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THE RELATIONSHIP BETWEEN DEEP LEARNING-ORIENTED TEACHING AND HOTS THROUGH LEARNING ENGAGEMENT IN ECONOMIC LEARNING

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ABSTRACT

The purpose of this study is to examine the relationship between students' HOTS and Deep Learning-Oriented Teaching, both directly and through the mediating function of learning engagement at the senior high school level. A sample of 163 students was chosen via proportional stratified random sampling for this exploratory quantitative investigation. An online survey was used to collect the data, which were then subjected to PLS-SEM analysis using Warp-PLS 8.0 software. The findings show that Deep Learning-Oriented Teaching has a positive and significant relationship with Learning Engagement, while its direct effect on HOTS is not significant. Learning Engagement is proven to have a positive and significant relationship with HOTS and fully mediates the relationship between DLOT and HOTS. It emphasizes how crucial learning engagement is as a psychopedagogical strategy that helps students internalize economic learning objectives. In order to make deep learning effective, schools and economics teachers are crucial in assessing and conducting economics lessons with activities rich in epistemic inquiry and evidence-based decision-making. The degree of learning engagement must also be taken into account when assessing the effectiveness of deep learning in the curriculum.

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INTRODUCTION

The transformation of education in the global era has emphasized the need to strengthen Higher Order Thinking Skills (HOTS) as the main competency standard for students (Liu et al., 2024; Norbi et al., 2026). HOTS forms an important foundation for preparing students to face the increasingly dynamic complexity of economic, social, and technological issues (Zhang et al., 2024). However, various international assessments indicate that Indonesian students' higher-order thinking skills are still lacking. The results of the 2022 Program for International Student Assessment (PISA) show that Indonesian students' literacy, numeracy, and problem-solving skills are still below the average for OECD member countries (OECD, 2022). This shows that the learning process has not been able to develop analytical skills, which are the main indicators of HOTS according to Bloom's Taxonomy revised by Anderson and Krathwohl (Krathwohl, 2002).

Low HOTS among students has also been reported in various empirical studies in Indonesia. Research by Geshere et al., (2026) shows that most students still struggle with analytical-based questions because assessments are still dominated by lower-order thinking tasks. The implementation of learning in schools is still dominated by surface-level learning that does not encourage deep cognitive engagement, thus providing little room for developing critical thinking skills. In economics learning, the tendency to use teaching methods that focus on knowledge transfer means students receive more information than building conceptual understanding. As a result, students are not well-trained in connecting economic concepts to real-world problems (Beker, 2025; Birdi et al., 2026; Zhang & Ramse, 2021).

The phenomenon of low HOTS skills among students was also found at SMA Negeri 4 Surabaya. Interviews with the school's economics teacher revealed that students' HOTS skills were still low, especially in grades 10 and 11, as evidenced by 70% of students' difficulties in analyzing and evaluating economic problems and case studies. This indicates that students' critical thinking skills, a key component of HOTS, still need to be improved. To address this, the school has begun implementing an in-depth learning approach in economics lessons through learning models such as problem-based learning, project-based learning, and case studies. However, the effectiveness of in-depth learning in improving students' HOTS has not been empirically proven.

Theoretically, the above phenomenon can be studied through in-depth learning rooted in the theory of social constructivism, as Lev Vygotsky stated that knowledge is built through social interaction (Maghfiroh & Muttaqin, 2025; Tasos, 2024). This approach focuses on social learning, commonly known as social constructivism theory. Vygotsky proposed the importance of the Zone of Proximal Development (ZPD) and scaffolding, meaning that knowledge is not constructed individually, but rather through social interaction, collaboration, and learning experiences with teachers and peers (Eun, 2019; Lerch et al., 2009). From this perspective, learning occurs when students actively engage in discussion, problem solving, and collaboration to create shared meaning.

