about disaster-related issues.

One potential learning model that can be applied in the context of disaster mitigation education is the CORE learning model (Connecting, Organizing, Reflecting, Extending). Introduced by Calfee and Patrick (1995), this model is designed to help students construct understanding through four key stages: Connecting (linking prior experiences or knowledge with new concepts), Organizing (structuring ideas and information logically), Reflecting (engaging in reflection on learning outcomes and acquired understanding), and Extending (developing and applying knowledge in real-life contexts).

2. METHOD

This study employed a quantitative approach with a quasi-experimental design, which refers to a type of experimental research conducted in an authentic learning context without full randomized participation. The primary objective of this research was to examine the effectiveness of the CORE learning model on students' learning outcomes at SMAN 1 Driyorejo, Gresik Regency. The study utilized a Nonequivalent Control Group Design, involving two non-randomly selected classes: an experimental class that received instruction using the CORE learning model and a control class that was taught through conventional learning methods.

The population of this study consisted of all 11th-grade students at SMAN 1 Driyorejo, Gresik Regency, which served as the research site. The data collection technique used purposive sampling, selecting a school that met the research requirements and had teachers capable of implementing the CORE model. After the school was selected, the sample was obtained through cluster random sampling to choose two classes that were comparable in terms of academic ability. The experimental class used the CORE model, while the control class received conventional instruction. Each class consisted of approximately 30–35 students, resulting in a total sample of around 70 students.

The learning achievement test was developed based on the basic competency indicators specified in the current curriculum. Prior to its implementation, the test underwent content validity evaluation through expert judgment, while its reliability was assessed using Cronbach's Alpha coefficient, with a value of $\alpha \geq 0{,}70$ considered acceptable. The research procedure comprised three main phases: preparation, implementation, and data analysis. The preparation phase involved the development of instructional instruments and the administration of a pretest to identify students' initial learning achievement. The implementation phase was conducted over several sessions by applying the steps of the CORE learning model connecting, organizing, reflecting, and extending. Upon completion of the treatment, a posttest was administered to both groups to assess students' learning outcomes or final achievement levels.

The collected data were analyzed using SPSS software (specific version). Initially, a homogeneity test was conducted to determine whether the sample groups possessed equal variances. This was followed by a normality test to verify whether the samples were drawn from a normally distributed population. Subsequently, hypothesis testing was carried out on the data obtained from the research. The quantitative data analyzed in this study focused on students' learning achievement.

Research ethics were carefully observed by obtaining official authorization from the school, safeguarding the confidentiality of student data, and ensuring that the instructional intervention did not cause any harm to participants. The findings of this study are expected to provide a meaningful contribution to the advancement of innovative teaching practices and to serve as an empirical foundation for the implementation of the CORE learning model aimed at enhancing students' academic achievement at the senior high school level.

3. RESULTS AND DISCUSSION

Results

This study aimed to examine the differences in conceptual understanding between the CORE learning model (Connecting, Organizing, Reflecting, and Extending) and the conventional learning model in teaching disaster mitigation at the senior high school level. Following the administration of the pretest and posttest, the collected data were analyzed for normality using the Kolmogorov–Smirnov test. The normality test was conducted to verify whether the data were normally distributed. The results of the normality test are presented in Table 1.

Table 1. Results of the Normality

Pretest and Posttest Results	**One-Sample Kolmogorov-Smirnov Test**		
	Statistic	**Df**	**Sig (2-tailed)**
CORE	0,176	70	0,083
Conventional	0,206	70	

Based on Table 1, the results of the normality test conducted using the One-Sample Kolmogorov-Smirnov Test show a Sig (2-tailed) value of 0.083. Because this value exceeds the significance treshold of 0.05, the data can be considered to be normally distributed.

Table 2. Results of the Homogeneity

Students' Learning Outcomes	***Levene Statistic***	**df1**	**df2**	**Sig.**
	0,765	1	138	0,383

Based on the results of the homogeneity test using Levene's Test, a significance value of 0.383 ($p > 0.05$) was obtained. This indicates that the variance between the data groups does not differ significantly; therefore, it can be concluded that the data are homogeneous. After conducting both the normality and homogeneity tests, an independent samples t-test was subsequently performed.

Table 3. Result of Independent Sample t-test

Students' Learning Outcomes	**t**	**Df**	**Sig. (2- tailed)**
	4,264	138	0,000

Based on the results of the independent samples t-test, a Sig. (2-tailed) value of $0.000 < 0.05$ and a t-value of 4.264 were obtained. These results indicate a statistically significant difference; thus, the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. It can therefore be concluded that the implementation of the CORE learning model in the experimental class had a significant effect on students' learning outcomes.

