

The urgency of the discovery learning model with a meaningful learning approach to enhance students critical thinking skills

Dwi Prasetyo ¹, Endang Mulyani ¹

¹ Universitas Negeri Yogyakarta, Indonesia

 dwiprasetyo.2024@student.uny.ac.id

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Abstract: In today's world, critical thinking skills are essential for teaching economics. An initial observation at SMAN 2 Tulang Bawang Udik also indicated that the existing teaching methods did not support the development of higher-order thinking skills among students. This study was conducted to determine whether a combination of discovery learning and meaningful learning principles is necessary to foster critical thinking skills among students. A qualitative descriptive approach was employed, involving a sample of 60 grade 10 learners, 2 economics teachers, classroom observations, student surveys, and both structured and semi-structured interviews. Results showed that during lessons, 88% were passive, 62 per cent were below the minimum competency level, and 87% experienced difficulties with abstraction. Furthermore, 85% of students felt that the learning approach was overly theoretical, while most preferred a discovery-based approach. Teachers supported the use of innovative learning models. These results underscore the urgent need for an integrated economics curriculum that incorporates student-centred teaching through discovery and meaningful learning environments to enhance critical thinking skills.

Keywords: critical thinking; discovery learning; meaningful learning; economics education; structured abstract

Introduction

The ability to think critically has always been an important educational skill to master, but it is especially relevant during the technological boom of the twenty-first century. Discovery learning is one technique that has the potential to foster critical thinking. During discovery learning, students take the initiative to search for information and knowledge, which contributes to the development of critical thinking abilities and a more thorough learning experience. Students' active participation in the learning process is achieved through their involvement in hands-on experiences, from which they can generate questions, conduct investigations, and draw conclusions. These are theories of experiential and inquiry-based learning (Aristeidou et al., 2020; Mao, 2023). According to Facione (1990) and Ennis (2015), critical thinking is defined as a higher-order reflective judgment process that enables learners to determine which beliefs to accept and which actions to take. In the context of this study, critical thinking is regarded as a fundamental outcome of education in economics today.

The idea of meaningful learning, which aims to establish a connection between newly acquired information and knowledge that has been previously learnt, is yet another important concept in the field of education. Learning can be made simpler if one is able to relate new information to what one has already learnt. This is especially true when the new material is incorporated into the mental frameworks that have already been established. The idea that learning is improved when previous experiences are taken into consideration is supported by Ausubel (1968). According to Ausubel, prior experiences contribute to learning by enhancing comprehension and promoting greater retention of information. The incorporation of significant learning into the curriculum is expected to enhance the critical thinking skills of high school students, particularly in the context of economics education. In the constructivist approach to learning, students actively build knowledge by interacting with tasks, their peers, and prior ideas, rather than by passively receiving information from instructors. Both meaningful learning and discovery learning are founded on this constructivist perspective (Bruner, 1977; Vygotsky & Cole, 1978). This constructivist grand theory provides the overarching framework that establishes the connection between inquiry, prior knowledge, and the development of higher-order thinking abilities.

According to the findings of several studies, the pedagogical approach known as Discovery Learning is effective in enhancing students' critical thinking abilities. For example, Manurung & Pappachan (2025) found that modules based on Discovery Learning enhance critical thinking skills, particularly in decision-making. This finding is consistent with the results of Chusni et al. (2020) who noted that students' involvement in discovery processes that involve a significant burden greatly improves their intellectual abilities, particularly their capacity for critical thinking. These studies emphasise the significance and effectiveness of various learning methods founded on discovery and reasoning abilities, which are of utmost importance in the contemporary world. Despite this, the majority of these empirical investigations have been carried out in the fields of science and mathematics, and they primarily investigate discovery learning or meaningful Learning as discrete interventions rather than as a unified pedagogical framework that is explicitly intended to promote higher-order thinking skills (HOTS) (Hoerudin, 2023).

In terms of economics, the implementation of the discovery learning method enables students to gain an understanding of the theoretical aspects of the economy and apply this knowledge in practice. The cultivation of higher-order thinking skills, also known as HOTS, is promoted using this method. This includes the acquisition of abilities such as analysis, evaluation, and creation, all of which are essential for success in the twenty-first century (Ismail et al., 2020). As a result, the combination of discovery learning and meaningful learning has the potential to effectively enhance the critical thinking abilities of secondary school students. However, in the context of secondary

school economics in Indonesia, systematic efforts to create, implement, and evaluate a model of discovery learning based on higher-order thinking skills (HOTS) and integrated with meaningful learning are still limited and not well-documented (Boulatoﬀ & Cyrus, 2022; Ismail et al., 2020).

