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Application of Humanistic Theory Assisted by Deep Learning in Science Learning Grade 4 SDN 108/1 Sungai Rumbai

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Abstract

This study investigates the integration of humanistic learning theory with a deep learning approach in science education for fourth-grade students at SDN 108/1 Sungai Rumbai. We used a descriptive qualitative method and purposive sampling to select 14 students who actively participated in science learning. The research utilized validated instruments, including observation sheets, questionnaires, and student reflection notes, with a validity score ≥ 0.80 and reliability (Cronbach's Alpha) of 0.85. Data were analyzed thematically for qualitative aspects and using descriptive statistics and the Wilcoxon test for quantitative learning outcomes. Findings indicate significant improvements in student engagement, understanding of concepts, and emotional expression. Learning activities, supported by Canva and Wordwall, fostered interactive and joyful learning environments. Students demonstrated increased focus, confidence, and the ability to relate science material to personal experiences. Before the intervention, only 68% of students met learning targets, whereas after the implementation, 91.7% achieved satisfactory outcomes. Despite limitations in sample size and duration, the study emphasizes the promise of combining psychological theory and digital tools to improve science learning outcomes. This integration offers a promising model for 21st-century learning that is mindful, meaningful, and emotionally engaging.

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INTRODUCTION

Science learning in Elementary Schools should ideally be a fun, meaningful, and relevant experience for students' lives. Science is not just a subject about memorizing concepts and definitions but rather a means to foster curiosity, critical thinking skills, and scientific problem-solving skills from an early age. Science learning at the elementary level should involve active interaction between students and their surroundings, accustom students to observing natural phenomena, drawing conclusions from observations, and building connections between scientific concepts and real events that they experience every day. When learning materials are presented in an intriguing, contextual way and touch on students' personal experiences, their understanding of science will be deeper and more meaningful (Ni & Perni, 2018; Fahrunnisa & Fisa, 2024).

However, the field's reality reveals that traditional methods still dominate science learning in elementary schools. The learning model used is often teacher-centered, where the teacher is the only source of information and students only act as passive recipients. This kind of learning process is less able to stimulate students' curiosity and often makes them feel bored and unmotivated and not deeply understand the material being taught. This has a direct impact on low student learning outcomes and has not achieved the expected competencies (Muis, 2013; Syifa'a Rachmahana, 2008). A similar situation also occurred in class IV of SDN 108/1 Sungai Rumbai. Based on the results of initial observations, it was found that students' science learning outcomes were still relatively low, with an average score below the Minimum Completion Criteria (KKM) of 68. In addition, students seemed less enthusiastic about participating in science learning, were less brave in expressing their opinions, and tended to memorize without understanding the meaning of the material being studied. This phenomenon shows a gap between the ideal expectations of science learning and real conditions in the field.

To bridge this gap, innovation is needed in the learning approach that focuses on delivering material and pays attention to the emotional, social, and intellectual aspects of students. In this context, humanistic learning theory offers an approach that places students at the center of learning. According to Maslow (1975) in Suciati et al. (2024), the humanistic approach emphasizes the importance of creating an emotionally safe learning environment, providing freedom for students to express themselves, and supporting the development of their potential optimally. Humanistic views students as unique individuals who have the right to determine their learning paths. In this context, the teacher acts as a facilitator who accompanies, not dictates.

Furthermore, humanistic theory also emphasizes that the ultimate goal of the educational process is self-actualization, which is when students are able to develop their potential fully and meaningfully for themselves and others (Qodri, 2017). Research by Veronica Siregar & Dian Purnama Putri (2021) shows that the application of humanistic learning theory can increase students' self-confidence and make them more active in the learning process. However, the application of humanistic learning theory

should not stand alone without a concrete implementation strategy. This is where the deep learning approach becomes relevant to be integrated. In the context of education, deep learning is not just about artificial intelligence (AI) technology but more about a pedagogical approach that emphasizes a holistic, reflective, and contextual understanding of the subject matter (Fullan, 2014; Kovač et al., 2023). Deep learning encourages students to not only know the "what" of a concept but also "why" and "how" it is relevant and connected to real life.