Based on the results of this study, there is a significant effect on learning outcomes when implementing the CORE learning model (Connecting, Organizing, Reflecting, Extending) compared to the conventional learning model among students at SMAN 1 Driyorejo, Gresik Regency. Therefore, it can be stated that the CORE learning model is more effective than the conventional approach, which typically relies only on lecturing or group discussions. The CORE learning model has been shown to influence students' learning outcomes positively (Aswina, 2019). Moreover, the CORE model has been found to produce higher learning achievement (Crismono, 2024). Furthermore, the discussion of research findings (Zebua et al., 2024) also indicates that the CORE learning model is effective in enhancing students' learning outcomes. Accordingly, it can be concluded that the CORE model exerts a highly significant impact on students' academic performance compared to the conventional learning model. The effectiveness of the CORE model lies in its ability to actively engage students in the learning process through its structured phases connecting concepts, organizing

information, reflecting on understanding, and extending knowledge. As a result, the CORE learning model not only strengthens students' conceptual understanding but also cultivates their critical and reflective thinking skills. Therefore, the CORE model can be regarded as an innovative and effective instructional approach for improving students' learning outcomes at the senior high school level.

Discussion

The CORE (Connecting, Organizing, Reflecting, Extending) learning model has proven to be an effective teaching strategy, as demonstrated by the results of a study conducted at SMAN 1 Driyorejo, Gresik Regency. The study aimed to assess the impact of the CORE model on improving students' learning outcomes in disaster mitigation material within geography education (Muryani & Ni'matussyahara, 2024). The findings revealed that students in the experimental group, who were taught using the CORE model, showed significantly higher learning outcomes compared to their peers in the control group, who were taught using traditional methods. This highlights the importance of adopting innovative learning approaches, such as the CORE model, to enhance students' engagement and academic achievement (Alvarez-Bell & Bian, 2017).

One of the key strengths of the CORE model is its ability to actively involve students in the learning process (Cowan, & Harte, 2023). The model's four stages, Connecting, Organizing, Reflecting, and Extending, provide a structured yet flexible framework that encourages students to link new concepts with prior knowledge, organize their understanding systematically, reflect on what they have learned, and apply their knowledge to broader contexts (Sari, 2020). By engaging students in these activities, the CORE model promotes not only conceptual understanding but also the development of critical thinking and problem-solving skills (Pipitgool et al., 2021). This is particularly important in subjects like disaster mitigation, where students need to understand complex concepts and apply them to real-world scenarios.

The results of the study suggest that the CORE model is more effective than traditional teaching methods, which often rely on passive learning techniques such as lectures and rote memorization (Michel et al., 2009). The conventional approach, while useful for introducing basic concepts, tends to focus more on knowledge transmission than on fostering deeper understanding or critical thinking (De Leng et al., 2009). In contrast, the CORE model creates an interactive and dynamic learning environment that encourages students to become active participants in their learning process (Hannafin et al., 2013). This shift from a teacher-centered to a student-centered approach allows students to develop a more meaningful understanding of the subject matter and enhances their ability to apply their knowledge in real-life situations, such as disaster response and mitigation (Ghafar, 2023).

The study demonstrated that the CORE model had a positive impact on students' conceptual mastery (Ramdani et al, 2021) . In the context of disaster mitigation, this is crucial, as students must be able to grasp not only the theoretical aspects of disaster types and mitigation strategies but also the underlying causes and effects (Etkin, 2014). Traditional teaching methods often fail to provide the depth of understanding required to make these connections (Castronova, 2002). By using the CORE model, students are guided through a process that promotes deeper engagement with the material, enabling them to internalize key concepts and apply them

effectively in real-world situations (Alabi, 2024). This is particularly relevant for geography education, where understanding the interconnectedness of natural events and human actions is essential (Meadows, 2020).

While the results of this study are promising, it is important to recognize the limitations and potential areas for further research. The sample size used in the study was relatively small, with only two classes involved, and the research was conducted in a specific educational context. Future studies could expand the sample size and include a broader range of schools to test the generalizability of the findings. Additionally, integrating qualitative research methods, such as interviews or classroom observations, could provide deeper insights into how students experience the learning process and how they perceive the effectiveness of the CORE model. This would help identify potential barriers to successful implementation and inform future improvements in the model.

4. CONCLUSION

Based on the research results, it can be concluded that the implementation of the Connecting, Organizing, Reflecting, Extending (CORE) learning model has a significant effect on improving students' learning outcomes in geography, particularly in the topic of disaster mitigation at SMA 1 Driyorejo, Gresik Regency. The t-test results show that students who learned using the CORE model achieved higher learning outcomes compared to those taught using conventional learning methods.

