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Enhancing Student Participation and Learning Outcomes Through Quantum Learning in Economics Classrooms

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[1*]Safik Nur Taufiq, [2]Nofita Lestariningsih, [3]Denok Mugi Hidayanti
[1,2,3]Program Studi Pendidikan Ekonomi FKIP,
Universitas PGRI Argopuro (UNIPAR) Jember
[1,2,3]Jl. Jawa No. 10, Tegal Boto Lor, Sumbersari, Kabupaten Jember,
Jawa Timur. Indonesia
E-mail: [1]khotkhufi2017@gmail.com, [2]usmankurniawan.muk@gmail.com,*
[3]denokmh2012@gmail.com

*Corresponding Author

Abstrak—Studi ini mengeksplorasi penerapan model *Quantum Learning* dalam pendidikan ekonomi di MA As-Surur Silo Jember dan meneliti bagaimana guru dan siswa memandang pengaruhnya terhadap keterlibatan kelas dan pengalaman belajar. Kajian sebelumnya umumnya berfokus pada pengukuran efektivitas *Quantum Learning* melalui pendekatan kuantitatif, sedangkan penelitian yang mengkaji proses implementasinya dalam konteks madrasah masih relatif terbatas. Penelitian ini berkontribusi dalam memperluas pemahaman mengenai *Quantum Learning* sebagai pendekatan pedagogis yang mampu menciptakan pembelajaran yang partisipatif, kontekstual, dan berpusat pada peserta didik. Penelitian menggunakan pendekatan kualitatif deskriptif dengan melibatkan 18 informan yang terdiri atas satu guru ekonomi, dua pengelola madrasah, dan lima belas peserta didik. Data dikumpulkan melalui observasi, wawancara semi-terstruktur, dan dokumentasi. Analisis data dilakukan melalui proses reduksi data, penyajian data, interpretasi, dan penarikan kesimpulan. Temuan menunjukkan bahwa penerapan *Quantum Learning* dikaitkan dengan lingkungan pembelajaran yang lebih interaktif, partisipatif, dan kontekstual. Peserta menggambarkan keterlibatan siswa yang lebih besar, kepercayaan diri, dan motivasi selama kegiatan kelas. Guru dan siswa juga merasakan bahwa proses pembelajaran mendukung siswa dalam mengaitkan konsep ekonomi dengan situasi kehidupan nyata serta mendorong pengalaman belajar yang lebih bermakna. Temuan ini menunjukkan bahwa *Quantum Learning* menyediakan pendekatan pedagogis yang relevan untuk mempromosikan pembelajaran berpusat pada siswa di kelas Ekonomi dalam konteks madrasah.

Kata Kunci: *Quantum Learning;* Pembelajaran Ekonomi; Keterlibatan Peserta Didik; Hasil Belajar.

Abstract—*This study explores the implementation of the Quantum Learning model in Economics education at MA As-Surur Silo Jember. It examines how teachers and students perceived its influence on classroom engagement and learning experiences. While previous studies have largely emphasized the effectiveness of Quantum Learning through quantitative measurements, limited research has explored its implementation within the contextual setting of Islamic secondary education. This study addresses this gap by proposing a contextual understanding of how Quantum Learning fosters meaningful and student-centered learning experiences in Economics classrooms. A qualitative descriptive approach was employed, involving 18 informants: one Economics teacher, two school administrators, and fifteen students. Data were collected through classroom observations, semi-structured interviews, and document analysis. The data were analyzed through data reduction, data organization, interpretation, and conclusion drawing to identify patterns related to instructional practices and learning experiences. The findings indicate that the implementation of Quantum Learning was associated with a more interactive, participatory, and contextual learning environment. Participants described greater student engagement, confidence, and motivation during classroom activities. Teachers and students also perceived that the learning process supported students in relating economic concepts to real-life situations and fostered more meaningful learning experiences. These findings suggest that Quantum Learning provides a relevant pedagogical approach for promoting student-centered learning in Economics classrooms within the madrasah context.*

Keywords: *Quantum Learning; Economics Education; Student Engagement; Learning Outcomes.*

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I. INTRODUCTION

Education aims to develop students' intellectual, social, and problem-solving capacities through meaningful learning experiences [1]. Consistent with constructivist principles and the Merdeka Curriculum, learning should encourage students to actively construct knowledge through interaction, inquiry, and authentic experiences rather than passively receiving information from teachers [2], [3]. In Economics education, this approach is particularly important because students are expected not only to understand theoretical concepts but also to apply economic reasoning and decision-making skills to real-life situations. Therefore, effective Economics instruction requires learning models that promote active participation, contextual learning, and meaningful engagement with economic issues [4].