Deep learning has three main characteristics in the context of education, namely: mindful (full awareness during the learning process), meaningful (personally and contextually meaningful), and joyful (enjoyable and inspiring learning). When students feel that what they are learning is related to real life and is delivered in a fun atmosphere, they will be more actively involved and understand the material more deeply. With today's technological advances, the deep learning approach can also be strengthened through the use of educational technology. One form is the use of digital applications such as Canva and Wordwall, which can make learning more interactive, visual, and in accordance with the learning styles of today's students. Technology helps provide adaptive feedback, personalize learning, and enrich students' learning experiences (Effendi & Wahidy, 2019). However, there are still many challenges faced in integrating humanistic and deep learning approaches in science learning in elementary schools. Many teachers are not yet accustomed to the role of facilitators who respect individual differences or have not been trained to use technology in the learning process optimally. In addition, there is no integrated learning model that explicitly combines humanistic values and technology-based deep learning approaches in elementary schools.

To answer these challenges, this study offers the application of the IPAS (Identify, Plan, Act, Share) learning model combined with humanistic principles and a deep learning approach. The IPAS model provides a systematic yet flexible framework for learning steps, starting from identifying problems or learning needs, planning solutions, and implementing learning actions to sharing learning outcomes. In its implementation, IPAS is integrated with technology-based media such as Canva and Wordwall to enrich the learning process visually and interactively. This approach is designed to create a more individual, contextual, enjoyable, and meaningful learning atmosphere, according to the needs and characteristics of grade IV elementary school students. With this approach, students are encouraged to be actively involved in the learning process, build a profound understanding of science concepts, and develop a positive attitude towards science learning. In addition, teachers are also encouraged to be more reflective, creative, and innovative in delivering materials so that harmonious and productive learning interactions are created.

The results of implementing this model are expected to not only improve students' learning outcomes cognitively but also strengthen their emotional and social involvement in the learning process. Students not only understand the concept better,

but also feel appreciated and motivated and enjoy the learning process. Teachers also gain new experiences in managing learning that integrates modern educational theory with the use of relevant technology.

In general, this study aims to examine how the implementation of science learning that combines the principles of humanistic learning theory and deep learning approaches through the Canva and Wordwall-based science models can improve concept mastery and learning outcomes and create deeper and more meaningful learning experiences for grade IV students of SDN 108/1 Sungai Rumbai. In addition, this study is also expected to contribute to the development of educational practices in elementary schools, both for teachers, students, schools, and education policy makers.

METHOD

A descriptive qualitative approach was used in this study to gain an in-depth understanding of the implementation of the application of humanistic learning theory with the help of deep learning. The research participants were 14 fourth-grade students of SDN 108/1 Sungai Rumbai selected using purposive sampling based on the criteria of active participation in science learning.

This study was conducted on 14 fourth-grade students of SDN 108/1 Sungai Rumbai. The questionnaire instrument has gone through expert validation and initial trials with a validity value of ≥ 0.80 and Cronbach's Alpha reliability of 0.85. Qualitative data analysis used thematic coding techniques, while quantitative data on learning outcomes were analyzed using descriptive statistics and the Wilcoxon test to see significant differences before and after the intervention. Triangulation was carried out between observation data, questionnaires, and reflections to increase the validity of the findings. Quantitative data in the form of student learning outcomes were analyzed using descriptive statistics and the Wilcoxon test to test the significance of improvements in learning outcomes before and after the intervention. Qualitative data analysis used thematic coding techniques to identify key themes related to student experiences and engagement in learning.

