JIPSINDO (Jurnal Pendidikan Ilmu Pengetahuan Indonesia)
ISSN: 2355-0139 (p); 2615-7594 (e)
Vol. 12. No. 2 (2025), pp. 183- 198, DOI: https://doi.org/10.21831/jipsindo.v12i2.89904

Implementing the quantum teaching to improve Social Studies learning outcomes at junior high school

by:

Rusabeata[1], **Saliman Saliman**[2], **Rusyda Nasyta Rahman**[3]
[1]SMP Negeri 1 Dusun Selatan, Barito Selatan, Central Borneo, Indonesia
[2,3] Universitas Yogyakarta, Indonesia
rusabeata59@guru.smp.belajar.id

Article History
Submitted: 23 September 2025
Revised : 28 September 2025
Accepted: 29 September 2025

Keywords: *Social Studies Quantum Teaching; Learning Outcomes; Action Research*

Abstract

This research aims to investigate the improvement of learning outcomes of Social Studies in class VIII-D of SMP Negeri 1 Dusun Selatan by the method Quantum Learning. Pre-cycle data shows that the majority of students (61%) are below the Minimum Completion Criteria (KKM) due to passive and unmotivated learning processes. The research uses the Classroom Action Research (CAR) method, which is implemented in two cycles with 31 students. The research stages include gradual interventions, where Cycle I showed initial but not optimal improvements. Based on reflection, corrective actions in Cycle II were refined by optimizing the learning environment through spatial arrangement and music, and strengthening individual accountability through independent worksheets before group discussions. The main findings show a very significant increase in learning outcomes: the number of students in the "High" and "Very High" categories jumped drastically from only 22.5% in the pre-cycle to 84% at the end of Cycle II. It was concluded that the implementation of the adaptive and holistic Quantum Teaching model has proven to be very effective in transforming the learning process and fundamentally improving student learning outcomes.

Introduction

Strategic efforts to improve the quality of human resources (HR) in the education sector depend heavily on the competence of teachers as the frontline. Teachers, who are definitely professional educators (Liza & Zudeta, 2023), hold fundamental authority and responsibility for the education of students, both inside

and outside the school environment (Masruroh et al., 2025). The quality of education itself reflects a system's ability to optimize all available resources to achieve effective learning goals (Emor et al., 2019). This aligns with the mandate of Law No. 14 of 2005 concerning Teachers and Lecturers, which emphasizes that the teaching profession encompasses the tasks of educating, teaching, and training. To optimally fulfill these duties, every teacher is required to master four core competencies, which consist of personality, professional, pedagogical, and social, which are key to a successful learning process.

Strategic efforts to improve the quality of human resources (HR) in the education sector depend heavily on the competence of teachers as the frontline. Teachers, who are professional educators (Liza & Zudeta, 2023), hold fundamental authority and responsibility for the education of students, both inside and outside the school environment (Masruroh et al., 2025). The quality of education itself reflects a system's ability to optimize all available resources to achieve effective learning goals (Emor et al., 2019). This aligns with the mandate of Law No. 14 of 2005 concerning Teachers and Lecturers, which emphasizes that the teaching profession encompasses the tasks of educating, teaching, and training. To optimally fulfill these duties, every teacher is required to master four core competencies—personality, professional, pedagogical, and social—which are key to a successful learning process.

Students' success in absorbing subject matter is greatly influenced by the learning approach and model implemented by the teacher (Sani et al., 2020). A competent teacher no longer positions themselves as the sole source of knowledge, but rather as a reliable facilitator. Ideally, teachers should be able to create a learning environment that involves active student participation, encouraging them to explore independently to discover their various potentials. The modern learning process requires teachers to consider various crucial aspects, such as multiple intelligences and each individual's readiness to learn. With this holistic approach, negative psychological impacts such as boredom, frustration, and even antipathy towards the subject can be minimized, making the learning process a more meaningful experience (Hasbollah & Hassan, 2022; Waterworth, 2020).

