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Applying a Deep Learning Pedagogical Model in Physical Education and Health Learning

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Abstract. This study examines the implementation of the Deep Learning model in Physical Education, Sports, and Health (PJOK) learning at YSKI Christian High School, Semarang. Deep learning emphasizes meaningful, reflective, and contextual learning experiences that foster students' higher-order thinking and real-life application of physical activity. A descriptive qualitative approach was employed involving PJOK teachers and Grade XI students. Data were collected through interviews, observations, documentation, and student questionnaires and analyzed using triangulation of sources, methods, and time.The findings indicate that the Deep Learning model is implemented through three core principles: Meaningful Learning, Mindful Learning, and Joyful Learning. These principles enhance students' cognitive engagement, understanding of learning purposes, and ability to apply physical activities in daily life. Institutional support, technological readiness of teachers and students, and a supportive learning environment emerged as key facilitating factors. However, limited instructional time and variations in students' digital literacy remain challenges. The use of digital platforms such as Kahoot, Quizizz, and SiSKY significantly increases learning interactivity and motivation. Overall, the Deep Learning model contributes positively to improving PJOK instructional quality and students' critical, collaborative, and reflective skills**.**

Keywords: Deep Learning; Physical Education; educational technology; meaningful learning; qualitative.

INTRODUCTION

Education is one of the most important things in the progress of a nation. (UNESCO, 2017) states that fundamental change lies in how we consider the role of education in global development, because it has a catalytic effect on the future of individuals and our world. Therefore, education can contribute to a new vision of global development. In Indonesia, the role of education is constitutionally regulated in the 1945 Constitution, Article 31 paragraph 1, which states that every citizen has the right to education, and is reaffirmed in the Ministry of National Education, 2003 Number 20 of 2003 concerning the National Education System. The goal of national education is for Indonesian people to become religious and moral people, able to master knowledge and skills, physically and spiritually healthy, have good personalities, and be responsible (Setiyorini & Setiawan, 2023). This shows that education is a strategic instrument in realizing the ideals of enlightening the life of the nation. This can be interpreted that education not only improves the quality of human resources of a nation but also improves the quality of human resources globally.

The current Indonesian education system is governed by curriculum policy. The curriculum is crucial for the implementation of educational activities because it determines the direction, content, and methods of education delivery. This ultimately determines the type and level of ability of graduates from an educational institution (Marzuqi & Ahid, 2023). The curriculum is developed and implemented nationally for all schools in an effort to realize the ideals of the Indonesian nation. Each curriculum must contain desired educational objectives, namely the learning outcomes expected of students. Teachers play a crucial role in supporting students' growth and achieving their life goals to the fullest (Marsela Yulianti et al., 2022). The curriculum plays a crucial role in education, as it is linked to educational standards in Indonesia, which ultimately determine the quality of graduates from an educational institution. With the changing times and societal needs, the educational sector needs to innovate in the learning process. Innovation in education will thrive and achieve its goals if the educational program is designed and implemented in accordance with current conditions and demands (Fatmawati, 2021).

Independent Curriculum or Independent Learning is a new policy program from the Ministry of Education and Culture of the Republic of Indonesia. (KEMENDIKBUD

RI) launched by the Minister of Education and Culture of the Republic of Indonesia in the Advanced Indonesia Cabinet. The independent curriculum is considered more flexible than the previous curriculum. This means that teachers, students, and schools have more freedom in implementing learning activities in schools (Lestari et al., 2023). The shift from the 2013 Curriculum to the Independent Curriculum marks the government's effort to create a more flexible, contextual, and student-centered learning system. The Independent Curriculum provides room for teachers to innovate through the implementation of various learning models, such asproblem-based learning, flipped learning, cooperative learning,And game-based learning which aims to develop students' full potential. However, in an increasingly complex educational context, a learning approach is needed that is not only oriented toward results, but also focuses on deep, reflective, and meaningful thinking processes.