Triangulation of methods was carried out by combining observation data, questionnaires, and student reflections to increase the validity of the findings. The research data were analyzed from the beginning of data collection until a certain time limit afterwards. Consequently, we employed the triangulation method, a data collection approach that seamlessly integrates various techniques and sources. This method checks the accuracy of the data by using various techniques and sources to ensure its validity. For this reason, researchers used observation, questionnaires, and student reflection notes during learning as research methods.

Observation: the Observation method aims to observe the interaction between teachers and students during the learning process, see how the classroom atmosphere is and the implementation of learning activities through the application of humanistic This study directly applies a learning theory that incorporates a deep learning approach during science instruction for grade IV students.

This study is also equipped with a questionnaire in the form of questions related to the material as a measuring tool for student understanding of learning. Students, consciously and without coercion, can express their thoughts, feelings, difficulties, and understanding during the learning process through reflection notes to obtain accurate data. From the data obtained, it is expected to be able to provide a specific picture of how the implementation of the application of humanistic learning theory with the help of deep learning in learning science for grade IV students at SDN 108/1 Sungai Rumbai.

RESULTS AND DISCUSSION

In the initial planning stage, the researcher developed a lesson plan or science teaching module with the theme 'Me and My Needs.' This resource combines humanistic learning syntax and applies a deep learning pedagogical approach. The researcher also prepared observation tools and questionnaires and planned reflections at the end of the learning. After all preparations are complete, the next step is the implementation stage. In this phase, the researcher carries out activities according to what has been previously planned and carries out all the necessary processes.

During the learning process, researchers observed and practiced learning directly related to the behavior that emerged, how active students were individually and in groups, students' enthusiasm for learning, and positive attitudes between teachers and fellow students in the class during the learning process. This is very different from previous learning practices before the application of humanistic learning theory and deep learning in science learning in Class IV SDN 108 Rumbai, students were less focused, not actively asking questions in group discussions. Researchers have succeeded in creating a conducive, safe, and comfortable learning environment, accompanied by full attention during the activity. The presentation of relevant materials also helps to increase students' confidence in asking questions. This concept is in line with the views of Fullan (2014, 2018), which emphasize the importance of a mindful, meaningful, and joyful learning environment to trigger student engagement, increase motivation, and create learning pleasure that fosters curiosity and enthusiasm. Deep learning, both pedagogically and technologically, has been implemented simply. The Canva application, which is used for creating infographics, and Wordwall, an interactive quiz platform that provides direct feedback to students, are both examples of deep learning applications. It is an application of deep learning that refers to technology. Although this technology is not yet fully based on artificial intelligence (AI) with deep learning capabilities, the application supports the principles of humanistic learning by providing space for students to be creative and learn independently. This approach leads to increased student motivation and involvement, which then encourages their activeness in learning. This This condition automatically triggers the emergence of fresher and more creative learning methods during the learning process (Effendi & Wahidy, 2019). The approach aligns with the principles of 21st-century learning.

The Wilcoxon test results showed a significant difference in student learning achievement between before and after the implementation of the humanistic theory-based learning method supported by deep learning. A significant increase in the average value of learning outcomes indicates that the learning intervention implemented was effective in improving students' understanding of the science and science material. Descriptive statistics also illustrated an increase in scores in almost all participants, strengthening the finding that this approach was effective in the context of learning in grade IV of SDN 108/1. Data obtained from the results of observations and questionnaires show that the activities and learning outcomes in the science and science material have increased, as presented in table 1.

Table 1. Learning Outcome Values After the Application of Humanistic Theory Assisted by Deep Learning

Group	Mark	Number of Students	Percentage
A	85–100	6	50 %
B	70–84	5	41,7, %
C	< 70	1	8,3
	Amount	12	100%

