The Effectiveness of Blended Learning in Improving Students' Self-Regulated Learning
in Islamic Religious Education Subjects

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Efektivitas Blended Learning dalam Meningkatkan Self-Regulated Learning Siswa Pada Pelajaran Pendidikan Agama Islam

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Abstract

In the Industrial Revolution 4.0 era, leveraging technology in education is crucial. The blended learning model can influence self-regulated learning (SRL), which entails individuals' ability to understand and control their learning environment, fostering independence and responsibility. This study, employing a mixed-methods design and a pre-experimental design for the quantitative phase, aimed to examine the impact of blended learning on SRL. Data were collected via questionnaires and analyzed with paired sample t-tests. The results showed as follows: (1) The descriptive analysis of the SRL pre-test of students indicates that the highest percentage was in the medium category with 85% students; (2) the results of the SRL post-test proved that the highest percentage is in the low category with 63% students; and (3) the results of the paired sample t-test showed the value of sig. (2-trailed) < alpha (0.007 < 0.05). The statistical analysis confirmed a significant difference between pre-test and post-test scores, suggesting that the blended learning model was ineffective in enhancing SRL among students in Islamic Education at SMKN 7 Majene. Observations and interviews revealed that students' lack of self-regulated learning was due to inadequate technological resources and challenges in using Google Classroom, which was a novel experience for students and hindered their ability to access materials and submit assignments.

Keywords: *Blended Learning, Self-Regulated Learning, Islamic Education, Vocational School*

Abstrak

Di era Revolusi Industri 4.0, pemanfaatan teknologi dalam dunia pendidikan sangatlah penting. Model pembelajaran blended learning dapat mempengaruhi self-regulated learning (SRL), yaitu kemampuan individu untuk memahami dan mengontrol lingkungan belajar mereka, menumbuhkan kemandirian dan

tanggung jawab. Penelitian ini, menggunakan desain metode campuran (kuantitatif dan kualitatif) dan desain pra-eksperimental untuk fase kuantitatif, bertujuan untuk menguji dampak *blended learning* terhadap SRL. Data dikumpulkan melalui kuesioner dan dianalisis dengan uji t sampel berpasangan. Hasil penelitian menunjukkan bahwa: (1) Analisis deskriptif *pre-test* SRL peserta didik, persentase paling banyak berada pada kategori sedang yaitu 85%. (2) Hasil analisis deskriptif *post-test* SLR peserta didik, persentase paling banyak berada pada kategori rendah yakni 63%. (3) Hasil uji *paired sample t-test* menunjukkan nilai sig. (*2-trailed*) < Alpha (0.007 > 0.05). Analisis statistik mengkonfirmasi adanya perbedaan signifikan antara skor *pre-test* dan *post-test*, yang menunjukkan bahwa model *blended learning* tidak efektif dalam meningkatkan SRL siswa dalam mata pelajaran Pendidikan Agama Islam di SMKN 7 Majene. Observasi dan wawancara mengungkapkan bahwa kurangnya SRL pada siswa disebabkan oleh keterbatasan sumber daya teknologi dan tantangan dalam menggunakan *Google Classroom*, yang merupakan pengalaman baru bagi siswa dan menghambat kemampuan mereka untuk mengakses materi dan mengumpulkan tugas.

Kata kunci: Pembelajaran Campuran, Pembelajaran Mandiri, Pendidikan Islam, Sekolah Kejuruan

A. Introduction

Self-regulated learning (SRL) is a process that requires individuals to determine their own learning needs and choose appropriate learning strategies. Self-regulated learning (SRL) is a framework that enables learners to independently direct their educational journeys. First introduced by Zimmerman in 1990, SRL consists of three key phases: forethought, performance, and self-reflection.[1] The first phase, forethought, involves learners analyzing the task, setting goals, and developing strategies while adjusting their motivation to complete the task. In the performance phase, learners actively engage in activities, continuously monitoring and adjusting their behaviors to meet their goals. The final phase, self-reflection, requires learners to review and evaluate their effectiveness and outcomes, gaining insights and knowledge from their experiences.[2] SRL is the behavior of someone who can take the initiative, overcome problems, have self-confidence, and can do something without the help of others.[3] Several studies

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[1] Barry Zimmerman, 'Goal Setting and Self-Efficacy During Self-Regulated Learning', *Educational Psychologist* 25, no. 1 (1990): 3–17, https://doi.org/10.1207/s15326985ep2501.