In the current Independent Curriculum, there are learning methods that teachers can use to approach learning for students, one of which is deep learning. Deep Learning train students' independence and collaborative skills.Deep learning emphasizes increasing student self-confidence through group discussions, experiments, or project implementation. In addition, students have the opportunity to reflect on their learning. This way, students will become aware of their weaknesses in the learning process. It is hoped that through reflection, students will be able to improve their abilities so that learning outcomes can be realized as desired (Adnyana, 2024). Deep learning-based learning models focus on developing a deeper understanding of the subject matter through comprehensive learning experiences, where students become more emotionally and cognitively engaged in their learning process (Suwandi et al., 2024). Innovation in the application of deep learning must also be strengthened to improve the quality of the learning process and outcomes (Raup et al., 2022). Deep learningis a learning method that provides students with experience. Students are not burdened with theoretical aspects, but rather with a hands-on approach. Deep learning focus on contextual knowledge (Fitriani & Santiani, 2025). Deep learning covers three aspects, namely meaningful learning, mindful learning, And joyful learning.

These three concepts are integrated with each other to provide a more in-depth, relevant, and motivating learning experience. Meaningful Learning Students can connect new knowledge with knowledge or experience they already have. Meaningful Learning

has similarities with the constructivist approach (Adnyana, 2024). In Mindful Learning students not only prioritize results, but also pay attention to their learning process. Active participation of students in learning is expected to strengthen their curiosity (Purwanto et al., 2025). Learning through Joyful Learning Creating a supportive atmosphere, making the learning process interactive, exploratory, and collaborative. Students enthusiastically participate in the learning process. The learning process is made engaging and tailored to the students' learning methods (Purwanto et al., 2025).

Physical Education (PJOK) is a crucial component of the education system, aiming to improve students' physical fitness, motor skills, mental health, and social values through various physical activities (Faisal et al., 2024). As a subject that focuses on physical and character development, PJOK offers significant potential for incorporating a deep learning approach into the learning process (Angga & Sari, 2025). Physical Education, Sports, and Health (PJOK) plays a crucial role in shaping character and improving students' physical skills, particularly at the senior secondary level. To improve the quality of PJOK learning at YSKI Christian High School in Semarang City, one important consideration is the implementation of a deep learning approach. One method considered effective in achieving this goal is the deep learning approach. Deep Learning.

Implementation of learning models Deep Learning At the high school level, this is an innovation in education that aims to improve students' critical, reflective, and in-depth thinking skills. In schools that have implemented this approach, supported by adequate technology, the learning process should be more interactive and meaningful. Therefore, the importance of effective learning to achieve increasingly complex goals requires exploration of how this approach can be implemented. Deep Learningcan be implemented effectively in PJOK learning at YSKI Christian High School. The reason for choosing YSKI Christian High School as the object of research is because this school has begun to implement the approach. Deep Learning, particularly in the subject of Physical Education, which reflects the school's commitment to improving the quality of education. YSKI Christian High School has a good quality of education, as evidenced by its outstanding academic and non-academic achievements. This study explores in depth how Deep Learning modelsused in Physical Education and Health learning at YSKI Christian High School. This study also evaluates the model's effectiveness in helping students understand the material, analyzes the challenges faced by teachers, and provides

suggestions for improving and developing the learning model to make it more appropriate and flexible.

From observations and interviews, researchers identified several issues, one of which was low student interest in theoretical learning. This was evident in the low student participation and enthusiasm during the classroom learning process, particularly when the material was taught conceptually without direct relevance to real-life applications. This low student interest in theoretical learning in class stems from the lack of engaging learning materials, which quickly leads to boredom (Falata et al., 2024).

Students are typically more enthusiastic about learning when participating in field activities. When they are directly involved with real-world objects or situations, they feel more challenged and engaged. This suggests that even though the method is being used, the teacher's delivery of theoretical material is still inadequate in connecting concepts to real-world situations that are relevant to students. As a result, the learning objective of understanding the material in depth and meaningfully is not being achieved.

This study examines in depth how the model deep learning used in Physical Education (PJOK) learning at YSKI Christian High School. This study also evaluates how effective the model is in helping students understand the material, analyzes the difficulties faced by teachers, and provides suggestions for improving and developing the learning model to make it more appropriate and flexible. Based on this background, the researcher is interested in conducting a study entitled "Implementation of the Learning Model Deep Learning in the Physical Education, Sports and Health Subject at YSKI Christian High School".