Despite the important role of Economics education in developing students' economic literacy and decision-making skills, classroom practice often remains dominated by teacher-centered instruction [5]. Many students continue to perceive Economics as an abstract and theory-oriented subject, resulting in limited classroom participation, low learning engagement, and difficulties in connecting economic concepts with everyday experiences. These classroom conditions reduce opportunities for students to actively construct knowledge and participate meaningfully in the learning process.

In the context of madrasahs education, the challenge becomes even more complex because Economics education is not only aimed at achieving academic competence but also at instilling social values, responsibility, and wise resource management [6]. Based on the results of the pre-observation at MA As-Surur Silo Jember, there are still students who are less active in learning, have not optimally linked economic concepts with everyday life realities, and show a significant variation in learning motivation among students. These conditions indicate the need for a learning model that can create an engaging, enjoyable, and meaningful learning atmosphere, making it easier for students to understand economic concepts comprehensively.

One alternative considered relevant to address this issue is the implementation of the Quantum Learning model. This model emphasizes the creation of a positive learning environment thru the TANDUR steps (Grow, Experience, Name, Demonstrate, Repeat, and Celebrate), so that learners not only receive information but also experience, practice, and reflect on the knowledge learned [7]. Research shows that Quantum Learning can enhance learning motivation, student

engagement, and learning outcomes because it provides a broader space for students to participate in the learning process actively [8].

The urgency of research on Quantum Learning in Economics education is becoming stronger because several empirical studies have shown the effectiveness of this model in improving students' academic achievements. Agustini et al., in their study, found that Quantum Learning has a positive impact on students' learning outcomes thru increased activity and engagement in the classroom [9]. The research shows that students who learn using Quantum Learning achieve better results compared to students who follow conventional learning. In addition, other studies have also shown that the use of Quantum Learning can enhance students' learning motivation and cognitive abilities across various fields of study.

Various previous studies have examined the implementation of Quantum Learning from different perspectives. Nurfadilah and Nurachadijat's research found that Quantum Learning can enhance students' learning activities in Fiqh lessons [8]. Mayasari and Harahap's research showed an increase in mathematical creative thinking skills after the implementation of Quantum Learning [10]. The application of Quantum Learning significantly improved the completeness of students' learning outcomes [11]. These findings demonstrate the consistency that Quantum Learning contributes to the improvement of the quality of learning and student learning outcomes.

Nevertheless, most previous research still focuses on testing the influence of Quantum Learning on learning outcomes thru quantitative and experimental approaches. Research specifically examining how the implementation process of Quantum Learning occurs in context-based madrasah Economics learning is still relatively limited. In addition, previous research has been more focused on public schools, whereas the characteristics of learning in madrasahs have different social, cultural, and religious contexts, necessitating a separate study [12]. These conditions indicate that there is still room for research to deeply explore how Quantum Learning is applied in Economics education within the Madrasah Aliyah environment.

Based on the aforementioned description, this research starts from the argument that the implementation of Quantum Learning has the potential to be an effective pedagogical strategy in improving the quality of Economics learning at MA As-Surur Silo Jember. Thru the creation of an active, enjoyable, and meaningful learning environment, this model is believed to enhance student engagement, facilitate the understanding of economic concepts, and support the achievement of more optimal learning outcomes. The novelty of this research lies in its focus, which not only examines the impact of Quantum Learning on learning outcomes but also delves

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deeply into the implementation patterns, learning dynamics, and supporting and inhibiting factors of Quantum Learning application in the Economics subject at MA As-Surur Silo Jember. Thus, this research is expected to enrich the body of knowledge in economic education while also providing practical recommendations for the development of more innovative learning in the madrasah environment.

II. METHOD

This study employed a qualitative descriptive approach to explore the implementation of the Quantum Learning model in Economics education at MA As-Surur Silo Jember. This approach was considered appropriate because the study sought to understand instructional practices, classroom interactions, and participants' experiences within their natural educational setting rather than to examine causal relationships or measure the effectiveness of the learning model. The research was conducted during the second semester of the 2025/2026 academic year at MA As-Surur Silo Jember, which was purposively selected because it had implemented Quantum Learning in Economics classes. Participants were selected using purposive sampling based on their direct involvement in the learning process. A total of eighteen participants were involved, comprising one Economics teacher, two school administrators, and fifteen students who had experienced the implementation of Quantum Learning in classroom instruction [13].