The Quantum Teaching learning model has been proposed as a solution. Quantum Teaching is a model designed to orchestrate an effective learning environment by utilizing various elements, from music and visualization to spatial arrangement, to provide positive suggestions. Learning is viewed as a systemic interactive process involving educators, students, and learning resources in a conducive environment (Hanida et al., 2022). Furthermore, this approach is believed to increase students' self-efficacy, or confidence in their abilities. When students consistently experience success in a positive learning environment, their perception of their own capabilities increases (Katz, 2015; Koponen et al., 2021; Kusumawati et al., 2022). Based on initial observations in class VIII-D of SMPN 1 Dusun Selatan, obstacles were found that hampered learning activities, where many students lacked confidence, had difficulty choosing vocabulary, and hesitated when speaking. From the teacher's perspective, external motivation was rarely provided, and learning was spent mostly explaining theory, resulting in very low student focus. This low engagement directly impacted their academic achievement. Social studies learning achievement data showed less than optimal results, with 21 out of 31 students still below the KKM score of 70. The condition indicates a fundamental problem that requires innovative intervention with another approach.

Method

This research was designed using the Classroom Action Research (CAR) method, implemented in two cycles. This approach was chosen to improve and enhance the quality of the learning process directly in the classroom. Each cycle in this research follows the Kemmis and McTaggart model, which consists of four systematic stages: planning, action, observation, and reflection. This research was conducted for three months, from May to July 2025, in class VIII-D of SMP Negeri 1 Dusun Selatan. The research subjects were all 31 students in the class. The action procedure carried out was the application of the Quantum Teaching learning model. At the planning stage in each cycle, the researcher, who is also a social studies teacher, prepared all learning materials, including teaching modules, student worksheets (LKPD), and observation instruments. Furthermore, at the action stage, the learning model was implemented in the teaching and learning process in the classroom.

The data collection process in this study utilized several techniques to obtain comprehensive data. Quantitative data on student learning outcomes were collected through a pre-test before the first cycle and a post-test in the form of daily tests at the end of each cycle. In addition, qualitative data were collected through observation and interviews. Observations were conducted throughout the learning process using structured observation sheets to monitor student activity, cooperation, and responsibility. Interviews were conducted to gain deeper insight into students' learning experiences. Data analysis was conducted in a combined manner; quantitative data from test results were analyzed descriptively to calculate the percentage of classical learning completion. The criteria for the success of the action were determined if at least 85% of students achieved learning completion. Student learning outcome scores were also categorized into five levels, from very high to very low (Mangge, 2025).

Result and Discussion

The initial observation activity or pre-cycle phase was carried out to map the actual learning conditions before the research intervention. This implementation took place at the end of the Even Semester of the 2024/2025 Academic Year, specifically on Monday, May 5, 2025. The learning process at this stage was carried out in accordance with the conventional Lesson Implementation Plan prepared at the beginning of the school year. The material that became the focus of this observation session was the theme of Indonesian Economic Development, with a specific sub-topic regarding Indonesian Population Dynamics. Data from this phase served as an initial benchmark.

Table 1. Pre cycle 1 outcome

No	Values	Categori	F
1	8,1 – 10	Very High	2
2	6,6 – 8,0	High	5
3	5,6 – 6,5	Medium	5
4	4,1 – 5,5	Low	9
5	0 – 4,0	Very Low	10
	Total		31

Table 1 presents the distribution of cognitive learning outcomes for 31 students in the pre-cycle phase, before the implementation of the research actions. The data clearly indicate a fundamental problem, with the majority of students concentrated in the low category. Specifically, 19 students (61%) fell into the Low and Very Low categories, the largest group. Conversely, only 7 students achieved the High and Very High categories. This initial condition confirms the low student learning outcomes and provides strong justification for implementing corrective actions.

The planning stage of Cycle I began with an in-depth analysis of the problems identified in the pre-cycle, namely, low social studies learning outcomes. Based on this analysis, researchers designed initial interventions by compiling a Lesson Implementation Plan (RPP) that adopted the basic framework of the Quantum Teaching model. Primary preparation included the creation of a syllabus and teaching modules tailored to the core material of Indonesian Economic Development. Furthermore, researchers developed supporting instruments such as Student Worksheets (LKPD) designed for group work to spark initial discussions. Data collection instruments were also carefully prepared, including observation sheets to monitor teacher and student activities and formative test questions to measure cognitive achievement at the end of the cycle.

