

The Impact of Hybrid Quantum Learning Methods on Arabic Language Acquisition Among Students of Islamic Boarding School in Indonesia

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ABSTRACT

The study explores Hybrid Quantum Learning in Arabic language education amid COVID-19, employing a quantitative approach with descriptive research methods. Data collection includes observation, interviews, tests, and questionnaires, analyzed through descriptive techniques and hypothesis testing. Experimental and control groups assess Hybrid Quantum-Classical Learning's efficacy, showing a 63.34% average difference in the former and 62.95% in the latter, indicating somewhat effective outcomes. Initially lacking, student engagement improved with model implementation. Further examination, supported by Likert scale responses, reveals an 87.33% satisfaction rate among students, highlighting the effectiveness of teaching auditory, visual, and kinesthetic skills in Arabic language education, particularly during the pandemic at Hasanka Islamic Boarding School in Indonesia.

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Introduction

The success of students in achieving learning outcomes varies among individuals, influenced by a combination of internal and external factors. Internal factors, such as intelligence, interest, and motivation, originate from within the students themselves, while external factors, including family environment, societal influences, available learning facilities, and socioeconomic conditions, stem from outside the students (Anggraini et al., 2021; Ao & Jamir, 2022; Audina & Mubarak, 2021; Batubara et al., 2020; Bower, 2019; Ferdiansyah et al., 2020; Finch et al., 2023; Nurfaidah et al., 2020; Octaberlina & Muslimin, 2020). Learning success manifests through students' achieved outcomes, signifying their effectiveness in fulfilling their roles as learners. Numerous factors, both internal and external, contribute to

learning outcomes, with the chosen learning model playing a significant role. This research adopts the Quantum Learning model.

Quantum Learning fosters an effective learning environment by utilizing elements present within students and their surroundings, promoting interaction within the classroom (Altın & Saracaloğlu, 2019; Khozaei et al., 2022; Nahar et al., 2022; Umamah et al., 2020). This approach, as described by DePorter and Hernacki, underscores the pivotal role of learning methods in enhancing performance across various domains (Hernacki, n.d.). Creating a pleasant learning atmosphere aims to enhance students' motivation and engagement. Quantum Learning facilitates relaxed learning experiences, emphasizing responsible growth, cooperation, fair competition, and active educational participation. This approach aligns with liberation learning principles, prioritizing student activity and self-exploration. The implementation of Hybrid Learning, combining face-to-face and online teaching methodologies, offers flexibility and engagement (Abbas et al., 2023; Al-Enzi et al., 2023; Alhusban, 2022; Forbes et al., 2023; Looi, 2022; Nortvig et al., 2018; Schneikart & Mayrhofer, 2022; Souabi et al., 2021; Tan et al., 2023), especially in the face of the COVID-19 pandemic. Hybrid Learning encourages interactive learning experiences, adaptable to various circumstances, thereby stimulating critical thinking skills.

Initial observations at Hasanka Islamic Boarding School in Indonesia revealed standard learning outcomes, albeit limited by reliance on WhatsApp for learning materials. Hybrid Learning emerges as a viable solution, offering diverse and practical educational resources beyond traditional methods. Amidst the COVID-19 pandemic, Hybrid Learning proves instrumental in maintaining educational continuity while fostering student interaction and feedback. The approach, aligned with the 2013 curriculum's focus on student activities, enhances critical thinking skills, essential for future distance learning scenarios.

The pandemic's impact extends beyond Indonesia's economic landscape, affecting global sectors, including education. Efforts by the Ministry of Education and Culture aim to sustain the education system through online learning, influencing students' learning outcomes in the COVID-19 era (Ahmadi & Ilmiani, 2020; Al-Marooof et al., 2020; Ferdiansyah et al., 2020; Nurfaidah et al., 2020; Octaberlina & Muslimin, 2020).

Given the outlined challenges, this research delves into the application of the Hybrid Quantum Learning model in Arabic language education. Combining Quantum Learning and Hybrid Learning principles, this approach integrates best practices for effective teaching and learning. Addressing these challenges, the authors aim to conduct comprehensive research on learning methodologies and their impact on Arabic language acquisition amidst the COVID-19 pandemic. The proposed research titled "The Impact of Hybrid Quantum Learning Methods

on Arabic Language Acquisition Among Students of Islamic Boarding School in Indonesia" seeks to contribute to this area of study.

Here are some previous studies relevant to this research. First, Ridwan Nur Banangji, improving corner learning outcomes in football subjects through the Quantum Learning model approach with cooperative settings for grade VI.3 students of Government Elementary School 3 in the first semester of the 2019/2020 academic year (2021). This research is an experimental research in the classroom (classroom action research) and aims to get an overview of the motivation, learning potential, and self-confidence of students and to find out an increase in PJOK learning outcomes in Grade VI.3 students after implementing Quantum Learning model with cooperative settings.