Data were collected through classroom observations, semi-structured interviews, and document analysis to obtain comprehensive information regarding the implementation of Quantum Learning. Classroom observations focused on instructional activities, teacher–student interactions, student participation, and the application of Quantum Learning principles during Economics lessons. Semi-structured interviews were conducted with teachers, school administrators, and students to explore their experiences and perceptions of the learning process. At the same time, document analysis included lesson plans, teaching modules, learning materials, students' assignments, and assessment documents. The combination of these data sources enabled the researchers to examine the phenomenon from multiple perspectives and to strengthen the completeness of the research findings [14].

Data analysis was conducted simultaneously with the data collection process through an iterative procedure involving data organization, coding, categorization, interpretation, and conclusion drawing. Observation notes, interview transcripts, and documentary evidence were repeatedly reviewed to identify recurring patterns related to instructional practices, classroom

dynamics, and participants' learning experiences. The findings from different data sources were continuously compared through methodological and source triangulation to ensure consistency of interpretation. In addition, member checking was conducted with selected participants to verify the accuracy of the researchers' interpretations, while peer discussion among the research team was undertaken to minimize subjective bias and enhance the credibility, dependability, and confirmability of the findings [15].

III. RESULTS AND DISCUSSIONS

Based on the results of observations, interviews, and documentation analysis conducted during the research, a number of findings were obtained that show how the implementation of the Quantum Learning model takes place in Economics learning at MA As-Surur Silo Jember and its impact on the learning process and outcomes of students. These findings indicate that the application of Quantum Learning is not only oriented toward material delivery but also includes lesson planning, the implementation of student-centered learning activities, the creation of participatory interactions, and the development of contextual learning experiences. Additionally, implementing this model contributes to improving conceptual understanding, learning participation, motivation, self-confidence, and the quality of students' learning experiences. To provide a more systematic and comprehensive overview of the research focus, categories of findings, results, and data sources obtained, the research results are presented in the following table and in the discussion section in general.

TABLE 1. SYNTHESIS OF RESEARCH FINDINGS ON THE IMPLEMENTATION OF QUANTUM LEARNING IN ECONOMICS EDUCATION

Research Focus	Key Findings	Research Findings	Data Sources
Implementation of Quantum Learning in Economics Education	Learning Planning	The Economics teacher systematically prepared instructional materials, learning activities, and classroom strategies aligned with students' learning needs and the objectives of Economics instruction.	Document Analysis, Teacher Interviews
	Learning Implementation	Economics instruction was conducted through interactive, student-centered, and contextual learning activities that encouraged active engagement throughout the learning process.	Classroom Observations, Interviews
	Classroom Interaction	The implementation of Quantum Learning fostered meaningful interactions between teachers and students as well as among students, creating a more collaborative and participatory learning environment.	Classroom Observations, Interviews
	Contextual Learning Experiences	Economic concepts were consistently linked to real-life economic issues and students' everyday experiences, enabling students to develop a more meaningful understanding of the subject matter.	Classroom Observations, Teacher and Student Interviews

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Lanjutan Tabel 1

Research Focus	Key Findings	Research Findings	Data Sources
Outcomes of Quantum Learning Implementation	Conceptual Understanding and Academic Achievement	Students demonstrated improved understanding of economic concepts and achieved better learning outcomes compared to their previous learning experiences.	Academic Records, Teacher Interviews
	Learning Participation	Students became more actively involved in classroom discussions, question-and-answer sessions, collaborative activities, and presentations.	Classroom Observations, Interviews
	Learning Motivation	Students showed greater enthusiasm, interest, and commitment toward learning Economics following the implementation of Quantum Learning.	Classroom Observations, Student Interviews
	Self-Confidence	Students exhibited increased confidence in expressing opinions, presenting ideas, and participating in classroom discussions.	Classroom Observations, Interviews
	Learning Experience	Students perceived Economics learning as more engaging, enjoyable, relevant, and meaningful to their daily lives.	Student Interviews

The Dynamics of Implementing Quantum Learning in Creating an Active Learning Environment

During classroom observations, the researchers found that the implementation of Quantum Learning shifted the classroom atmosphere from teacher-dominated instruction to more participatory learning activities. Rather than relying primarily on lectures, the teacher encouraged students to discuss economic issues in small groups, present their ideas, and respond to their classmates' opinions. Most students participated voluntarily during discussions and appeared more willing to communicate their ideas than during the preliminary observation. This classroom interaction created opportunities for students to construct their understanding through dialogue and collaborative learning.