[2] Barry J. Zimmerman, 'Investigating Self-Regulation and Motivation: Historical Background, Methodological Developments, and Future Prospects', *American Educational Research Journal* 45, no. 1 (2008): 166–83, https://doi.org/10.3102/0002831207312909.

[3] Dede Rahmat Hidayat, et al. "Kemandirian belajar peserta didik dalam pembelajaran daring pada masa pandemi COVID-19." *Perspektif Ilmu Pendidikan* 34 no.2 (2020): 147-154.

are revealing that self-regulated learning enhances academic performance. A meta-analysis conducted by Renée et al. proved that self-regulated learning intervention successfully improves academic achievement in higher education students.[4] Even though research on self-regulated learning (SRL) affects academic performance in online education has grown, the findings are inconsistent. Some showed a small positive correlation between overall SRL strategies and online academic performance.[5]

Education in the era of the Industrial Revolution 4.0 is faced with more complex challenges, every individual is required to be able to keep up with the times. In reality, the use of technology in learning has not yet been implemented optimally in Indonesia.[6] Research on technology in learning is still scarce, particularly in underdeveloped provinces such as West Sulawesi.

Islamic Education (PAI) teaching at SMK Negeri 7 Majene reflects a traditional approach in several key aspects. Teachers predominantly rely on textbooks for information and conduct teacher-centered classes where students passively receive information. There is limited integration of technology or multimedia tools to enhance learning experiences, and teaching strategies typically do not accommodate diverse learning styles, interactive discussions, and independence. The approach tends to use the traditional model which suggests opportunities for innovation and the adoption of more engaging, inclusive teaching methods to better meet the needs of modern students and enhance their initiative, proactivity, and engagement in Islamic education.

One learning model that can be used is using a blended learning model.[7] The choice of this learning model is based on SRL abilities which can be improved if the learning environment is supportive. The blended learning model can provide several benefits, where students can easily access learning materials, reduce educational costs, and improve the quality of learning. The application of blended learning in learning can certainly make it easier for

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[4]Renée S. Jansen et al., 'Self-Regulated Learning Partially Mediates the Effect of Self-Regulated Learning Interventions on Achievement in Higher Education: A Meta-Analysis', *Educational Research Review* 28 (2019): 100292, https://doi.org/10.1016/j.edurev.2019.100292.

[5] Cheng, Z., Zhang, Z., Xu, Q. et al. "A meta-analysis addressing the relationship between self-regulated learning strategies and academic performance in online higher education,"*Comput High Educ* (2023). https://doi.org/10.1007/s12528-023-09390-1

[6] Erwin Sawitri, Made Sumiati Astiti, and Yessi Fitriani, 'Hambatan Dan Tantangan Pembelajaran Berbasis Teknologi Informasi Dan Komunikasi', *Prosiding Seminar Nasional Pendidikan Program Pascasarjana Universitas PGRI Palembang*, 2019, 202–13, https://doi.org/978-602-52451-3-8."Hambatan dan tantangan pembelajaran berbasis teknologi informasi dan komunikasi." *Prosiding Seminar Nasional Program Pascasarjana Universitas Pgri Palembang*. (2019), 202-2013.

[7]Handoko Waskito, *Blended Learning: Konsep Dan Penerapannya*, *Blended Learning: Konsep Dan Penerapannya*, Cet. I, vol. 5 (Padang: (LPTIK) Universitas Andalas, 2018), https://doi.org/10.25077/car.64.60.

educators to provide material, assignments/quizzes just by using a smartphone. In this way, students will find it easier to access lessons anytime and anywhere or in this case, they can organize and control their learning activities.[8]