In practice, deep learning-oriented instruction provides a pedagogical foundation for enhancing HOTS (Higher Order Thinking Skills), but this does not happen automatically. This is where learning engagement plays a crucial role as a mechanism connecting teaching strategies with HOTS development (Li et al., 2023; Lu et al., 2025). Learning engagement includes behavioral, cognitive, and emotional dimensions that are reflected through participation (Burke et al., 2025; Wang et al., 2021). Vygotsky explains that knowledge is built through social interaction, collaboration, and dialogue within the ZPD (Zone of Proximal Development) (Khor & Stanlaw, 2020; Vygotsky et al., 2012). In economics learning, this involvement becomes even more important because achieving learning outcomes in economics requires the ability to connect concepts with economic phenomena and policy evaluation.

However, most studies still treat these relationships separately and focus on limited contexts. Research by Zhao & Fu, (2025) showed that AI-assisted deep learning successfully improved HOTS in engineering students in China. This finding is supported by (Alfiyana et al., 2026), which found that deep learning has an impact on HOTS in biology learning in Indonesia. In contrast, research by (Lu et al.,2025) revealed that learning engagement is important to support students' ongoing HOTS. Deep learning is also a key factor in good learning engagement (Yanping et al., 2025).

From this review, there is a research gap because there is limited research integrating these constructs into a single conceptual model to explain the mechanisms linking deep learning-oriented teaching is associated with HOTS through learning engagement as a mediating variable. This study shows that Deep Learning-Oriented Teaching does not have a significant direct relationship with HOTS, but is related to HOTS through Learning Engagement as the main psychopedagogical mechanism. In addition, previous studies were conducted in different contexts, educational levels, and subject areas, such as engineering education, biology, and AI-assisted learning, so the findings cannot be generalized to economics learning at the secondary school level, which is an issue in this study.

Based on the issues and research gaps that have been explained, the objectives of this research are: (1) analyzing relationships in-depth learning-oriented teaching towards students' HOTS in economics learning; (2) analyzing relationships in-depth learning-oriented teaching towards learning engagement; (3)verify relationship learning involvement towards HOTS; and (4) determine the mediating role of learning engagement in the relationship between deep learning-oriented teaching and HOTS. The novelty of this research lies in the model based on social constructivist theory with learning engagement as a link and context in economics learning, which has not been widely explored.

The theoretical contribution of this research is to strengthen the social constructivism perspective and literature by integrating deep learning strategies and student engagement in building effective learning experiences, resulting in a comprehensive understanding of pedagogical processes in economics education. Practically, this research can serve as a foundation and strategy for economics schools and teachers in designing deep learning that maximizes students' HOTS (Higher Order Thinking Skills). This is crucial for the development of learning methods and various aspects of technical support.

The hypotheses in this study are formulated as follows:

H1 : DLOT is positively related to students' Higher Order Thinking Skills (HOTS).

H2 : DLOT is positively related to students' Learning Engagement.

H3 : Learning Engagement is positively related to students' Higher Order Thinking Skills (HOTS).

H4 : Learning Engagement mediates the relationship between DLOT and students' Higher Order Thinking Skills (HOTS).

METHODS

Research Design

In order to evaluate the direct and mediating links between the variables of deep learning-oriented teaching, learning engagement, and students' HOTS, this study employed an exploratory quantitative approach. The research was carried out between April and June of 2026. The assumptions were evaluated using Partial Least Squares Structural Equation Modeling (PLS-SEM).

Data Source

The target population consists of all students of grades X and XI at SMA Negeri 4 Surabaya who are taking Economics in the 2025/2026 academic year. The population consists of eight classes, namely four grades X and four grades XI, with each class having 35 students, so the total population is 280 students. Based on a 95% confidence level and a 5% margin of error, the Raosoft Sample Size Calculator was used to estimate the minimum number of respondents. From these results, the minimum sample size obtained is 163 respondents as shown in Table 1 below:

Table 1. Respondent Characteristics

LevelClass	Number of Classes	Population	Sample
X	4	140	82
XI	4	140	81
Total	**8**	**280**	**163**