The interview data supported these observations. The Economics teacher explained:

> *"Students are now more confident to express their opinions because learning is no longer focused only on listening to explanations. They are encouraged to discuss, ask questions, and relate economic concepts to situations they encounter in everyday life."*

Similarly, one student stated:

> *"Learning Economics feels more interesting because we discuss real problems that happen around us. It makes the lesson easier to understand and encourages everyone to participate."*

These findings indicate that both teachers and students perceived the implementation of Quantum Learning as creating a more interactive and student-centered learning environment.

Rather than functioning solely as a strategy for delivering content, the learning model encouraged active participation and collaborative knowledge construction throughout the instructional process [16]. Thus, the active involvement of students during the learning process becomes a factor that contributes to the formation of a deeper and more meaningful understanding. These findings are in line with various studies that affirm that a learner-centered approach to education can enhance participation, cognitive engagement, and the quality of students' learning experiences [17].

Other findings show that Quantum Learning creates more intensive interactions between teachers and students as well as among students. A more communicative and participatory learning atmosphere allows students to feel more comfortable expressing their opinions, asking questions, and contributing to the learning process [18]. From a pedagogical perspective, this condition indicates that social interaction plays an important role in the process of knowledge construction. When students have the opportunity to engage in dialog and exchange ideas, they do not just passively receive information, but also engage in a process of negotiating meaning regarding the material being studied [19]. In the context of Economics learning, such interactions allow students to understand economic concepts more contextually because the learning is developed thru the experiences and realities they face daily. These findings reinforce previous research that shows Quantum Learning can enhance students' motivation, engagement, and participation by creating a more interactive and enjoyable learning environment [20].

The research results also show that teachers consistently relate Economics material to economic phenomena that are close to the students' lives. These findings are significant because they show that the effectiveness of Quantum Learning lies not only in engaging learning activities but also in its ability to provide contextual learning experiences. Material that is linked to the realities of students' lives is easier to understand because students can see the direct relevance between the concepts being studied and the situations they experience. In the context of a madrasah situated in a community with diverse economic activities, a contextual approach allows students to develop a more applicable understanding of economics that is not limited to theoretical aspects alone. Therefore, learning becomes more meaningful because students are able to construct knowledge based on their real experiences [21]. These findings are in line with research that states that Quantum Learning is effective in building meaningful learning thru the integration of cognitive, emotional, and social aspects of students in a holistic learning experience.

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Based on the overall findings, the researchers argue that the implementation of Quantum Learning in Economics education at MA As-Surur Silo Jember not only serves as a strategy to enhance students' learning activities but also as a means to build a more participatory, communicative, and contextual learning culture. The success of this model is evident in its ability to create stronger connections between learning materials, student experiences, and social interactions in the classroom. In other words, Quantum Learning provides space for students to take the lead in the learning process, while the teacher acts as a facilitator guiding the creation of meaningful learning experiences. This finding also reinforces previous research on the subject of Economics, which shows that Quantum Learning can improve the quality of the learning process by creating a comfortable, active, and enjoyable learning atmosphere, making it easier for students to understand the material being studied.

Strengthening Learning Outcomes and Student Engagement thru the Implementation of Quantum Learning

During interviews, both teachers and students described changes in how students engaged with Economics learning after the implementation of Quantum Learning. Classroom observations also showed that students participated more actively in discussions, responded to questions without hesitation, and were able to explain economic concepts using examples from their daily experiences. The teacher reported that students demonstrated a deeper understanding of learning materials because classroom activities emphasized exploration and discussion rather than memorization.

> One student explained:
>
> *"Previously, I only memorized the material for examinations. Now I understand why economic concepts are important because we discuss situations that happen in everyday life."*
>
> Another participant added:
>
> *"Working in groups and presenting our ideas makes us more confident to speak and helps us understand the lesson better."*

These findings suggest that students perceived meaningful changes in their learning experiences following the implementation of Quantum Learning. Rather than emphasizing academic achievement alone, participants described improvements in classroom participation, conceptual understanding, communication, and confidence. These experiences indicate that meaningful learning emerged through active engagement with authentic learning activities [22].