The results showed that the learning outcomes of PJOK students in the first cycle obtained an average score of 55.79 out of a maximum score of 100 with a standard deviation of 16.12. For the second cycle, the average score obtained was 71.97 out of the score. The maximum possible is 100 with a standard deviation of 10.97, while for the mastery level of 65% and above, there is an increase from 42.11% in the first cycle to 84.21% in the second cycle.

Second, Alan Hariyono and Agus Supriyono, the impact of Hybrid Learning in history subjects on students' critical thinking achievements at SMAN 1 LAMONGAN (2021). This study discusses whether there is an impact and the extent of the contribution of implementing Hybrid Learning in history subjects on students' critical thinking achievements at SMAN 1 Lamongan. This study aims to explain the impact and calculate the impact of implementing Hybrid Learning in history subjects on students' critical thinking achievement at SMAN 1 Lamongan. This study uses a quantitative approach to the single-shot case study design, which is analyzed through simple linear regression. The analysis tool used to obtain data from students' critical thinking abilities is a test. The test results are in the form of mean scores. After conducting the experiment, the results of the analysis of the tools used are obtained so that the relationship between the Hybrid Learning variable (X) and the critical thinking variable (Y) is known through testing the product moment correlation, two-party hypothesis testing, and comparing the calculated R-value $0.501 > R$ moment product table 0.329. The result is the relationship between the two variables. The positive Rcount value (+) falls in the area of accepting H_a , so H_o is rejected, and H_a is accepted. From the test results, it is known that the correlation coefficient value of 0.501 falls in the MEDIUM category, with a significance of $0.002 < 0.05$, meaning that the data has a large effect. The effect of variable X on Y is shown from the R-square in the summary table, which is 0.251. After processing the subsequent test results, it can be seen that six of the eight indicators have achieved good achievements. At the same time, the indicators that still do not meet the expectations of critical thinking achievement are source credibility assessment and making conclusions. Thus, it can be concluded that the

application of the Hybrid Learning model in history subjects has a positive effect in the MEDIUM category, so it can be said that the positive effect of applying Hybrid Learning on students' critical thinking achievement at SMAN 1 Lamongan is 25%.

Third, Heny Hendrayati & Budhi Pamungkas, implementing Hybrid Learning models in the learning process for the second semester statistics course in the FPEB UPI administrative study program (2013). This study aims to produce a hybrid educational model, which is an educational model that combines face-to-face methods with e-learning methods, as well as to measure the impact of applying the model on student achievement. A Hybrid Learning model was developed for the second semester statistics study in the UPI administrative study program. The research was conducted for 8 months with research stages that included model development, model testing, and model improvement based on the results of experiments. The results showed that the application of the Hybrid Learning method was not suitable for application to the quantitative courses that were more quantitative in nature. This can be observed from the lower student test scores compared to the traditional method. For quantitative workshops, it turned out that the physical presence of instructors is still strongly required.

Fourth, Ni Luh Putu Swandewi, I Nyoman Gita, and I Made Suarsana investigated the impact of problem-based Quantum Learning models on high school students' creative thinking skills (2019). This study aims to determine whether the mathematical creative thinking skills of students taught using problem-based Quantum Learning models are better than the mathematical creative thinking skills taught through traditional learning. The study community was students of the second semester MIPA class of SMA 2 Singaraja in the first semester of the 2018/2019 academic year. The research was classified as a quasi-experimental study with a post-test only control group design. Data collection about students' creative thinking skills was carried out through tests of students' mathematical creative thinking skills. Additionally, the analysis of creative thinking ability test scores was analyzed using a one-tailed t-test (right-tailed) at a significance level of 5%. The analysis results show that $t_{count} = 1.80295$ while the significance level of 5% $t_{table} = 1.66864$, so H_0 is rejected. This statistical value means that the mathematical creative thinking skills of students taught using problem-based Quantum Learning models are better than the creative thinking abilities of students taught through traditional learning. It can be concluded that the application of learning using problem-based Quantum Learning models provides a positive effect on students' mathematical creative thinking skills.

Fifth, Wiji Astutik, Quantum Learning Models to Improve Fraction Learning Outcomes (2017). This study aims to describe the application of the Quantum Learning model to fractional

subjects that can improve student learning activities and outcomes. The research subjects were 25 students. Based on the analysis results obtained, the learning outcomes for students who completed the first cycle were 14 students with a classic completion rate of 56%, which increased in the second cycle to 21 students with a classic completion rate of 84%.

Based on the results of this study, it can be concluded that the application of the Quantum Learning model to the fraction subject can improve student learning activities and outcomes in mathematics. However, there has not been any research focusing on the outcomes of applying the quantum learning model to Arabic language learning. Therefore, the results of this study offer novelty regarding Arabic language learning outcomes using the quantum learning model.