METHOD

The type of research used in this study is descriptive qualitative research. Descriptive qualitative research describes an object, phenomenon, or social situation presented in narrative form. In writing, the data and facts collected are presented in the form of words or images, not numbers. Qualitative research reports contain quotations from data (facts) obtained directly in the field, serving as supporting information for the report's content (Sugiyono, 2017).

Researchers apply three approaches in data collection techniques, namely: interviews, observation and documentation and use relevant data collection instruments

such as Observation Guidelines, Interview Guidelines and documentation that have been validated by relevant experts in their fields before being tested. After obtaining the data, they use the Triangulation Technique of Source, Method and Time and continue with data analysis techniques, namely data reduction, data presentation and drawing conclusions based on theory (Huberman & Miles, 1992).

RESULT AND DISCUSSION

RESULT

Strategies in Implementing Learning ModelsDeep LearningPhysical Education Learning.

Based on the results of research at YSKI Christian High School, the learning model deep learning implemented as part of a learning innovation in accordance with the Ministry of Primary and Secondary Education policy. This policy emphasizes the importance of enhancing higher-order thinking skills through a deep learning approach.

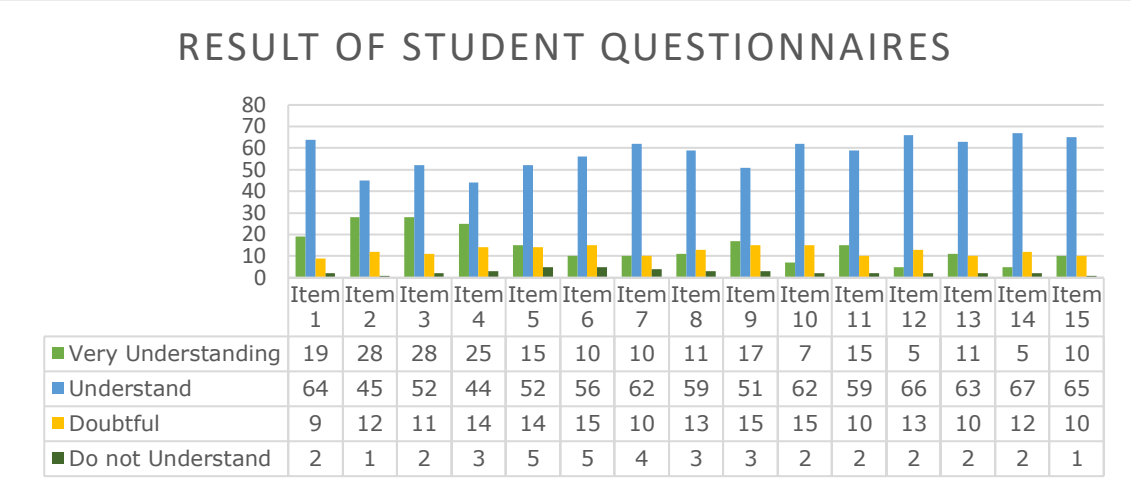
The results of observations and interviews with PJOK teachers at YSKI Christian High School show that the implementation of deep learning carried out with three main concepts, namely Mindful, Meaningful, And Joyful. This approach encourages students not only to imitate sports movements but also to understand the meaning, benefits, and purpose of each activity. The teacher acts as a facilitator, helping students explore ideas, think critically, and reflect on the learning outcomes they have achieved.

Physical Education (PJOK) teachers at YSKI Christian High School use this method by implementing collaborative learning strategies. Students are divided into small groups to discuss, analyze, and convey reflections on the material being studied. During the learning process, teachers act not only as instructors but also as facilitators, guiding students in critical thinking and problem-solving. Assessments are conducted authentically and comprehensively. Evaluations assess not only students' physical skills but also encompass thinking skills, teamwork, and sportsmanship.

Supporting Factors and Barriers to the ApproachDeep Learning In Physical Education Learning.

Research shows that success in implementing deep learningat YSKI Christian High School is supported by several factors, namely: 1. The existence of training for teachers and technological support such as Kahoot, Quizizz,and website SiSKYas a

digital learning tool. 2. A comfortable learning environment and a good relationship between teachers and students. 3. Students are ready and open to the use of technology and innovation in learning.