The improvement in learning outcomes cannot be separated from the characteristics of Quantum Learning, which places students as the main actors in the learning process. Research findings indicate that students have greater opportunities to ask questions, engage in discussions, express ideas, and present their thoughts. This active engagement contributes to the process of knowledge internalization because learners do not merely receive information but also process, interpret, and communicate the knowledge they have acquired, a process that is considered essential for meaningful learning and knowledge construction [23]. From a pedagogical perspective, this condition suggests that learning environments that provide greater opportunities for participation tend to produce deeper understanding than teacher-centered and one-way instructional approaches [24]. The results of this study are consistent with previous research indicating that Quantum Learning can improve learning outcomes by strengthening students' cognitive and affective engagement throughout the learning process [9].

Research findings also show that the improvement in learning outcomes goes hand in hand with increased participation and motivation among students. The students' courage to ask questions, express opinions, and engage in group discussions indicates a change in the affective aspect of learning. This finding suggests that Quantum Learning not only influences the cognitive dimension but also creates psychological conditions that support the learning process. A more comfortable, communicative, and interactive learning atmosphere makes students feel safer to express their thoughts without worrying about making mistakes, which is essential for fostering motivation and meaningful engagement in learning activities [25]. These conditions ultimately enhance students' attention, focus, and commitment to learning activities. These findings reinforce previous studies demonstrating that positive and interactive learning environments are significantly associated with higher levels of student motivation, engagement, and academic achievement [26].

Furthermore, the research results show that the success of Quantum Learning in improving learning outcomes is not only due to the use of particular instructional strategies but also its ability to create meaningful learning experiences. When Economics content is connected to students' real-life experiences, learning becomes more relevant, understandable, and applicable to everyday situations. Under such conditions, students no longer perceive learning materials as abstract concepts to be memorized but as knowledge that has practical value and direct relevance to their lives. This finding is consistent with the principles of authentic and contextual learning, which emphasize the importance of connecting academic content to real-world situations in order

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to promote meaningful understanding and long-term engagement [27]. Furthermore, the improvement in learning outcomes identified in this study can be understood as the result of the integration of active student engagement, contextual learning experiences, and a supportive learning environment, all of which have been recognized as important determinants of student success and meaningful learning [28].

Based on the overall findings, the researchers argue that Quantum Learning functions not only as a learning model that enhances academic achievement but also as a pedagogical approach that strengthens the quality of students' learning experiences. The improvement in learning outcomes found in this study indicates that the success of Economics learning is not solely determined by mastery of the material, but also by how students interact with the material, with the teacher, and with their learning environment. In other words, Quantum Learning is capable of bridging the needs of 21st-century learning, which requires students not only to understand concepts but also to think critically, communicate, collaborate, and connect knowledge with real-life situations. Therefore, the implementation of Quantum Learning can be viewed as a relevant strategy to support the improvement of the quality of Economics education in madrasah environments and to encourage the formation of more active, meaningful, and sustainable learning.

IV. CONCLUSION

This study provides a contextual understanding of how Quantum Learning was implemented in Economics education at MA As-Surur Silo Jember. The findings suggest that teachers and students perceived the learning model as supporting a more participatory, interactive, and contextual learning environment in which students were encouraged to engage actively in classroom discussions, relate economic concepts to everyday experiences, and communicate their ideas with greater confidence. Rather than emphasizing instructional outcomes alone, the study highlights the importance of meaningful classroom interactions and authentic learning experiences as central elements of the implementation process.

An important contribution of this study lies in demonstrating how Quantum Learning can be understood within the specific context of madrasah-based Economics education. The findings indicate that the value of the learning model is closely associated with its ability to facilitate student-centered learning practices that accommodate both academic learning and contextual understanding. However, these findings should be interpreted within the scope of this qualitative

study and are not intended to be generalized to other educational settings. Future research involving different school contexts and complementary research approaches may provide broader evidence regarding the implementation of Quantum Learning across diverse learning environments.

REFERENCES

[1] O. Zhukova, L. Platash, and L. Tymchuk, "Inclusive Education as a Tool For Implementing the Sustainable Development Goals on the Basis of Humanization of Society," *Problemy Ekorozwoju*, vol. 17, no. 1, pp. 114–122, Jan. 2022, doi: 10.35784/pe.2022.1.11.