The results of the study showed enthusiasm for learning and encouraged active involvement by students in line with the principles of humanistic theory and deep learning. A total of 6 students scored around 85–100 with a percentage weight of 50%; as many as 5 people scored between 70 and 84 with a percentage weight of 41.7%; and only one student scored below 70 with a percentage weight of 8.3%. From this study, researchers saw an increase in student learning outcomes, reaching 91.7% from the previous 68%. The results of observations during learning activities show significant changes after applying humanistic learning theory and deep learning in class: students appear focused and confident while learning, actively discuss and ask questions, and participate in learning activities with enthusiasm and happiness. The application of humanistic learning theory can foster students' internal motivation (Fahrunnisa & Fisa, 2024). Additionally, there are positive changes observed in students, class dynamics, and the presence of activities (Al Ghozali & Fatmawati, 2021). The humanistic approach to learning focuses more on the human aspects of students. This theory does not rush in demanding understanding but emphasizes the material studied to form a complete individual. (Insani et al., 2019).

To facilitate understanding of the changes, key points of the learning observation results have been summarized. This data was collected in two stages: before and after the implementation of the integrated learning approach.

Table 2. Comparison Table of Student Learning Achievements Before and After Integration of Humanistic Theory and Deep Learning.

Observation Aspect	Before Implementation	After Implementation	Increase/ Decrease	Notes
Student Engagement in Discussion	41	83	+42%	Students are more active in participating in class discussions.
Concept Understanding Level (Average Formative Test Score)	50	83	+33	Average student test scores increased, indicating better understanding.
Expression of Positive Emotions during Learning (Scale 1-5)	25	42	+1.7	Students more often show joy, enthusiasm, and curiosity when learning.
Ability to Relate Material to Personal Experience	33.3	83.7	+50.4%	More students are able to relate science material to their everyday experiences and knowledge.
Focus and Attention during Learning (Average Minutes)	15	30	+15 minutes	The average time students spent focusing and paying attention to assignments and teacher explanations increased.

Table 2 above indicates an increase in the quality of integrating humanistic learning theory with the principles of deep learning as a philosophy (mindful, meaningful, and joyful) and deep learning as a technology in science learning in class 4 of SDN 108/I Sungai Rumbai. A significant increase in student engagement in discussions indicates that a student-centered approach that provides space for self-expression (humanistic elements) and connects material to real experiences (meaningful deep learning) successfully stimulates their active participation. The increase in the average score of the formative test indicates that learning that emphasizes deep understanding and personal relevance (meaningful deep learning) and a positive learning atmosphere (joyful deep learning) contributes to better mastery of science concepts. (Khotimah & Abdan, 2025). When students feel comfortable and

motivated, they tend to be more open to the learning process. More details are explained in data on students' positive emotional expressions during learning.

Table 3. Before Implementation.

Emotional Level (Scale 1-5)	Student Frequency	Percentage (%)
1	2	16.7
2	4	33.3
3	6	50.0
4	0	0.0
5	0	0.0
Total	12	100

Table 4. After Implementation

Emotional Level (Scale 1-5)	Student Frequency	Percentage (%)
1	0	0.0
2	0	0.0
3	4	33.3
4	6	50.0
5	2	16.7
Total	12	100.

The general interpretation of this rating scale is as follows: Scale 1 indicates that students very rarely show expressions of happiness in learning. On scale 2, students sometimes show joy in learning. Scale 3 means that students show joy on several occasions. Scale 4 indicates that students often show joy. Meanwhile, scale 5 means that students consistently and clearly show joy in their learning process. The data shows an increase in emotions during learning which is the impact of the application of humanistic and deep learning theories, all students responded positively to learning with joy.

The increase in students' ability to relate material to personal experiences shows that the principle of meaningful deep learning has been successfully implemented. The application of contextual learning becomes more meaningful and easy to remember if accompanied by humanistic attitudes towards students, both verbally and in action, supported again by pedagogical and technological deep learning. Students' attention and focus are longer during learning; this indicates that approaches that encourage awareness and active involvement (mindful deep learning and humanistic elements) help students to stay connected with the subject matter. This study shows that the integration of humanistic theory with deep learning is very likely to improve the quality and effectiveness of the science learning process in grade IV of SDN 108/1 Sungai Rumbai. This method is effective in improving not only the cognitive aspects of students but also fostering their emotional connections and personal relationships with the lesson content.