Table 2. Development Instruments

No	Variable	Dimensions	Number of Indicators	Number of Item
1	Deep Learning-Oriented Teaching (Qurrota et al., 2025)	Meaningful Learning Knowledge Transfer, Critical Reflection Self-regulated Learning	4	8
2	Learning Engagement (Li et al., 2023)	Behavioral Engagement Cognitive Engagement Emotional Engagement	3	17
3	Higher Order Thinking Skills (Li et al., 2023)	Computational Thinking Problem Solving Creative Thinking Critical Thinking	4	21

The main research instrument was a closed-ended questionnaire. Responses were measured based on agreement with each statement, which was assessed on a 5-point Likert scale, with response categories ranging from strongly disagree to strongly agree.

RESULT AND DISCUSSION

Result

External Model Evaluation

Table 3. Convergent Validity

Indicator	Factor Load	Information	P value	Information
X1.1	0.869	Fulfilled	<0.001	Fulfilled
X1.2	0.900	Fulfilled	<0.001	Fulfilled
X1.3	0.852	Fulfilled	<0.001	Fulfilled
X1.4	0.847	Fulfilled	<0.001	Fulfilled

Z1.1	0.925	Fulfilled	<0.001	Fulfilled
Z1.2	0.922	Fulfilled	<0.001	Fulfilled
Z1.3	0.930	Fulfilled	<0.001	Fulfilled
Y1.1	0.935	Fulfilled	<0.001	Fulfilled
Y1.2	0.945	Fulfilled	<0.001	Fulfilled
Y1.3	0.934	Fulfilled	<0.001	Fulfilled
Y1.4	0.986	Fulfilled	<0.001	Fulfilled

All indicators met the convergent validity criteria with factor loading above 0.70 and p-values below 0.001, indicating satisfactory convergent validity.

Table 4. Discriminant Validity X1

Indicator	Load	Cross-loading		Information
	X1	Z1	Year 1	
X1.1	0.869	0.104	-0.083	Fulfilled
X1.2	0.900	-0.093	0.187	Fulfilled
X1.3	0.852	-0.272	0.080	Fulfilled
X1.4	0.847	0.265	-0.194	Fulfilled

The test results show that all indicators in the Deep Learning-Oriented Teaching construct have a loading value (0.869–0.900) higher than the cross-loading of the Learning Engagement (Z1) and Higher Order Thinking Skills (Y1) constructs, so that the discriminatory validity of the Deep Learning-Oriented Teaching construct is considered fulfilled.

Table 5. Discriminant Validity Z1

Indicator	Load	Cross-loading		Information
	Z1	X1	Year 1	
Z1.1	0.925	0.032	-0.144	Fulfilled
Z1.2	0.922	0,000	0.056	Fulfilled
Z1.3	0.930	-0.032	0.089	Fulfilled

Each item of the learning engagement construct has a loading value ranging from 0.922–0.930, which is higher than the cross-loading value for the Deep Learning-Oriented Teaching and Higher-Order Thinking Skills constructs. This means that each indicator can differentiate the construct being measured, thus meeting the discriminant validity for the Learning Engagement construct.

Table 6. Discriminant Validity of Y1

Indicator	Load	Cross-loading		Information
	Year 1	X1	Z1	
Y1.1	0.935	-0.017	0.007	Fulfilled
Y1.2	0.945	-0.021	-0.157	Fulfilled
Y1.3	0.934	0.038	0.152	Fulfilled
Y1.4	0.986	-0.021	0.318	Fulfilled

The test results show that the indicators in the Higher Order Thinking Skills construct have high loadings, ranging from 0.934 to 0.986, and are higher than the cross-loadings in the Deep Learning-Oriented Teaching or Learning Engagement constructs. Therefore, all indicators are considered capable of specifically representing the HOTS construct, so that the discriminatory validity of the Higher Order Thinking Skills construct is considered fulfilled.