[2] A. Saleem, H. Kausar, and F. Deeba, "Social Constructivism: A New Paradigm in Teaching and Learning Environment," *Perennial Journal Of History*, vol. 2, no. 2, pp. 403–421, Dec. 2021, doi: 10.52700/pjh.v2i2.86.

[3] M. hifdhul I. Q. Zidna, M. Y. A. Bakar, and Zakariyah, "Transformasi Pembelajaran Berbasis Kurikulum Merdeka Melalui Pendekatan Konstruktivistik," *Andragogi: Jurnal Pendidikan dan Pembelajaran*, vol. 5, no. 2, pp. 152–169, Sep. 2025, doi: 10.31538/adrg.v5i2.2108.

[4] F. Amri, E. T. Djatmika, H. Wahyono, and S. U. M. Widjaja, "The Effect of Using Simulation on Developing Students' Character Education in Learning Economics," *International Journal of Innovation, Creativity and Change*, 2020.

[5] M. B. Mahmudi, A. Arief, and Rehani, "Strategi Joyful Learning dalam Meningkatkan Motivasi, Keterlibatan dan Pemahaman Konsep Peserta Didik Pada Pembelajaran Pendidikan Agama Islam," *QOSIM : Jurnal Pendidikan Sosial & Humaniora*, vol. 3, no. 1, pp. 96–103, Feb. 2025, doi: 10.61104/jq.v3i1.662.

[6] H. Hafizah, M. Imamuddin, R. Widianita, H. Ridhah, and A. Anisah, "Integrasi Nilai-nilai Kewarganegaraan dan Sosial dalam Pembelajaran Ekonomi untuk Membentuk Karakter Siswa yang Berintegritas," *Jurnal Educazione : Jurnal Pendidikan, Pembelajaran dan Bimbingan dan konseling*, vol. 13, no. 2, pp. 125–134, Nov. 2025, doi: 10.56013/edu.v13i2.4862.

[7] N. D. Sari, S. Sutarto, A. R. Nasution, and D. Purnamasari, "Penerapan Quantum Learning dengan Pendekatan Neurosains dalam Pembelajaran PAI," *Jurnal Pendidikan Guru*, vol. 5, no. 1, Feb. 2024, doi: 10.47783/jurpendigu.v5i1.711.

[8] K. Nurfadilah and K. Nurachadijat, "Peran Pembelajaran Quantum Learning dalam Meningkatkan Motivasi dan Prestasi Belajar Siswa di MA AL-Istiqomah Kota Sukabumi | Jurnal Inovasi, Evaluasi dan Pengembangan Pembelajaran (JIEPP)", Accessed: Jun. 04, 2026. [Online]. Available: https://journal.ainarapress.org/index.php/jiepp/article/view/243

[9] K. Agustini, I. Santyasa, I. Tegeh, G. Santyadiputra, and I. Mertayasa, "Quantum Flipped Learning and Students' Cognitive Engagement in Achieving Their Critical and Creative Thinking in Learning," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 17, no. 18, pp. 4–25, Sep. 2022.

[10] L. Mayasari and N. A. Harahap, "Peningkatan Kemampuan Berpikir Kreatif Matematis Siswa Menggunakan Metode Quantum Teaching pada Kelas VIII SMP N 1 Merbau," *Jurnal Cendekia*, vol. 6, no. 2, pp. 1741–1750, 2022, doi: 10.31004/cendekia.v6i2.1316.

[11] M. N. Sitepu, A. Zainal, U. Nurhayani, R. Thohiri, and S. A. Silalahi, "Implementasi Model Pembelajaran Quantum Learning untuk Meningkatkan Keaktifan dan Hasil Belajar Akuntansi," *Jurnal Pendidikan Akuntansi Indonesia*, vol. 21, no. 2, pp. 01–11, Dec. 2023, doi: 10.21831/jpai.v21i2.62293.

[12] R. Rahmadi and H. Hamdan, "Religious Moderation In The Context Of Islamic Education: A Multidisciplinary Perspective And Its Application In Islamic Educational Institutions In Indonesia," *Khazanah: Jurnal Studi Islam dan Humaniora*, vol. 21, no. 1, pp. 59–82, Jul. 2023, doi: 10.18592/khazanah.v21i1.8487.

[13] M. Stanley, "Qualitative Descriptive: A Very Good Place to Start," in *Qualitative Research Methodologies for Occupational Science and Occupational Therapy*, 2nd ed., Routledge, 2023.