During the implementation phase of Cycle I, the researcher acted as the teacher and implemented the planned lesson plan. Learning activities began with an effort to create a more positive atmosphere compared to the pre-cycle conditions. The teacher presented the Indonesian Economic Development material with a more varied approach, reducing the dominance of the lecture method. Students were then organized into groups to work on the prepared worksheets (LKPD), where they were encouraged to discuss and exchange ideas. Throughout this process, the teacher acted as a facilitator, providing guidance and direction to each group. Although two-way interaction began to develop, the primary focus remained on introducing the new model and familiarizing students with group work patterns. The session concluded with a learning outcome test.

Table 2. Cycle 1 Learning Outcomes

No	Values	Categori	F
1	8,1 – 10	Very High	3
2	6,6 – 8,0	High	6
3	5,6 – 6,5	Medium	14
4	4,1 – 5,5	Low	6
5	0 – 4,0	Very Low	2
Total			31

Table 2 presents the distribution of learning outcomes for 31 students after the implementation of the interventions in Cycle I. The data indicate positive improvements from the pre-cycle conditions, with the largest group of students, 14, now in the Medium category. The number of students in the Low and Very Low categories decreased drastically to only 8. Meanwhile, 9 students have successfully achieved the High and Very High categories. These results indicate that the initial intervention was successful, but still needs to be optimized in the next cycle.

In the reflection phase of Cycle I, the researchers and collaborators concluded that initial actions were successful in reducing the number of students in the low category and increasing enthusiasm. However, it was identified that achievement was still concentrated in the Medium category due to several weaknesses, such as in-depth group interactions and a suboptimal classroom atmosphere, according to the principles of Quantum Teaching. Based on these findings, a series of corrective actions was formulated for Cycle II. These improvements covered three main areas: optimizing the learning environment by rearranging the classroom and adding instrumental music; deepening the material by encouraging the use of more diverse learning resources, such as the internet and libraries; and increasing interaction through the use of more communicative language and the distribution of individual worksheets before group discussions. These strategic steps were designed to address existing weaknesses and encourage an increase in student learning outcomes from the "Medium" to "High" category.

Based on the results of the Cycle I reflection, the Cycle II planning phase focused on significantly refining the intervention. Researchers revised the Lesson

Implementation Plan (RPP) to integrate elements designed to deepen interaction and optimize the learning environment. Specifically, instrumental music was prepared to accompany the learning sessions to create a more conducive atmosphere. The strategy for completing the Student Worksheets (LKPD) was changed; students would first receive the LKPD individually to stimulate independent thinking before formulating it in group discussions. Furthermore, researchers prepared a guide for students to access a wider variety of learning resources, such as the internet and the school library, to enrich the material. The classroom was also reorganized to support more fluid and interactive group dynamics.

During the implementation phase of Cycle II, corrective actions were implemented comprehensively. The learning process began with arranging the classroom and playing soft instrumental music to create a calm and focused atmosphere. As planned, the teacher distributed worksheets to each student to work on individually, giving them time to process the information independently. Afterward, students joined their groups to discuss and collaborate on their individual thinking. During the discussions, the teacher actively circulated, using more conversational language to facilitate, and encouraged students to seek additional references from various prepared sources. This approach effectively increased individual accountability and the depth of group discussions, which culminated in the completion of the Cycle II learning outcome test.

Table 3. Cycle 2 Learning Outcomes

No	Value	Categori	F
1	8,1 – 10	Very High	7
2	6,6 – 8,0	High	19
3	5,6 – 6,5	Medium	4
4	4,1 – 5,5	Low	1
5	0 – 4,0	Very Low	0
Total			**31**

Table 3 presents data on student learning outcomes after the implementation of corrective actions in Cycle II. The results demonstrate a dramatic improvement and the success of the study. The majority of students, 26 (84%), are now

concentrated in the High and Very High categories. The number of students in the lower categories decreased sharply, with the Very Low category being eliminated. This achievement confirms that the strategies refined in this cycle have proven highly effective in significantly optimizing student learning outcomes.

In the reflection phase of Cycle II, researchers and collaborators conducted a comprehensive analysis of all collected data. It was concluded that the implemented corrective actions had achieved optimal results and successfully addressed the learning issues completely. A significant shift occurred, with the majority of students (84%) now in the High and Very High categories, and the lowest category had been eliminated. This success was attributed to the effectiveness of the refined strategies: optimizing the learning environment through spatial arrangement and music, deepening material from various sources, and increasing interaction through individual worksheets. Considering that all indicators of research success had been achieved and even exceeded, it was agreed that this classroom action research was declared successful and was terminated at the end of Cycle II.