The CORE learning model has proven to be effective because it actively engages students through four main stages: connecting (linking prior knowledge with new knowledge), organizing (systematically organizing ideas and information), reflecting (reviewing and evaluating understanding), and extending (developing and applying knowledge in broader contexts). Through this process, students become more active and reflective and gain a deeper understanding of disaster mitigation material.

The CORE learning model serves as an innovative alternative in geography education to enhance critical thinking skills, improve learning outcomes, and increase students' awareness of the importance of disaster mitigation.

REFERENCES

Alabi, M. (2024). Experiential learning: Fostering deep learning through active engagement. https://www.researchgate.net/publication/385684343_Experiential_Learning_Fostering_Deep_Learning_Through_Active_Engagement

Alvarez-Bell, R. M., Wirtz, D., & Bian, H. (2017). Identifying keys to success in innovative teaching: Student engagement and instructional practices as predictors of student learning in a course using a team-based learning approach. *Teaching and learning inquiry*, 5(2), 128-146.

Ansori, H., & Suryaningsih, Y. (2020). Pengaruh Model Pembelajaran Core Terhadap Hasil Belajar Siswa Dalam Menyelesaikan Soal Hots Pada Materi Aplikasi Turunan Fungsi Kelas Xi Mipa Sman 5 Banjarmasin. *Jurnal Pendidikan Matematika*, *2759*(1), 190–199. https://doi.org/10.20527/edumat.v8i19854

Aswina, A. (2019). Pengaruh Model Pembelajaran Core (Connecting , Organizing , Reflecting And Extending) Terhadap Hasil Belajar Siswa Kelas X. *Jurnal Kependidikan*, 43–55.

Badan Nasional Penanggulangan Bencana (BNPB). (2024). *Data dan Statistik Kejadian Bencana di Indonesia Tahun 2024: Analisis Sebaran dan Dampak Bencana per Wilayah*. Jakarta: BNPB.

Busman, D. Pertiwi, H. Adapun (2025). Pengaruh Model Pembelajaran CORE terhadap Kemampuan Penalaran Matematis Peserta Didik Kelas VII SMPN 33 Padang. *Jurnal Edukasi dan Penelitian Matematika*, 14(3), 64-69.

Calfee, R. C., & Patrick, C. L. (1995). T*eaching Reading Strategies: The CORE Model*. Palo Alto: Stanford University Press.

Castronova, J. A. (2002). Discovery learning for the 21st century: What is it and how does it compare to traditional learning in effectiveness in the 21st century. *Action research exchange*, 1(1), 1-12.

Cowan, J., & Harte, C. (2023). Towards a partnership model for developing core abilities. *International Journal for Students as Partners*, 7(1), 39-54.

Crismono. (2024). Pengaruh model pembelajaran connecting, organizing, reflecting, extending terhadap hasil belajar siswa pada pembelajaran matematika. *Jrnal Sigma, Volume 9,*.

De Leng, B. A., Dolmans, D. H., Jöbsis, R., Muijtjens, A. M., & van der Vleuten, C. P. (2009). Exploration of an e-learning model to foster critical thinking on basic science concepts during work placements. *Computers & Education*, 53(1), 1-13.

Etkin, D. (2014). Disaster theory: an interdisciplinary approach to concepts and causes. Butterworth-Heinemann.

Ghafar, Z. N. (2023). The Teacher-centered and the student-centered: a comparison of two approaches. *International Journal of Arts and Humanities*, 1(1), 18-23.

Hannafin, M., Land, S., & Oliver, K. (2013). Open learning environments: Foundations, methods, and models. *In Instructional-design theories and models* (pp. 115-140). Routledge.

Herfina. (2018). *Efektivitas Penggunaan Model Pembelajaran Connecting, Organizing, Reflecting, Extending (CORE) Pada Materi Aritmetika Sosial di Kelas VII Tahun Pelajaran 2016/2017 MTs Kebun Bunga Banjarmasin*. *20*, 1–16.

Meadows, M. E. (2020). Geography education for sustainable development. *Geography and Sustainability*, 1(1), 88-92.

Michel, N., Cater III, J. J., & Varela, O. (2009). Active versus passive teaching styles: An empirical study of student learning outcomes. *Human resource development quarterly*, 20(4), 397-418.

Muryani, C., & Ni'matussyahara, D. (2024). Strengthening student empathy in GeoCapabilities: Digital learning innovations and pedagogical strategies for disaster mitigation. **Contemporary Educational Technology**, 16(3), ep521.

Nugroho, D. A. (2019). Pengembangan perangkat pembelajaran geometri dengan mengadaptasi model CORE untuk meningkatkan efikasi diri Pengembangan perangkat pembelajaran geometri dengan mengadaptasi model CORE untuk meningkatkan efikasi diri. J*urnal Riset Pendidikan Matematika*. *6*(1), 39–52.