As a result, the literature contains both empirical and conceptual gaps. In a conceptual sense, there is a need to clearly articulate how constructivism, meaningful learning theory, and higher-order thinking skills (HOTS) frameworks can be integrated into a unified and comprehensive grand design for economics learning that explicitly promotes the development of students' critical thinking skills. From an empirical standpoint, it can be observed that a limited number of investigations have documented research on the development of models that convert these theoretical commitments into specific lesson sequences, learning resources, and assessment strategies aligned with the characteristics of Indonesian secondary school students and curricula. By undertaking and examining the investigation of a learning model founded on strong theoretical principles and grounded in context, this study addresses these shortcomings.

The current research project aims to establish and confirm a model for discovery learning that is based on higher-order thinking skills (HOTS) and incorporates meaningful learning for use in secondary school economics curricula. This goal is being pursued in light of the theoretical foundation established and the identified gap in the literature. More specifically, the study aims to achieve the following objectives: (1) the creation of a model that is based on constructivist and meaningful learning theories; (2) the implementation of the model in economics classrooms to investigate the potential impact it may have on students' critical thinking skills and other higher-order thinking skills; and (3) the analysis of the perceptions of both teachers and students regarding the practicality and acceptability of the model when it is applied in a typical classroom setting. It is anticipated that the research will make a contribution to the improvement of economic learning theory and to the development of an evidence-based educational model that strengthens the critical thinking abilities of secondary school students. This contribution is expected to be realised through the achievement of the study's objectives.

Method

This study employed qualitative descriptive methods to explore the importance of creating Discovery Learning instructional models integrated with Meaningful Learning principles, aiming to foster critical thinking among students in economics classes. This methodology suits best because it helps to understand educational phenomena systematically and holistically, as well as from deeper perceptive angles pertaining to events taking place within the school, for example, the learning experiences of Form X students at SMAN 2 Tulang Bawang Udik. The research subjects included 60 Grade X students and two economics faculty members. The population was chosen purposefully based on the appropriateness of the payment system topic within economics, as well as the teachers' pedagogical skills and experience in conducting economics classes. The sample was chosen through random sampling.

This study aimed to achieve its objectives through the use of three methods: direct observation, questionnaires, and semi-structured interviews. During the observations, participants were monitored during lessons to assess the student-teacher engagement and pinpoint problems in instructional delivery. Students were given questionnaires to assess their appreciation for learning about the meaningful payment system concept, as well as its application in other contexts. In-depth interviews were also conducted with the economics teachers to gather their views on the effectiveness of the teaching techniques used in class, their willingness to adopt HOTS learning, and their reactions to the suggestion of designing a Discovery Learning approach based on Meaningful Learning principles.

The evaluation tools were developed from the perspectives of learning tasks, perceptions of the teaching model, and the educator's engagement in the innovation processes related to teaching. Validation is where experts who specialise in economic pedagogy and teaching design were brought in to evaluate how correctly the instruction materials were for their intended purpose. Validation involved assessing the relevance, clarity, and appropriateness of the indicators in relation to the observation's objectives. The synthesis from the validators showed that most indicators were both readable and relevant, which meant the instruments met the usability criteria. Suggestions from the validators were also incorporated to modify the wording of certain items and use simpler terms more suitable for the users in the discipline. Therefore, the validated, uncontextualized instruments for observation are expected to assist in efficiently pinpointing areas that require the creation of tailored learning models, which foster the development of critical thinking among students.

As with all the data collected in this study, a qualitative descriptive approach was taken to analyse it. The analysis process was broken down into three major steps: data reduction, data display, and conclusion drawing. These steps were organised according to the qualitative data analysis framework put forward by Miles and Huberman. This framework supports researchers in achieving a comprehensive understanding of the pressing need to develop an instructional model that aims to enhance critical thinking skills among learners

Table 1. Observation Instrument Grid

No	Observed Aspect	Indicator	Rating Scale
1	Student Learning Activity	Students pay attention to explanations, ask questions, and answer teacher's questions	Scale 1–5
2	Discussion Participation	Students actively participate in discussions and material exploration	Scale 1–5
3	Teachers Use of Learning Model	Teachers provide open-ended questions, encourage students to express opinions, and guide the discovery process	Scale 1–5

Table 2. Student Questionnaire Instrument Grid

No	Indicator	Statement	Scale	Purpose
1	Difficulty in understanding the concept	I have difficulty understanding the concept of chemical bonding	Scale 1–5	To understand students' perceptions
2	Views on learning methods	Learning is too theoretical and lacks visual elements	Scale 1–5	To assess the current learning method
3	Need for learning variation	Students are open to trying different learning methods than before	Scale 1–5	To measure interest in learning innovation
4	Interest in contextual learning	I want the teacher to relate the material to real-life situations	Scale 1–5	To measure interest in meaningful learning