Discussion

The pre-cycle data analysis provided a clear diagnostic picture of the initial learning conditions, revealing serious problems related to students' cognitive learning outcomes. With 61% of students concentrated in the "Low" and "Very Low" categories, these findings indicate that previously implemented conventional learning methods tended to be passive and failed to stimulate meaningful student engagement. This low achievement was not simply a matter of scores but rather a reflection of a less conducive learning environment and teaching strategies that were unable to effectively accommodate students' learning needs. This situation provides strong justification for implementing a transformative pedagogical intervention through classroom action research, adopting the Quantum Teaching model, which philosophically aims to orchestrate a more dynamic, positive, and student-centered learning atmosphere and process (Harnoto et al., 2021; Sibarani, 2021).

The implementation of Cycle I marked the initial stage of the intervention, which demonstrated positive but limited results. A significant shift occurred, with most students successfully moving out of the lowest category and concentrating in

the "Medium" category. This improvement confirmed that the implementation of basic Quantum Teaching elements, such as group work using Student Worksheets (LKPD), successfully provided an initial stimulus that increased student enthusiasm and participation. However, critical reflection revealed that this success was not optimal. Group interactions tended to be shallow, and Quantum Teaching principles related to optimizing the learning environment were not fully implemented. The failure to push learning outcomes to a higher category suggests that simply forming discussion groups is not enough; a deeper structure and a more supportive environment are needed to facilitate a truly constructive learning process (Side & Munawwarah, 2025; Tanjung et al., 2019).

One key factor that differentiated and drove the dramatic success in Cycle II was a strategic modification in the workflow of the Student Worksheet (LKPD). The shift from purely group assignments to an individual approach before group discussions proved highly effective. This strategy directly addressed the weaknesses identified in Cycle I by instilling the principle of individual accountability. By requiring each student to process information and formulate ideas independently, the researchers ensured that no student could be passive or solely dependent on their group mates. This fundamentally changed the dynamics of group discussions; collaboration sessions no longer began from scratch but instead became rich forums for sharing, debating, and synthesizing ideas that each member had considered, significantly increasing the depth and quality of interactions (Afiyah & Zulkarnaen, 2025; Khoiroh et al., 2025; Suhandri et al., 2019).

In addition to strengthening the task structure, the success of Cycle II is also significantly influenced by optimizing the learning environment, a fundamental pillar of the Quantum Teaching model. Actions that may seem simple, such as rearranging the classroom to encourage interaction and playing soothing instrumental music, have profound psychological impacts (Kekare, 2015; Khatimah, 2021; Muchsinan et al., 2024). A more fluid spatial arrangement reduces the rigid and formal atmosphere, while music helps reduce anxiety and creates a more relaxed and conducive atmosphere for thinking. These changes in the physical and auditory environment serve as catalysts, creating conditions in which students feel more comfortable, safe, and motivated to engage in the learning process (Purwanti

et al., 2025). This demonstrates that affective and environmental factors play a role no less important than cognitive strategies in determining student learning success (Li et al., 2023).

Efforts to deepen the material through the use of more diverse learning resources in Cycle II also contributed significantly to improving learning outcomes. By encouraging students to seek additional references from the internet and libraries, teachers effectively shifted the learning paradigm from one centered on textbooks to a broader inquiry-based approach. This step not only enriched the content of the material students learned but also trained information literacy skills and learning independence (Annisha, 2024; Tilke, 2019). Students were encouraged to become active learners in seeking and evaluating information, rather than simply passive recipients. Exposure to diverse perspectives and richer data enabled them to develop a more comprehensive and nuanced understanding, ultimately reflected in their ability to achieve learning outcomes in the "High" and "Very High" categories (Ulfa et al., 2021).

Conclusion

The Quantum Teaching model is implemented reflectively and adaptively. The journey from pre-cycle to the end of Cycle II demonstrates how a series of targeted improvements can fundamentally transform student learning outcomes, marked by the elimination of the "Very Low" category and the concentration of the majority of students at the highest levels. However, it must be acknowledged that, as a case study limited to a single classroom, these findings have limitations in terms of generalizability. Nevertheless, this study presents a powerful and inspiring implementation model, illustrating how a teacher can act as a researcher to diagnose problems, design theory-based solutions, and systematically improve the quality of learning to achieve optimal outcomes for all students.