The blended learning model is learning that was developed from an online learning model with a face-to-face learning model, which involves certain media in achieving learning goals.[9] The Blended learning model is a blend or combination of various learning both online and offline.[10] The blended learning method has been researched several times with quite positive results, so this method can be used by teachers in learning systems by taking advantage of technological advances.[11] According to research by Ruchan and Adem, blended instruction is more effective than traditional instruction for developing self-regulated learning. A blended learning environment provides rich content, easy accessibility, effective guidance, and motivation.[12] A study also found that the blended learning environment positively influences students' attitudes toward SRL due to factors like perceived teacher support and major satisfaction, which enhance their intention to engage in SRL activities.[13]

In the Indonesian context, firstly, based on research conducted by Tsuwaybah, Punaji, and Henry, that the blended learning model has proven positive in increasing six indicators of student learning independence.[14] The second research on the design and development of learning models based on the Blended Learning model carried out by Erina Wulansari, with the help of Google Classroom, showed similar results, namely positive and effective results.[15]

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[8]Purwati Zisca Diana et al., 'BLENDED LEARNING DALAM PEMBENTUKAN KEMANDIRIAN BELAJAR', 2020.

[9]Teguh Widiyanto, "Peningkatan keaktifan dan hasil belajar kompetensi dasar pembentukan logam dengan blended learning berbantuan media sosial schoology di kelas X TKRD SMK Negeri 2 Surakarta." *Jurnal Nosel* 4. no.1 (2015).

[10]Waskito, *Blended Learning: Konsep Dan Penerapannya*.6.

[11]Syu'aibul Huda David Rizaldy, Kristi Dese Imanuel Adi Papa Yohanes, 'Metode Pembelajaran Blended Learning Sebagai Solusi Dalam Menghadapi Reposisi Pendidikan Di Era Revolusi Industri 4.0', *Prosiding Seminar Nasional Pendidikan Sains Dan Teknologi*, 2018, 270–76.

[12]Ruchan Uz and Adem Uzun, 'The Influence of Blended Learning Environment on Self-Regulated and Self-Directed Learning Skills of Learners', *European Journal of Educational Research* 7, no. 4 (2018): 877–86, https://doi.org/10.12973/eu-jer.7.4.877.

[13]Yujun Jiang et al., 'Students' Intention toward Self-Regulated Learning under Blended Learning Setting: PLS-SEM Approach', *Sustainability (Switzerland)* 14, no. 16 (2022), https://doi.org/10.3390/su141610140.

[14]Tsuwaybah Al Aslamiyah et al. "Blended Learning dan Kemandirian Belajar Mahapeserta didik Teknologi Pendidikan", *Jurnal Kajian Teknologi Pendidikan* 2 no.2 (2019), 109–14 <https://doi.org/e-ISSN 2615-8787>

[15]ERINA WULANSARI, 'PENGEMBANGAN PERANGKAT PEMBELAJARAN BERBASIS MODEL PEMBELAJARAN BLENDED LEARNING DENGAN MEMANFAATKAN GOOGLE

Based on several studies above, it shows that research on the blended learning model has been studied by several previous researchers. However, in the Indonesian context, this research mostly uses independent learning variables which are different from self-regulated learning. One of the studies that links blended learning with self-regulated learning is research conducted by Wahyu Setyaningrum which revealed that there is a significant difference in self-regulated learning between students in blended classes and those in traditional offline classes. This study provides insights into how blended learning can enhance students' self-regulated learning, particularly in mathematics.[16] There has been no research that discusses the use of the blended learning model to improve self-regulated learning in Islamic Religious Education subjects.

In addition, most research on self-regulation learning in blended learning environments is conducted in higher education. There is limited information on how this is implemented at the senior high school level, especially in Eastern Indonesia, specifically in West Sulawesi. Therefore, this research discusses and examines the effectiveness of the blended learning model in Improving Self-Regulated Learning (SRL) of Students in Islamic Religious Education (PAI) Subjects in State Vocational Schools (SMKN) 7 Majene. SMKN 7 Majene was chosen based on initial observations by researchers, which revealed that educators predominantly use conventional methods for PAI learning, and there is minimal use of smartphones for educational purposes. Instead, students primarily use their smartphones for playing games and social media. Moreover, SMKN 7 Majene provides a Computer Network Engineering (TKJ) study program, which might be appropriate for the implementation of blended learning.