The results of this study indicate that the application of humanistic learning theory combined with a pedagogical approach and deep learning technology has a significant impact on increasing student engagement, conceptual understanding, and positive emotional expression in science learning. This finding reinforces Carl Rogers' (1969) view that education that places students at the center of learning, with teachers acting as empathetic and authentic facilitators, can create a conducive and meaningful learning environment. Success in building a comfortable and safe learning atmosphere allows students to express themselves more freely, actively ask questions, and engage in group discussions more intensively.

Furthermore, there was an increase in class discussion participation, a deeper understanding of concepts, and improved student abilities in certain subjects related to their personal experiences. This kind of learning is in line with what Khotimah and Abdan (2025) call meaningful learning strategies for the 21st century, which emphasize the relevance of subject matter to students' real-life contexts. The use of simple technologies such as Canva and Wordwall also makes an important contribution to creating an interactive and creative learning atmosphere. Although not yet fully based on artificial intelligence (AI-based deep learning), this technology still supports the essence of student-centered learning. These results support the opinion of Effendi and Wahidy (2019), who stated that the use of digital media in learning can increase motivation and learning appeal, as well as facilitate instant feedback that is much needed in the active learning process. Significant changes were also seen in the emotional aspects of students during the learning process (Amini, dkk, 2024). If before the intervention most students showed neutral or even negative emotional expressions, then after implementing this approach, most students appeared more enthusiastic and excited and showed higher emotional involvement. This is in accordance with the findings of Fahrunnisa and Fisa (2024) that the humanistic approach not only pays attention to the cognitive aspects of students but is also very effective in building healthy emotional relationships between students and the subject matter.

In terms of class dynamics, positive changes were also seen in the increase in student focus during the activity. The duration of attention almost doubled, indicating that the mindful learning approach combined with humanistic principles is able to continuously maintain student engagement. This conclusion is reinforced by the findings of Sulistyowati and Wulandari (2020), who stated that enjoyable learning and building a sense of ownership of the subject matter will increase students' focus and learning endurance. Although the results of this study are very promising, there are some limitations that need to be considered. The small sample size and relatively short duration of the study are major obstacles in generalizing the findings. In addition, the limitations of the technology used indicate enormous potential for the development of more adaptive and personalized AI-based learning, as recommended by Luckin et al. (2016) in the concept of intelligent tutoring systems.

Finally, the reflection results highlight the application of humanistic learning theory and deep learning. Through humanistic theory, the teacher acts as a facilitator of in-depth discussions, encouraging students to participate actively and without shame. The evaluation indicates that the combination of humanistic theory and deep learning successfully boosted learning achievement and developed positive attitudes toward the science material. The students' own reflections reviewed their understanding of the material, participation in learning, and emotional experiences during the activity, clearly showing a shift in attitudes towards a more positive direction after learning. This study certainly has some limitations. The main drawbacks are the relatively small sample size and short duration of the intervention, so the results obtained cannot be generalized widely. In addition, the limitations of the AI technology used in this study indicate great potential for further development in order to optimize personalization and adaptation of learning.

CONCLUSION

The application of humanistic learning theory, combined with deep learning in science learning provides a positive contribution to the learning process. The humanistic approach, which focuses on the needs, interests, and experiences of students and treats teachers as facilitators who always appreciate and care, can be further enhanced with deep learning capabilities applied pedagogically and technologically so that adaptive learning is personally effective thanks to the support of all elements. This small-scale study shows that the combination of these two methods is effective in strengthening motivation, deepening conceptual understanding, and substantially increasing student active engagement. In addition, the use of deep learning supports teachers in adjusting learning methods according to student characteristics so that the learning process is more effective and meaningful. These findings open up opportunities for the development of innovative learning models that combine psychological aspects and intelligent technology to realize more humanistic and data-based science and science learning.

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