This classroom action research convincingly demonstrates that the implementation of an adaptive and reflective Quantum Teaching model can fundamentally transform student learning outcomes. The success of this research lies not in a single intervention, but rather in the synergy of several strategic improvements. The journey from initial shallow enthusiasm to deep understanding

was achieved through a combination of strengthening individual accountability before group work, optimizing a conducive learning environment, and broadening horizons through the use of diverse learning resources. This study confirms that the success of an innovative learning model depends on a holistic orchestration that systematically shifts students' roles from passive recipients to active, independent, and collaborative learners, ultimately achieving optimal outcomes.

References

Afiyah, A. N., & Zulkarnaen, Z. (2025). Penerapan inkuiri terbimbing untuk meningkatkan keterampilan berpikir kritis dan kolaborasi siswa pada pembelajaran ipas sd. *SOCIAL Jurnal Inovasi Pendidikan IPS*, *5*(2), 306. https://doi.org/10.51878/social.v5i2.5033

Annisha, D. (2024). Integrasi penggunaan kearifan lokal (local wisdom) dalam proses pembelajaran pada konsep kurikulum merdeka belajar. *Jurnal Basicedu*, *8*(3), 2108. https://doi.org/10.31004/basicedu.v8i3.7706

Emor, A. C. J., et al. (2019). Pengaruh tingkat pendidikan orang tua terhadap pendidikan anak di kelurahan pinasungkulan kecamatan ranowulu kota bitung. *Jurnal Civic Education Media Kajian Pancasila Dan Kewarganegaraan*, *3*(1), 45. https://doi.org/10.36412/ce.v3i1.907

Han, M., et al. (2020). Analysis of extension strategies for improving adaptive teaching ability of college teachers. *International Journal of Emerging Technologies in Learning (iJET)*, *15*(15), 147. https://doi.org/10.3991/ijet.v15i15.15927

Hanida, R. S., et al. (2022). The effectiveness of using audio-visual media in the learning process of islamic culture history (ski) subject at man 1 mandailing natal. *Islamic Education*, *2*(2), 20. https://doi.org/10.57251/ie.v2i2.678

Harnoto, B. T., et al. (2021). The implementation of the quantum teaching strategy with multiple intelligence approach at state senior high school. *IJORER International Journal of Recent Educational Research*, *2*(1), 73. https://doi.org/10.46245/ijorer.v2i1.78

Hsbollah, H. M., & Hassan, H. (2022). Creating meaningful learning experiences with active, fun, and technology elements in the problem-based learning

approach and its implications. *Malaysian Journal of Learning and Instruction*, *19*. https://doi.org/10.32890/mjli2022.19.1.6

Katz, S. (2015). Enhancing self-efficacy of elementary school students to learn mathematics. *Journal of Curriculum and Teaching*, *4*(1). https://doi.org/10.5430/jct.v4n1p42

Kekare, S. H. (2015). Classroom physical environment and academic achievement of students. *International Journal of Indian Psychology*, *2*(3). https://doi.org/10.25215/0203.055

Khatimah, H. (2021). Major impact of classroom environment in students' learning. *Journal of Education Review Provision*, *1*(1), 12. https://doi.org/10.55885/jerp.v1i1.42

Khoiroh, M., et al. (2025). Upaya peningkatan konsep diri melalui layanan bimbingan kelompok dengan teknik diskusi kelompok peserta didik. *MANAJERIAL Jurnal Inovasi Manajemen Dan Supervisi Pendidikan*, *5*(1), 90. https://doi.org/10.51878/manajerial.v5i1.4916

Koponen, T., et al. (2021). Benefits of integrating an explicit self-efficacy intervention with calculation strategy training for low-performing elementary students. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.714379

Kusumawati, A. R., et al. (2022). The effectiveness of group counseling in overcoming students self-confidence problems. *Social Humanities and Educational Studies (SHEs) Conference Series*, *5*(2), 398. https://doi.org/10.20961/shes.v5i2.59369

Li, J., et al. (2023). Investigating latent interactions between students' affective cognition and learning performance: Meta-analysis of affective and cognitive factors. *Behavioral Sciences*, *13*(7), 555. https://doi.org/10.3390/bs13070555