Table 3. Interview Instrument Grid

No	Interview Focus	Question	Purpose
1	Learning Challenges	What are the main challenges in teaching the topic of the payment system?	To explore teachers' difficulties
2	Learning Media	Is the current model used already effective?	To assess the effectiveness of the learning model
3	Response to Learning Model Innovation	What is your opinion about the innovation of discovery learning combined with meaningful learning for the payment system?	To explore the potential support for meaningful learning

The data gathered from observations will be evaluated descriptively using a rating scale reflecting student engagement in relation to the teaching strategies employed by the educator. Each observation will be condensed to identify salient behavioural themes among the students and their participatory levels throughout different phases of the learning activity. Concurrently, data from the student questionnaires will be analysed based on their frequency and percentage distribution to provide measurable response patterns for determining the level of students' interest and attitudes toward significant learning in relation to the instructional design provided. Furthermore, data from the teacher interviews will be analysed using thematic inquiry by sorting the transcripts into specific themes relevant to the interview questions posed. The integrated analysis of these three data sources will enable the formation of initial insights into the necessity of creating a more appropriate learning model intended to enhance students' essential analytical thinking skills.

Results and Discussion

Findings

Based on classroom observations and documentation of the economics lesson for Grade X students at SMAN 2 Tulang Bawang Udik, it became clear that their learning engagement was quite low for most students. Out of a sample of 60 students, 88% could be categorised as passive learners who only listened to the teacher explain concepts without actively asking questions or engaging in discussions. The teacher leaned heavily on lecturing and did not incorporate any student-centred learning models that would require students' participation. Moreover, analysis of daily tests concerning the payment system revealed that 62% of learners had not achieved the identified milestones, scoring below the KKM 77 threshold for minimum acceptable performance. These findings suggest that there are gaps in the teaching approaches and the pedagogy that align with students' comprehension levels.

Table 4. Results of Economics Learning Observation in Grade X SMAN 2 Tulang Bawang Udik

Observed Aspect	Findings
Student activity during learning	88% of students were inactive
Student participation in discussions	Most students were passive
Use of learning model by the teacher	Contextual learning model not yet applied
Achievement of learning mastery	62% of students did not meet the minimum passing grade (score < 77)

According to a survey conducted among students, 87% reported difficulties understanding cashless payment systems, digital wallets, and non-cash payment methods. Additionally, 85% of them believed that learning economics was mostly theoretical, with little practical application. Furthermore, 80% of students showed interest in the discovery models of learning, which relate to the real world. Students claimed that understanding concepts was much easier when they were presented through real-life examples.

Table 5. Results of the Student Needs Questionnaire on Economics Learning

Statement	Agreement Percentage
I have difficulty understanding the concept of the payment system.	87%
Economics learning contains too much theory.	85%
I am interested in trying a discovery-based learning model.	80%
I want the teacher to relate the material to real-life situations.	84%

Hearing the economics teacher's interview, which confirmed the results from the observations and questionnaires, was interesting. As the teacher explained, the lack of creativity in teaching the payment system model has been a significant barrier to students learning the payment system model. Additionally, the teacher explained that applying a contextual learning theory rooted in meaningful learning would help present the economic system more interactively and concretely.

Discussions

The results of this study reveal a substantial gap between the learning practices currently employed and the competencies required in 21st-century education, particularly in critical and higher-order thinking. The high proportion of passive students (88%) and the significant number failing to meet mastery standards (62%) illustrate that teacher-centred instruction limits opportunities for deeper cognitive engagement. As Anderson & Krathwohl (2001) emphasised, such surface-level approaches rarely support the progression toward analysis, evaluation, and creation. This issue aligns with the findings of previous studies, which suggest that traditional pedagogical approaches often fail to adequately prepare students for the cognitive demands of the 21st century, where critical thinking and problem-solving are paramount (Sayed & Ahmed, 2015).

The lack of student engagement and the emphasis on rote learning in the observed classes suggest that the current teaching model does not align with the skills necessary for success in the digital age. Research has shown that integrating active learning models, such as inquiry-based learning and project-based learning, can significantly enhance students' critical thinking abilities and their overall academic performance (Freeman et al., 2014). These models foster an environment where students not only consume knowledge but actively construct it, encouraging a deeper understanding of content. In the context of economics education, this approach could bridge the gap between theory and practice, providing students with the tools to critically analyse complex concepts such as digital wallets and cashless payment systems (Boud & Falchikov, 2007).

Ausubel's theory of meaningful learning (1968) helps explain why students struggle with abstract concepts, such as digital wallets and cashless payments. Without connecting new information to existing knowledge, learning remains rote and fragmented. This finding is consistent with the survey results, which indicate that most students considered economics to be overly theoretical and preferred lessons that were tied to real-life contexts. Their interest in contextual and discovery-based learning confirms that relevance and prior experience are essential for deeper understanding.