	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Item 15
Very Understanding	19	28	28	25	15	10	10	11	17	7	15	5	11	5	10
Understand	64	45	52	44	52	56	62	59	51	62	59	66	63	67	65
Doubtful	9	12	11	14	14	15	10	13	15	15	10	13	10	12	10
Do not Understand	2	1	2	3	5	5	4	3	3	2	2	2	2	2	1

Diagram 1. Student Questionnaire Results.

The results of the student questionnaire regarding the application of the Deep Learning learning model in PJOK subjects show that many supporting factors play a role in its successful implementation. Student questionnaires show that students are very interested in learning activities that require deep understanding, exploration and problem solving. The Deep Learning approach is considered to be able to increase student motivation and increase active involvement in learning. Certain students are unable to adapt quickly to learning patterns that demand independence and in-depth analysis. In PJOK activities, some students experience difficulties when asked to connect ideas, reflect, or make decisions critically. Inhibiting factors include limited learning time, differences in students' abilities in using technology, and there are still teachers who have not fully mastered the implementation Deep learning.

Utilization of Technology in Physical Education Learning.

The use of technology in PJOK learning at YSKI Christian High School is very important for implementing the approach deep learning. The school uses the SiSKY platform as its primary tool to support digital learning. Physical education (PJOK) teachers utilize instructional videos, illustrative images, and interactive apps to help students understand material on health, physical fitness, and sports strategies.

Survey results show that the majority of students find technology-based learning media beneficial. They find the learning process more engaging and easier to understand because the material is presented visually and interactively. However, several challenges remain, such as limited study time and a lack of variety in the use of digital media. Some students also admitted to being less engaged with theoretical material if it isn't accompanied by engaging media.

DISCUSSION

Strategies in Implementing Learning ModelsDeep LearningPhysical Education Learning.

Implementation of learning models deep learning. The introduction of physical education (PJOK) at YSKI Christian High School is an innovative step aimed at improving the quality of the teaching and learning process. This aligns with the Ministry of Primary and Secondary Education's policy, which emphasizes the importance of developing higher-order thinking skills. This approach not only helps students understand concepts but also encourages them to connect, reflect, and apply knowledge to real-life situations.

The results of the study show that the PJOK teachers at YSKI Christian High School have tried to integrate three main concepts. Deep learning, that is Meaningful Learning, Mindful Learning, And Joyful Learning, in learning activities. Meaningful Learning emphasize the importance of understanding the meaning behind sports activities, not just imitating movements. Mindful Learning paying attention to awareness and reflection on each learning experience, while Joyful Learning ensure the learning process is fun, not stressful, and provides space for creativity.

In practice, this strategy is implemented through various activities that combine theory and hands-on practice. For example, in physical education lessons, students not only warm up but also explain the purpose of each movement and its impact on the body. This approach allows physical education lessons to focus not only on physical mastery but also on developing the overall thinking, feeling, and acting aspects.

These findings support the opinion (Diputera et al., 2024) that immersive learning can help students develop critical, reflective, and creative thinking skills. By engaging

students in discussions, self-reflection, and problem-solving, teachers not only provide subject matter but also create ongoing and sustainable learning experiences.

However, the research also identified several challenges in implementing this strategy. One issue identified was limited learning time. Because physical education (PJOK) subjects have limited class time, and most of the time is spent on hands-on practice, teachers struggle to provide sufficient time for reflection, in depth discussions, and problem-based projects. Therefore, the implementation of this learning strategy requires. Deep Learning cannot be done optimally in all classes. In addition, teacher readiness and ability are also important factors in the successful implementation of the learning model Deep Learning.

Thus, the research results show that the learning implementation strategy Deep Learning YSKI Christian High School has great potential to improve the quality of physical education (PJOK) instruction. However, for this approach to be effective, adequate support from the school is needed in the form of better time management, teacher capacity building, and the provision of learning resources that align with the characteristics of in-depth learning.

Supporting Factors and Barriers to the ApproachDeep Learning In Physical Education Learning.