Liza, L. O., & Zudeta, E. (2023). Scientific writing training to advance teacher professionalism competence. *Journal of Community Engagement Research for Sustainability*, *3*(2), 108. https://doi.org/10.31258/cers.3.2.108-114

Mangge, M. R. I. (2025). Meningkatkan hasil belajar siswa melalui model pembelajaran problem based learning berbantuan media kincir air pada materi perubahan bentuk energi kelas iv di sd. *SCIENCE Jurnal Inovasi*

Pendidikan Matematika Dan IPA, *5*(2), 909. https://doi.org/10.51878/science.v5i2.5719

Masruroh, C., et al. (2025). Peran guru dalam mengembangkan kurikulum merdeka di smp it al-ittihad salaman. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *5*(1), 322. https://doi.org/10.51878/learning.v5i1.4148

Muchsinan, K., et al. (2024). Pengaruh project based learning dan gaya belajar terhadap kemampuan berpikir kritis dan hasil belajar matematika. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *4*(1), 9. https://doi.org/10.51878/learning.v4i1.2717

Nurgiansah, T. H., et al. (2021). Penelitian tindakan kelas dalam pendidikan kewarganegaraan. *Jurnal Pendidikan PKN (Pancasila Dan Kewarganegaraan)*, *2*(1), 10. https://doi.org/10.26418/jppkn.v2i1.41752

Purwanti, S., et al. (2025). Peran manajerial kepala sekolah dalam mutu pembelajaran di sd negeri tonjong 01 kecamatan tonjong kabupaten brees. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *5*(1), 266. https://doi.org/10.51878/learning.v5i1.4335

Salsabila, A., et al. (2025). Berpikir induktif sebagai dasar kompetensi sikap kritis bagi peserta didik generasi millenial abad 21. *CENDEKIA Jurnal Ilmu Pengetahuan*, *5*(1), 264. https://doi.org/10.51878/cendekia.v5i1.4465

Sani, A. W., et al. (2020, January 1). Learning model in elementary school saren 1 elementary school, kalijambe subdistrict, sragen regency. *Proceedings of the 3rd International Conference on Learning Innovation and Quality Education (ICLIQE 2019)*. https://doi.org/10.2991/assehr.k.200129.075

Sibarani, B. E. (2021). Analysis of the effect of the implementation of the quantum teaching method on accounting learning in class xi ips sma n 1 laguboti. *Aptisi Transactions On Technopreneurship (ATT)*, *3*(1), 1. https://doi.org/10.34306/att.v3i1.129

Side, S., & Munawwarah, M. (2025). Pembelajaran berbasis studi kasus dalam pendidikan kimia: Pemahaman dan analisis, evaluasi motivasi, keterlibatan mahasiswa. *SCIENCE Jurnal Inovasi Pendidikan Matematika Dan IPA*, *5*(1), 321. https://doi.org/10.51878/science.v5i1.4616

Siregar, A. (2020). Application of quantum teaching learning model as an effort to improve student learning outcomes. *JURNAL PAJAR (Pendidikan Dan Pengajaran)*, *4*(5), 994. https://doi.org/10.33578/pjr.v4i5.8134

Suhandri, et al. (2019). Effectiveness of the application of learning models collaborative problem solving against the ability to solve mathematical problems in middle school students. *Journal of Physics Conference Series*, *1315*(1), 12067. https://doi.org/10.1088/1742-6596/1315/1/012067

Tanjung, Y., et al. (2019). Influence of group guidance with discussion techniques on local learning interest. *KnE Social Sciences*. https://doi.org/10.18502/kss.v3i17.4662

Tilke, A. (2019, October 8). School library concepts developed by an inquiry-approach curriculum organization. *IASL Annual Conference Proceedings*. https://doi.org/10.29173/iasl7398

Ulfa, R., et al. (2021). Interactive instructional: Theoretical perspective and its potential support in stimulating students' higher order thinking skills (hots). *J-PEK (Jurnal Pembelajaran Kimia)*, *6*(1), 1. https://doi.org/10.17977/um026v6i12021p001

Waterworth, P. (2020). Creating joyful learning within a democratic classroom. *Journal Of Teaching And Learning In Elementary Education*, *3*(2), 109. https://doi.org/10.33578/jtlee.v3i2.7841