Table 7. Roots of AVE and their Correlations

Variables	Root word AVE	Cross-loading		Information
	X1	Z1	Year 1	
X1	0.867	0.743	0.670	Fulfilled
Z1	0.743	0.926	0.844	Fulfilled
Year 1	0.670	0.844	0.938	Fulfilled

The square root of the Average Variance Extracted (AVE) for each construct that shows a value greater than its relationship with others indicates the validity test findings. The Deep Learning-Oriented Teaching construct (X1) has a square root of the AVE of 0.867, which is greater than its correlation with Higher Order Thinking Skills (Y1 = 0.670) and Learning Engagement (Z1 = 0.743). Similarly, the Learning Engagement construct (Z1) has a square root of AVE of 0.926, which is greater than its correlation with X1 (0.743) and Y1 (0.844). Furthermore, the Higher Order Thinking Skills construct (Y1) shows a square root of AVE of 0.938, higher than its correlation with X1 (0.670) and Z1 (0.844). The measurement model meets the validity criteria.

Table 8. Composite Reliability

Variables	Composite Reliability Coefficient	Information
X1	0.924	Fulfilled
Z1	0.947	Fulfilled
Year 1	0.956	Fulfilled

The composite reliability results presented in Table 6 show that all coefficients exceed the recommended limit value of 0.70, which confirms adequate reliability.

Table 9. Cronbach's Alpha Coefficient

Variables	Cronbach's Alpha Coefficient	Information
X1	0.890	Fulfilled
Z1	0.917	Fulfilled
Year 1	0.932	Fulfilled

Each construct showed a Cronbach's alpha value exceeding 0.70, reflecting satisfactory internal consistency reliability.

Table 10. Model Suitability Evaluation

Model Suitability and Quality Indicators	Compliance Criteria	Results	Information
Average path coefficient (APC)	P < 0.05	0.539 (P<0.001)	Meets the requirements of the appropriate model
Average R-squared (ARS)	P < 0.05	0.539 (P<0.001)	Meets the requirements of the appropriate model
Adjusted mean R-squared (AARS)	P < 0.05	0.635 (P<0.001)	Meets the requirements of the appropriate model
Average block VIF (AVIF)	It is sufficient if <= 5, ideally <= 3.3	2,193	Ideal
Average full collinearity VIF (AFVIF)	It is sufficient if <= 5, ideally <= 3.3	3,384	Ideal
Tenenhaus GoF (GoF)	small >= 0.1, medium >= 0.25, large >= 0.36	0.728	Big
Simpson's paradox ratio (SPR)	It is sufficient if >= 0.7, ideally = 1	1,000	Ideal
R-squared contribution ratio (RSCR)	It is sufficient if >= 0.9, ideally = 1	1,000	Ideal
Statistical suppression ratio (SSR)	It is sufficient if >= 0.7	1,000	Accepted
Nonlinear bivariate causality direction ratio (NLBCDR)	It is sufficient if >= 0.7	1,000	Accepted

The fit and quality indexes of the model confirmed satisfactory model fit, with all values meeting the recommended criteria (APC = 0.539, $p < 0.001$; ARS = 0.539, $p < 0.001$; AARS = 0.635, $p < 0.001$; AVIF = 2.193; AFVIF = 3.384; GoF = 0.728; SPR, RSCR, SSR, and NLBCDR = 1.000). These findings indicate that the proposed structural model is suitable for hypothesis testing.