Implementation of the model deep learning It depends on various factors that can support or hinder it, both within and outside the school. According to research, factors that facilitate the implementation of deep learning at YSKI Christian High School include: a school that is ready to use technology, a comfortable and supportive learning environment, and students who are ready and interested in innovative learning methods.

YSKI Christian High School has implemented digitalization in the teaching and learning process by using several applications such as Kahoot, Quizizz, and platforms SiSKY. A learning website created by the school itself. This application serves as an interactive learning tool, making the learning process more engaging. Teachers use various digital platforms to provide quizzes, interactive exercises, and game-based group projects.

This research aligns with research by (Miasari et al., 2022), which states that the use of technology in the learning process can improve the quality of learning, make it more time-efficient, and provide a more engaging experience for today's students. YSKI

Christian High School students, who are part of Generation Z, tend to respond more readily to learning methods that utilize digital interactions and visual content.

A comfortable learning environment and a good relationship between teacher and students are also important factors in supporting the learning process. Teachers who act as facilitators are able to create an open, collaborative, and enjoyable classroom atmosphere. This reflects the principles of Joyful Learning which is included in the deep learning approach. However, from the results of the questionnaire conducted, it appears that There are several obstacles to consider. Some students don't fully understand the differences between deep learning and conventional learning methods. They can recognize general terms and the objectives of deep learning, but they can't yet apply them to everyday learning activities.

Furthermore, limited time and differences in technology skills among students present challenges. Some students with better access and technological skills adapt more easily to digital learning, while others with less familiarity struggle. Teachers also struggle to design truly comprehensive learning activities that utilize technology, not just as a presentation tool.

These obstacles demonstrate that implementing immersive learning requires a comprehensive approach and commitment from all parties: teachers, students, and educational institutions. Schools must provide ongoing training to enable teachers to design effective digital learning.

Utilization of Technology in Physical Education Learning.

Research results show that the use of technology is very important to support the success of implementation.deep learningat YSKI Christian High School. The school has integrated technology in a planned manner into the teaching and learning process, both in delivering material and in providing assessments. Physical education teachers use various digital media, such as videos, animations, and infographics, to explain physical fitness concepts, body structure, and exercise strategies. The SiSKY platform, an online learning platform, allows students to access materials, complete assignments, and take exams independently outside of school hours. This makes the learning process more flexible and encourages student independence.

Surveys show that most students benefit from using technology when learning. They find it easier to understand material when presented in a visual and interactive format. Learning becomes more engaging and less boring, especially for students who prefer learning through images or movement. However, the survey results also revealed several issues, such as limited study time, insufficient digital media diversity, and differences in student motivation. Some students found physical education theory boring when presented solely in text format without engaging images or visuals. Therefore Teachers should use various types of media such as text, sound, video, and simulation simultaneously to make learning more effective. This discussion is in accordance with research (Mariyah & Firdaus, 2024). This demonstrates that technology is not just a visual aid, but also a way to enhance students' learning experiences by combining thinking, feeling, and action. By implementing Project-Based Learning and Problem-Based Learning methods, teachers can engage students in various activities, such as creating exercise programs, making sports videos, or conducting simple research on physical health.

Technology also helps teachers conduct more accurate assessments. Using digital platforms, teachers can monitor students' learning progress, collect their assignments, and provide immediate feedback. Assessments focus not only on physical abilities but also include aspects of reflection, conceptual understanding, and critical thinking skills in each sporting activity. Therefore, the use of technology in PJOK learning not only makes teaching methods more modern, but also changes the way students learn to be more active and reflective.

CONCLUSION

The application of the Deep Learning learning model in the PJOK subject at YSKI Semarang Christian High School has been proven to be able to support the achievement of learning objectives through developing students' critical, reflective and collaborative thinking abilities. The integration of three key principles Meaningful, Mindful, and Joyful Learning encourages deeper learning engagement and allows students to connect learning experiences to real-life contexts. The effectiveness of this model is strengthened by technological support and a conducive learning environment, although there are still obstacles such as limited time and variations in students' digital abilities. Overall, this research shows that the Deep Learning approach is a relevant and potential strategy in

improving the quality of PJOK learning and encouraging the achievement of the competencies expected in the Independent Curriculum.

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