Method

Research Design

The research employs a quantitative approach to analyze data using numerical figures. Descriptive research method is utilized to systematically describe phenomena (Winarni, 2021). Variables include independent (learning methods) and dependent (learning outcomes). The population comprises 40 eleventh-grade students at Hasanka Islamic Boarding School in Indonesia, divided into two classes. A balanced stratified random sample of 40 students is selected for the study.

Data Collection Techniques

Data collection methods include observation, interviews with teachers and students, tests (written and non-written), and questionnaires. Observation involves direct monitoring of classroom activities. Interviews gather insights from teachers and students on grammar learning methods. Tests assess pre-test and post-test differences between experimental and control groups. Questionnaires evaluate the program's effectiveness from the students' perspective (Winarni, 2021).

Data Analysis Techniques

Data analysis is a systematic process involving efforts to identify features and formulate hypotheses based on data, with the aim of aiding subjects and hypotheses. This process also includes organizing data into descriptive methods and units to facilitate hypothesis formulation. The analysis involves several steps, including descriptive analysis that utilizes descriptive methods for each student from various departments at Hasanka Islamic Boarding School in Indonesia, focusing on learning outcomes in Arabic subjects. The methods include calculating averages and percentages, as well as conducting tests for normality and linearity. Additionally, hypothesis testing is performed, which includes the "t" test to understand the relationship between independent and dependent variables partially. Decision-making criteria are based

on the significance level α . Furthermore, there is also an "F" test aimed at determining the overall significant effect between independent and dependent variables. Decision-making criteria are based on the significance level α . This analysis aims to provide insights into the relationships and influences among variables in the research.

Result and Discussion

The primary issue students face during learning in the COVID-19 era, particularly, is their inability to connect what they learn with how this knowledge will be utilized. This is because the methods through which they acquire information and self-motivation have not been truly affected by the ways that could genuinely aid them. Students find it challenging to grasp the subjects taught because the teaching methods employed by teachers are limited to traditional methods, followed by assigning tasks through platforms like Google and WhatsApp. In this study, the researcher implemented a hybrid model for quantum learning.

When using the homogeneity test, which is used to determine whether the data in the two sets of classes have the same variance (homogeneous) or not, as well as to test the normality to know whether the required data is normally distributed or not. With the aforementioned test conditions, there are conditions that must be fulfilled in the parametric analysis, and one of them is the homogeneity test.

Based on the pre-test results in the control group and experimental group using SPSS 26 software, the homogeneity test results were homogeneous, as Sig. values = 0.118 > 0.05, hence it can be concluded that the variance in the data of the post-test for the experimental group and the post-test for the control group is not the same. While the significance value (Sig.) based on the mean is 0.027 < 0.05 in the control group and the experimental group, therefore it can be inferred that the variance of the post-test data for the experimental group and the subsequent test for the control group is the same or homogeneous. It can be concluded that one of the requirements (not absolute) for the independent sample t-test has been fulfilled.

After conducting the homogeneity test, the researcher proceeded with the normality test for the pre-test results in the control group and the experimental group, with a significance value (Sig) for all data on the Monte Carlo test > 0.05, hence it can be inferred that the research data is normally distributed. At the same time, for the post-test results in the control group and the experimental group, the significance value (Sig) for all data in the Monte Carlo test > 0.05, thus it can be inferred that the research data is normally distributed.

Then, after knowing the results of the homogeneity test and the normality test, the researcher conducted independent sample tests for the control group and the experimental group. This test is used to compare the degree not associated with both groups. In this case, the researcher found a moderate difference for the pre-test between the control group and the

experimental group, with the average score of the experimental group (63.33) being higher than the average score of the control group for the pre-test (63). Additionally, the average score of the post-test for the experimental group (85) is higher than the average score of the post-test for the control group (74.50).

Judging by the difference between the means, in the preliminary test between the control group and the experimental group, there is no significant difference between the two because the difference in results between the means is very small. For this result, refer to the sig value (2-tailed) in the independent t-test, which has a value of $0.865 > 0.05$, and it can be concluded that there is no significant difference between the pre-test in the control group and the experimental group. Based on this analysis using homogeneity and normality analysis that was conducted. Therefore, the researcher conducted an independent t-test to determine the difference in results between the two unrelated groups. As for the results of the analysis, there is no significant difference between them, because the difference in results between the two means is very small.

At the same time, for the post-test of the control group and the experimental group, a significant difference was found between the means because the difference in results between the means was relatively large. For this result, refer to the sig value (2-tailed) which has a value of $0.000 > 0.05$, and it can be concluded that there is no significant difference between the post-test in the control group and the experimental group. Based on this analysis using homogeneity and normality analysis that was conducted. Therefore, the researcher conducted an independent t-test to determine the difference in results between the two unrelated groups. As for the results of the analysis, there is a significant difference between them, because the difference in results between the two tariffs is relatively large.