Internal Model Evaluation

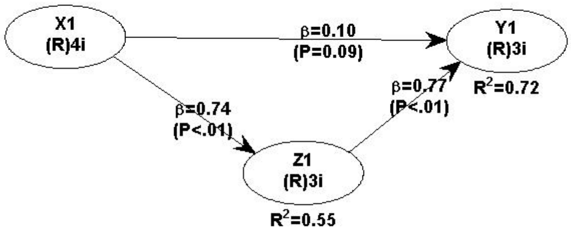

Figure 1. Relationship between variables

Table 11. Direct Effects

Relationship between variables (Exogenous variables -> Endogenous variables)		Path Coefficient	P value	Information
Deep Learning-Oriented Teaching	Learning Engagement	0.745	<0.001	Very Significant
Deep Learning-Oriented Teaching	Higher Order Thinking Skills	0.101	0.089	Not Significant
Learning Engagement	Higher Order Thinking Skills	0.772	<0.001	Very Significant

H1. Relationship between Deep Learning-Oriented Teaching and Learning Engagement

The test results show that Deep Learning-Oriented Teaching has a positive impact on Learning Engagement with a path coefficient of 0.745 and a p-value <0.001. This positive coefficient indicates that the better the implementation of Deep Learning-Oriented Teaching, the higher the students' Learning Engagement in economics learning. In addition, a p-value of less than 0.001 indicates that the association is highly significant. Therefore, H1 is accepted.

H2. Relationship between Deep Learning-Oriented Teaching and Higher-Order Thinking Skills

The analysis results show that Deep Learning-Oriented Teaching has a path coefficient of 0.101 on Higher Order Thinking Skills (HOTS) with a p-value of 0.089. Although the path coefficient is positive, the p-value is above 0.05, so the result is not significant. This finding indicates that the implementation of Deep Learning-Oriented Teaching is not directly related to students' HOTS in economics learning. The insignificant result is an important finding that the relationship between deep learning-oriented teaching and HOTS occurs through learning engagement. Thus, H2 is not supported.

H3. Relationship between Learning Engagement and Higher-Order Thinking Skills

The test results show that Learning Engagement has a positive impact on Higher-Order Thinking Skills with a path coefficient of 0.772 and a p-value <0.001. A positive path coefficient indicates that the higher the student's engagement in the learning process, the higher their higher-order thinking skills. A p-value less than 0.001 indicates that this impact is highly significant. Therefore, H3 is accepted.

Table 12. Indirect Effects

Exogenous Variables	Mediation	Endogenous Variables	Path Coefficient	P value	Information
Deep Learning-Oriented Teaching	Learning Engagement	Higher Order Thinking Skills	0.575	<0.001	Full Mediation

H4. The Mediating Role of Learning Engagement in the Relationship of Deep Learning-Oriented Teaching and Higher-Order Thinking Skills.

The test results show that the indirect impact of Deep Learning-Oriented Teaching on Higher-Order Thinking Skills through Learning Engagement has an estimated coefficient of 0.575 with a p-value <0.001. The positive coefficient indicates that Deep Learning-Oriented Teaching can improve HOTS by increasing students' Learning Engagement. In addition, a p-value of less than 0.001 indicates that this indirect effect is highly significant. Therefore, H4 is accepted. Based on the results of the direct and indirect effects tests, the type of mediation that occurs is full mediation.

Discussion

Relationship between Deep Learning-Oriented Teaching and Learning Engagement in Economics Learning

The implementation of Deep Learning-Oriented Teaching at SMA Negeri 4 Surabaya highlights the importance of this method in creating learning experiences that make students feel personally involved in understanding economics. Deep Learning-Oriented Teaching positions students as the primary actors in the classroom.

This process provides a reason for students to engage in learning because the material is perceived as relevant to their life experiences (Alzubaidi et al., 2021; Hermida, 2014; Shaik et al., 2025).

Based on the literature on the dimensions of learning engagement measurement, emotional intelligence stands out. The dominance of emotional engagement indicates that the successful implementation of Deep Learning-Oriented Teaching in economics learning begins with the formation of students' emotional attachment to the learning activities. Students are initially interested in the economic issues discussed, enjoy them, and then feel that their opinions are valued in group discussions. When teachers present economics lessons with deep learning, students are encouraged to engage because economic phenomena feel relevant to them (Maxnun & Sadiah, 2025; Panigoro et al., 2025).