Nugroho, S. G. (2020). Pengaruh Model Pembelajaran CORE (Connecting, Organizing, Reflecting, Extending) terhadap Kemampuan Koneksi Matematis Siswa di SMP Negeri 206 Jakarta. *Jurnal Riset Pendidikan Matematika Jakarta*, 2(1).

Pipitgool, S., Pimdee, P., Tuntiwongwanich, S., & Narabin, A. (2021). Enhancing student computational thinking skills by use of a flipped-classroom learning model and critical thinking problem-solving activities: A conceptual framework. *Turkish Journal of Computer and Mathematics Education,* 12(14), 1352-1363.

Ramadhanaji, M., & Suyitno, S. (2024). Penerapan Model Pembelajaran CORE (Connecting, Organizing, Reflecting, Extending) Mata Pelajaran Dasar-Dasar Teknik Otomotif Berbantu Dengan Metode Mind Mapping dalam Upaya Peningkatan Hasil Belajar Peserta Didik. *Jurnal Ilmu Pendidikan dan Vokasi,* 1(4), 98-104.

Rosdiana, I., Sapriya, & Sopianingsih, P. (2024/2025). Pengaruh Model Pembelajaran CORE (Connecting, Organizing, Reflecting, Extending) terhadap Kemampuan Berpikir Kritis Peserta Didik dalam Pembelajaran Pendidikan Pancasila (Studi Kuasi Eksperimen di Kelas VII SMP Negeri 2 Cimahi Tahun Ajaran 2024/2025). *Jurnal Pengabdian Masyarakat dan Riset Pendidikan,* 4(1).

Sabrun, S. (2024). Upaya Meningkatkan Pemahaman Konsep Matematika Siswa Melalui Penerapan Model CORE di MA NW Putra Narmada Tahun Pelajaran 2023/2024. *Panthera: Jurnal Ilmiah Pendidikan Sains dan Terapan,* 4(3), 145-151.

Sari, E. P. (2020). CORE (Connecting, Organizing, Reflecting & Extending) learning model to improve the ability of mathematical connections. *In Journal of Physics: Conference Series (*Vol. 1581, No. 1, p. 012028). IOP Publishing.

Ramdani, A., Syukur, A., Permatasari, I., & Yustiqvar, M. (2021). Student Concepts' Mastery. *In 5th Asian education symposium 2020* (AES 2020) (pp. 195-199). Atlantis Press.

Toni Hardianto, A. A. Saputra, B. Kurniaaji & B. Darmawan. (2024). Pengaruh Model Pembelajaran CORE pada Materi Pelestarian Flora dan Fauna terhadap Hasil Belajar Siswa. DIAJAR: Jurnal Pendidikan dan Pembelajaran, 3(1), 108-115.

Trisnowali, A., & Aswina, A. (2023). Pengaruh Model Pembelajaran CORE (Connecting, Organizing, Reflecting and Extending) terhadap Hasil Belajar Siswa Kelas X. *Didaktika: Jurnal Kependidikan*, 13(1).

Umroh, N., & Indayati, T. (2024). Efektivitas Model Pembelajaran CORE (Connecting, Organizing, Reflecting, Extending) untuk Meningkatkan Hasil Belajar Peserta Didik pada Kelas VIII Materi Zat Aditif di MTs Negeri Gresik. *Kohesi: Jurnal Sains dan Teknologi,* 5(5), 21-30.

Utomo, E. S., & Rahman, F. (2022). Implementasi Model CORE (Connecting, Organizing, Reflecting, Extending) untuk Meningkatkan Aktivitas Siswa SMP Selama Pembelajaran Tatap Muka (PTM) Terbatas. J*urnal Cendekia: Jurnal Pendidikan Matematika,* 6(2).

Wicaksana, I. N. J., Wirya, N. D., & Margunayasa, I. G. (2014). Pengaruh Model Pembelajaran CORE (Connecting Organizing Reflecting Extending) Berbasis Koneksi Matematis Terhadap Hasil Belajar Matematika Siswa Kelas IV Sekolah Dasar. *MIMBAR PGSD Undiksha,* 2(1).

Zebua, N. B., Lahagu, A., Telaumbanua, W. A., & Laoli, B. (2024). Penerapan Model Pembelajaran Core dalam Meningkatkan Hasil Belajar Siswa Mata Pelajaran IPS Terpadu Kelas VIII SMP Negri 4 Gunungsitoli. *AKADEMIK: Jurnal Mahasiswa Humanis,* 4(3), 1103–1112. https://doi.org/10.37481/jmh.v4i3.1047.