B. Method

This research uses a mixed-method design that combines quantitative and qualitative approaches. The quantitative design uses experiments. Experimental research is a research method used to find the effect of certain treatments on others under controlled conditions.[17] The experimental method in the research was used to measure the effectiveness of the blended learning model for self-regulated learning under controlled conditions.

CLASSROOM PADA MATERI VEKTOR DALAM RUANG DIMENSI TIGA DI KELAS X MIA 4 SMA NEGERI 7 YOGYAKARTA' (UNIVERSITAS SANATA DHARMA YOGYAKARTA, 2018)..

[16] Wahyu Setyaningrum, 'Self-Regulated Learning in Blended Learning Approach', *Journal of Physics*, 2019, 1–6, https://doi.org/10.1088/1742-6596/1320/1/012089.

[17] Wina Sanjaya, *Penelitian Pendidikan: Jenis, Metode Dan Prosedur*, Ed. I, Cet (Jakarta: Kencana, 2015).

The form of experimental design used in this research is pre-experiment design (non-designs). Pre-Experiment Design is experimental research carried out without any control variables and class selection is not done randomly.[18] The form of research used is a one-group pre-test and post-test design. In this design, two measurements were carried out, namely measurements before treatment in Islamic Religious Education subjects and measurements carried out after treatment using a blended learning model in Islamic Religious Education subjects in one class without using a comparison class. The treatment had been conducted for a month.

Self-regulated learning data collection uses the Self-Regulated Learning instrument developed by I Nyoman Mei Adi Shantiyana[19], with four answer statement options. The four answer options consist of always (SL), sometimes (KK), rarely (JR), and never (TP). The scale includes favorable and unfavorable statements. The aspects for the self-regulated learning questionnaire and scoring on the alternative answer scale used are as follows:

Table 1. The aspects of the Self-Regulated Learning Questionnaire

| No | Observed Aspects | Items | |
		Favorable	Unfavorable
1	Initiative in learning	5, 11, 8	16
2	Responsibility in learning	4, 12, 9	17
3	Ability to do self-control	6, 10	19
4	Confidence in learning	2, 14	20
5	Non-dependence on other people	1, 15	18, 7
6	Ability to maintain self-disciplined	3, 13	

Table 2. Scoring on the alternative answer scale

| Statements (Items) | Scoring | | | |
	SL	KK	JR	TP
Favorable Statements	4	3	2	1
Unfavorable Statements	1	2	3	4

The sample in this study was class XI TKJ 2, totaling 27 students. After the data is collected, it is analyzed using descriptive analysis, to find out a description of each variable and inferential statistics using hypothesis testing. In the descriptive statistics, the data were categorized based on the interval class calculation formula.[20]

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[18] Sugiyono, *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, Dan R&D* (Bandung: Alfabeta, 2008).

[19]I Nyoman Mei Adi Shantiyana, 'Pengaruh Content Knowledge (CK), Pedagogical Content Knowledge (PCK), dan Self-Regulated Learning (SRL) Siswa terhadap Hasil Belajar Matematika Siswa'. Doctoral dissertation, Universitas Pendidikan Ganesha, 2019.

[20] Sugiyono, Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D (Bandung: Alfabeta, 2008).

The data analysis of pre-test and post-test results involves conducting a normality test to meet the testing requirements. A paired sample t-test was used to determine if there were changes in students' self-regulated learning (SRL) attitudes in PAI subjects at SMK Negeri 7 Majene after implementing the blended learning model. The research hypothesizes that there is a difference in self-regulated learning before and after the intervention, with an expected increase in SRL results following the treatment.

C. Result and Discussion

The research results in the form of self-regulated learning results of class XI TKJ 2 students at SMK Negeri 7 Majene before using the blended learning model in Islamic Religious Education subjects, can be seen in the following table:

Table 3. Pre-test results of self-regulated learning at SMK Negeri 7 Majene

No	Score	Total
1	Highest	52
2	Lowest	41
3	Average	47.30
4	Standard Deviation	3.086

Based on the pre-test results above, the lowest score was 41, the highest score was 52, with an average of 47.30, and a standard deviation of 3,086, from a total sample (n) = 27 in the pre-test results.