From the perspective of Social Constructivism Theory, students construct knowledge through social interactions with peers and teachers (Milutinović, 2011; Ramaila, 2026). In this situation, teachers provide support in the form of thought-provoking questions, feedback, and conceptual clarification so that students can reach a level of understanding they could not achieve on their own. This is driven by the engaging nature of economics learning, which relates to everyday life, such as inflation, rising prices of basic necessities, unemployment, the digital economy, and entrepreneurship—phenomena students encounter every day through the media and their surroundings.

This research is in line with the study by Yanping et al., (2025), which shows that deep learning encourages high interaction and understanding, so that learning engagement becomes consistent. This also broadens the implications of the research (Essahraui et al., 2026). Deep learning models have been used to monitor and predict student participation and provide real-time feedback to educators. Therefore, deep learning in economics needs to be maintained to maintain student engagement, which is the driving force behind successful learning outcomes.

Relationship between Deep Learning-Oriented Teaching and Higher-Order Thinking Skills in Economics Learning

An interesting finding is that Deep Learning-Oriented Teaching does not automatically produce good HOTS (Higher Order Thinking Skills) in students. In the context of secondary school economics learning, the problems typically do not have a single, absolute solution and require multidimensional analysis. For example, exploring economic phenomena such as fiscal policy or consumer behaviour. These activities do not always engage all students in deep cognitive processing. Some students may only participate procedurally, meaning the implementation of Deep Learning-Oriented Teaching may not be fully effective.

The relationship between Deep Learning-Oriented Teaching and HOTS in this study is more mediated by students. In other words, learning effectiveness is determined more by how students respond to the learning experience (Shehu et al. , 2025; Xu, 2024), rather than by the teaching model itself. Two classes can implement the same teaching model but produce different levels of HOTS if the quality of student learning engagement differs. Learning design is a necessary, but not sufficient, condition for developing HOTS in this study. The social learning environment is also important for creating scaffolding, negotiating meaning, and good internalization.

This finding is different from Zhao & Fu, (2025), which emphasizes that deep learning can directly impact HOTS. This difference may be due to variations in the operationalization of deep learning in AI, which encourages students to directly engage in cognitive activation and metacognitive regulation. This study focuses on the context of the pedagogical approach, so success is closely related to students' conditions and perspectives. Therefore, economics teachers need to monitor the extent to which students engage in argumentation, reflection, and evidence-based reasoning during lessons.

Relationship between Learning Engagement and Higher-Order Thinking Skills in Economics Learning

The development of students' Higher-Order Thinking Skills (HOTS) in economics classes at SMA Negeri 4 Surabaya depends critically on learning engagement. These findings suggest that the level of student participation during the learning process has an impact on higher-order thinking skills. Students typically have more possibilities to develop higher-order thinking skills when they actively participate in discussions and make their points. Students can convert learning experiences into more methodical thought processes through the mechanism of learning engagement.

The enhancement of HOTS in economics learning is more reflected in the development of critical thinking dispositions than simply cognitive problem-solving abilities. The dominance of emotional engagement and critical thinking tendencies as the preferred dimensions of learning engagement and HOTS suggests that emotional engagement is a prerequisite for the development of critical thinking dispositions in students. This needs to be prioritized and maintained by teachers. Critical thinking tendencies are a manifestation of the development of higher-order mental functions, as described by Vygotsky (Subbotsky, 2014; Veresov & Mok, 2018).

These results empirically support the study by Arthana et al., (2024) which maps HOTS (Higher Order Thinking Skills) which are closely related to learning engagement through various interactive media. Furthermore, these results also expand on the findings Li et al., (2023) which focuses on HOTS for complex programming learning in China. This similarity in results can be explained because programming and economics both require students to address ill-structured problems, that is, problems that lack a single correct answer and require analysis, evaluation, and decision-making.