[14] O. Isik, "Qualitative Research Approaches and Data Collection Methods: Understanding Meaning and Experience," *International Journal of Humanities and Education Development (IJHED)*, vol. 7, no. 6, pp. 19–32, Nov. 2025, doi: 10.22161/jhed.7.6.3.

[15] F. Zhao, G.-J. Hwang, and C. Yin, "A Result Confirmation-based Learning Behavior Analysis Framework for Exploring the Hidden Reasons behind Patterns and Strategies," *Educational Technology & Society*, vol. 24, no. 1, pp. 138–151, 2021.

[16] B. S. Narmaditya, H. Wahyono, Z. Li, and S. R. Sakarji, "The Future of Economic Education: Trends and Implications for Policy and Practice," *Jurnal Pendidikan Ekonomi*, vol. 17, no. 1, pp. 51–61, Mar. 2024, doi: 10.17977/UM014v17i1p051.

[17] H. Hadiyanto, "Application of Student-Centered Learning in Improving Teaching English as a Foreign Language Students' 21st-Century Skills Performance," *Education Sciences*, vol. 14, no. 9, p. 938, Sep. 2024, doi: 10.3390/educsci14090938.

[18] M. J. Brundage, A. Malespina, and C. Singh, "Peer interaction facilitates co-construction of knowledge in quantum mechanics," arXiv.org. Accessed: Jun. 04, 2026. [Online]. Available: https://arxiv.org/abs/2311.17302v1

[19] K. S. Taber, "Educational Constructivism," *Encyclopedia*, vol. 4, no. 4, pp. 1534–1552, Dec. 2024, doi: 10.3390/encyclopedia4040100.

[20] R. Sianipar, A. Sinaga, and J. Tampubolon, "Implementation of quantum learning in english language teaching for sports students," *Priviet Social Sciences Journal*, vol. 5, pp. 40–51, Apr. 2025, doi: 10.55942/pssj.v5i4.361.

[21] N. A. Tasya, "Pengembangan Kurikulum Berbasis Kontekstual untuk Meningkatkan Kualitas Pembelajaran Di Era Merdeka Belajar," *Baitul Hikmah: Jurnal Pendidikan dan Studi Islam*, vol. 1, no. 01, pp. 44–54, Oct. 2025.

[22] I. Masrur and N. I. Maghfirah, "Incorporating Quantum Learning Model to Deep Learning Approach in English Language Teaching at MTs Bustanul Ulum, Pujer, Bondowoso," *Journal of Language, Literature, and English Teaching (JULIET)*, vol. 7, no. 1, pp. 40–50, Apr. 2026, doi: 10.31629/juliet.v7i1.7980.

[23] M. T. H. Chi and R. Wylie, "The ICAP Framework: Linking Cognitive Engagement to Active Learning Outcomes," *Educational Psychologist*, vol. 49, no. 4, pp. 219–243, Oct. 2014, doi: 10.1080/00461520.2014.965823.

[24] E. J. Theobald *et al.*, "Active learning narrows achievement gaps for underrepresented students in undergraduate science, technology, engineering, and math," *Proceedings of the National Academy of Sciences*, vol. 117, no. 12, pp. 6476–6483, Mar. 2020, doi: 10.1073/pnas.1916903117.

[25] R. M. Ryan and E. L. Deci, "Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions," *Contemporary Educational Psychology*, vol. 61, p. 101860, Apr. 2020, doi: 10.1016/j.cedpsych.2020.101860.

[26] J. A. Fredricks, M. Filsecker, and M. A. Lawson, "Student engagement, context, and adjustment: Addressing definitional, measurement, and methodological issues," *Learning and Instruction*, vol. 43, pp. 1–4, Jun. 2016, doi: 10.1016/j.learninstruc.2016.02.002.
[27] F. E. Jasper-Abowei and E. C. Victor-Ishikaku, "Contextual Learning Approach: A Tool for Enhancing Critical Thinking Skills amongst Learners'," *Central Asian Journal of Social Sciences and History*, vol. 4, no. 5, pp. 72–83, May 2023, doi: 10.17605/OSF.IO/GB2SR.
[28] G. Heilporn, A. Raynault, and É. Frenette, "Student engagement in a higher education course: A multidimensional scale for different course modalities," *Social Sciences & Humanities Open*, vol. 9, p. 100794, 2024, doi: 10.1016/j.ssaho.2023.100794.