To apply Hybrid Quantum-Classical Learning to Arabic language education during the COVID-19 pandemic among students of Hasanka Islamic Boarding School in Indonesia, it has been effective in students' skills and outcomes. Students write down and repeat the words that have been represented. Students do not easily feel bored in the teaching and learning process because student activities play a role that makes learning or the teaching and learning process enjoyable. Quantum Learning aims for students who have now become more receptive to learning and more independent with their learning methods with their own learning comfort as well.

This was also described in a descriptive statistical test in applying Hybrid Quantum-Classical Learning to Arabic language education during the COVID-19 pandemic era among students of Hasanka Islamic Boarding School in Indonesia. By calculating the difference in the mean value between the two groups with subsequent test results or to determine whether students are able to use multiple quantitative learning methods. Therefore, students are seen

as capable of using the Quantum Learning method by looking at the visual, auditory, and kinesthetic learning that students receive well and also begin to develop well.

The average difference in the experimental group or Class A is 63.34%, meaning that the learning outcomes for the experimental group through Hybrid Quantum-Classical Learning in Arabic language education during the COVID-19 pandemic era among students of Hasanka Islamic Boarding School in Indonesia are somewhat effective. At a minimum of 50% and a maximum value of 70%. The control group achieved an average score of 62.95%, meaning that the control group does not apply Hybrid Quantum-Classical Learning in Arabic language education during the COVID-19 pandemic era among students of Hasanka Islamic Boarding School in Indonesia with a somewhat effective rating.

Student activities in Quantum Learning initially met the desired expectations because there were still many students who were busy talking to their friends, and some of them were silent and played with cards. Additionally, when identifying problems, students were still confused about the presentations conducted by the teacher. When presenting unclear things and expressing their opinions or responding to the teacher's explanations and questions, some students were silent and lacked the courage to ask or respond. During the discussion of tasks and presenting group results, only some students were active. Students are also not accustomed to concluding the materials so that they are still confused at the end.

To overcome this problem, students need to be trained again to be active in learning so that they are more confident in working on individual questions, and most importantly when expressing opinions and presenting work results in front of the class. However, after administering Quantum Learning treatment, student activities increased, and this can happen because the Quantum Learning model applied to students is progressing as expected. Therefore, it can be said that learning using the Quantum Learning model is capable of improving student learning outcomes.

It is known that the average difference for the experimental group is 63.34% with effective estimation, and the average difference in the control group is 62.96% with effective estimation as well. Based on the difference results, the researcher noted the points of the above analysis. These data are reinforced through the results of the questionnaire distributed by the researcher to the students and analyzed by the researcher using Likert scale. Based on the previous calculation, the researcher obtained the result data or a value of 87.33%. If it fits the Likert scale, the results are from the surrounding standard and the estimates are very good. The percentage of 76%-100% indicates that teaching auditory, visual, and kinesthetic skills in Arabic language education during the COVID-19 pandemic era among students of Hasanka Islamic Boarding School in Indonesia.

This research is in line with the research by Wiji Astutik where Quantum Learning can improve student learning activities and outcomes (Astuti, 2017). This result is attributed to the use of learning methods used by students capable of solving problems related to the materials being taught in depth. Based on the data obtained, it appears that there is an increase in student learning outcomes, both at the individual or class level (Nahar et al., 2022; Umamah et al., 2020). Thus, learning using the Quantum Learning model was successful in improving student learning outcomes.

Conclusion

The study concludes that implementing Hybrid Quantum-Classical Learning in Arabic language education during the COVID-19 pandemic era among students of Hasanka Islamic Boarding School in Indonesia yielded promising results. The approach involved several steps, including initiating classes with a prayer, providing students with information on Quantum Learning, encouraging active engagement with course materials, posing questions to stimulate participation, and evaluating each session to enhance subsequent ones. Results indicate that the Hybrid Quantum Learning methods were effective, leading to improved learning outcomes compared to traditional methods. Statistical analysis revealed a significant increase in learning outcomes in the experimental group, with an average difference of 63.64%, while the control group showed an average difference of 62.95%. These findings were reinforced by questionnaire results, which showed a high level of student engagement and satisfaction.

Based on these conclusions, the study recommends that schools adopt Hybrid Quantum Learning methods for Arabic language education during the pandemic period. Furthermore, it suggests that teachers can benefit from additional resources and media to support this approach effectively. In light of the study's success, it is suggested that educators, particularly those teaching high school students, consider integrating Hybrid Quantum Learning into their teaching practices, thereby enhancing student engagement and learning outcomes in challenging circumstances.

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