There are practical implications to be drawn from this fact. Developing HOTS (Higher Order Thinking Skills) in economics learning should focus on designing lessons that enhance emotional engagement as a key factor in fostering critical thinking dispositions. Economics teachers need to create activities that spark epistemic curiosity, such as analyzing current economic data, debating public policy, simulating economic decision-making, and evaluating alternative solutions to real-life economic problems (Kuo, 2023; Shalikha, 2024). The results of this study indicate the need to strengthen lesson designs that emphasize cognitive activation and critical reflection so that student learning engagement develops optimally.

The Mediating Role of Learning Engagement in the Relationship between Deep Learning-Oriented Teaching and Higher-Order Thinking Skills in Economics Learning

Deep Learning-Oriented Instruction does not directly enhance HOTS, but rather works through psychological mechanisms that encourage student engagement in learning economics in this study. The findings suggest that the relationship between learning strategies and HOTS is mediated by the learner. This is in line with research by Lu et al., (2025) which proposes that deep learning-oriented teaching focuses on active participation, critical thinking, and meaningful knowledge construction, which directly enhances HOTS. This also supports the findings of Li et al., (2023) which focuses on learning programming.

In Social Constructivism Theory, the development of higher-order mental functions occurs when learners internalize social experiences into their individual cognitive structures (Subbotsky, 2014; Vygotsky et al., 2012). In this study, Deep Learning-Oriented Teaching provided a space for students to engage in collaborative inquiry and negotiation of meaning through analysis of phenomena in economics lessons, group discussions, and case study completion. However, these activities do not automatically generate HOTS (Higher Order Thinking Skills) if students are not cognitively engaged with the learning experience. It is important to note that learning engagement acts as a mechanism that enables internalization at the individual level (Gao et al., 2024; Miao et al., 2022; Zheng & Pan, 2025).

Practically, these findings highlight the need to monitor the implementation of Deep Learning-Oriented Teaching in schools, not only based on syntax, but also on the quality of the resulting Learning Engagement. Economics teachers need to design activities that encourage epistemic curiosity and evidence-based decision-making, so that students are not only behaviourally active but also engaged in deep cognitive processing. At the school level, these results imply the need for learning evaluation indicators that also measure the level of Learning Engagement as a key indicator for the development of HOTS (Higher Order Thinking Skills).

CONCLUSION

Deep Learning-Oriented Teaching (DLOT) has a positive relationship with to direct learning engagement, while learning engagement also interacts well with HOTS (Higher Order Thinking Skills). There is no significant direct relationship between DTT and students' HOTS; however, the relationship is fully mediated by learning engagement. In SMA Negeri 4 Surabaya, the nature of DTT and students' HOTS is mediated by the students. The internalization process is the primary mechanism that bridges the transformation of learning experiences into higher mental functions. The practical implications of this study emphasize that schools need to improve the evaluation of the success of DTT implementation based on the quality of Learning Engagement. Economics teachers need to design learning activities that facilitate argumentative discourse, reflective inquiry, and evidence-based decision-making. A limitation of this study is that it was conducted on a single school population, so the findings should be generalized with caution. Future studies are recommended to use longitudinal or experimental designs to gain deeper insights and enrich the framework by including other mediating or moderating variables, such as self-regulated learning, academic resilience, or the use of Artificial Intelligence.

SUGGESTION

Based on the research findings, economics teachers are advised to focus not only on implementing Deep Learning-Oriented Teaching but also on enhancing student learning engagement through learning activities that encourage active participation, argumentative discussion, reflection, and contextual problem-solving. High student engagement is a crucial factor in supporting the development of Higher Order Thinking Skills (HOTS). For schools, evaluating the implementation of immersive learning should consider the Learning Engagement aspect as an indicator of the success of the learning process. School support in providing an interactive and collaborative learning environment can help improve the quality of student engagement. For future researchers, it is recommended to use more objective HOTS measurement instruments, such as performance tests or authentic assessments, to provide a more comprehensive picture of students' higher-order thinking abilities. Furthermore, future research could involve a broader population and consider other variables that could potentially act as mediators or moderators, such as self-regulated learning, academic resilience, and digital literacy.

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