Bruner's (1977) discovery learning framework also clarifies students' enthusiasm for inquiry-oriented methods. By encouraging active investigation and problem-solving, discovery learning enables students to construct their own meaning. This is supported by previous research (Chusni et al., 2020; Hoerudin, 2023; Manurung & Pappachan, 2025), which demonstrated that discovery learning strengthens reasoning skills and motivation. Integrating discovery with meaningful learning, therefore, presents a promising approach to enhance comprehension of abstract material while fostering critical thinking.

The fact that instructors were able to recognise the limitations of lecture-based instruction and were open to the idea of implementing contextual approaches further confirmed this interpretation. The discoveries made contribute to both theoretical and practical understanding. Theoretical findings contribute by combining two learning models that are typically studied in isolation from one another. In a practical sense, the findings contribute by providing educators with strategies for designing lessons that are exploratory, contextual, and student-centred.

The educators' acknowledgement of the necessity of incorporating teaching methods that are more engaging and centred on the student is in line with the current trends in the field of education. These trends emphasise the importance of active learning as a fundamental component in the development of critical thinking and problem-solving abilities (Freeman et al., 2014). This transition towards more participatory pedagogical methods, such as meaningful learning and discovery learning, represents a necessary departure from traditional methods that are dominated by

teachers. This is because these approaches have been shown to be more aligned with the cognitive demands of learners in the twenty-first century.

Nevertheless, it is essential to consider the limitations of the study. The study's findings cannot be generalised to other contexts with different student populations and educational structures, as the research was conducted in only one school setting. According to Cohen et al. (2017), research limited to a single institution may not accurately reflect the diverse range of obstacles and opportunities present in various educational settings. The results will be further validated if future research includes multiple schools from diverse geographical and socioeconomic contexts. This would help ensure that the findings are more widely applicable and provide a more thorough understanding of how these learning models operate in various educational environments.

The descriptive, qualitative design of the study represents another limitation, as it is rich in detail but does not provide evidence of causal relationships between the variables. According to Creswell (2014), while qualitative research is exceptionally effective in investigating phenomena in an in-depth manner, it frequently lacks the capacity to make direct cause-and-effect inferences. The utilisation of mixed-methods or experimental research designs may prove to be advantageous in future research. These design approaches would enable a more thorough analysis of the direct effects that integrating discovery learning and meaningful learning has on students' academic success and critical thinking abilities. This would not only strengthen the internal validity of the findings but it would also provide empirical evidence on the effectiveness of these pedagogical models.

Despite these limitations, the findings of this research underscore the pressing need for educational reforms that extend beyond traditional lecture-based teaching methods. The fact that educators have expressed a favourable opinion about the implementation of contextual learning methods that place students at the centre of the learning process indicates that they are receptive to novel ideas and enthusiastic about the prospect of enhancing their instructional techniques. This is substantiated by research conducted in the past (Liu & Lin, 2014), which has placed significant emphasis on the importance of providing educators with support and professional development in the process of incorporating active learning strategies. In general, the research contributes to the growing body of literature that supports the notion of transitioning towards educational experiences that are more interactive, relevant, and meaningful. It emphasises the potential of discovery learning and meaningful learning as successful pedagogical models for increasing student engagement and promoting critical thinking skills.

Conclusion

The study highlights the need to revamp teaching practices in economics, particularly when addressing complex topics like payment systems. Traditional lecture-oriented methods have been shown to restrict students' engagement and critical thinking, while both learners and teachers have demonstrated a willingness to adopt discovery and meaningful learning strategies. From a practical standpoint, the results suggest that instructional practices should be redesigned to emphasise contextual and learner-centred approaches. Such approaches involve inquiry-based activities, integration of real-life examples, and interactive classroom dialogue, all of which can bridge the divide between theoretical content and practical application. At the institutional level, teacher training and professional development are crucial for preparing educators to implement discovery learning and meaningful learning effectively.

Future investigations should move beyond the descriptive nature of this study. Employing experimental or mixed-method designs could provide stronger evidence of causal relationships between the integrated model and improvements in student

outcomes. Comparative studies across various school settings would also help determine the model's broader relevance, while further research might examine how digital platforms and blended learning environments can facilitate the adoption of this approach. Overall, this research makes both theoretical and applied contributions by highlighting the advantages of integrating discovery learning with meaningful learning. Although the study was limited to a single school context, its implications reinforce the potential of contextualised, exploratory, and student-driven learning models in enhancing the quality of economics education and in equipping students with the critical thinking skills necessary for 21st-century demands.

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