The following is an illustration of the frequency distribution of the results of the SLR pre-test using a bar chart.
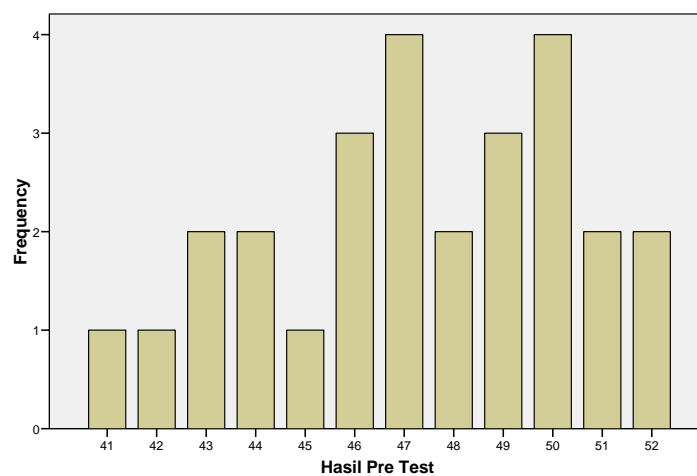

Figure 1. Frequency Distribution Bar Diagram of Pre-Test Results

The data that has been obtained from the results of the distribution table above shows that when compared with the average value of the results of students' self-regulated learning research, it shows that there were 14 respondents (51.9%) who were below the average value, who were in the above average group. The average was 13 respondents (48.1%). The variable histogram can be seen in the following variables.
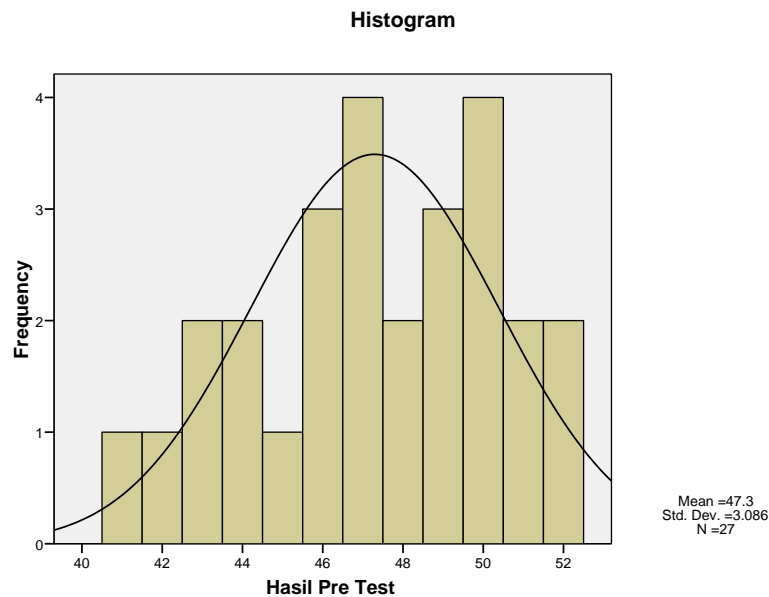

Figure 2. Histogram of Self-Regulated Learning Pre-Test Results

The categorization of self-regulated learning results can be seen in the following table:

Table 4. Categorization of self-regulated learning data before applying the model

Interval	Categories	*Fi*	%
68-80	Very High	0	0
56-67	High	0	0
44-55	Medium	23	85
32-43	Low	4	15
20-31	Very Low	0	0
Total		27	100%

Based on the results of the descriptive analysis, taking into account the 27 students as samples, 23 people, or 85% of respondents were in the medium category, and 4 people, or 15% of respondents were in the low category. This illustrates that self-regulated learning based on percentage is mostly in the medium category, namely 85%.

Furthermore, the score data obtained in the results of research on self-regulated learning of students at SMK Negeri 7 Majene class XI TKJ 2 after implementing the blended learning model in Islamic Religious Education subjects, can be seen in the following table:

Table 5. Post-test results of self-regulated learning at SMK Negeri 7 Majene

No	Score	Total
1	Highest	54
2	Lowest	35
3	Average	44.41
4	Standard Deviation	4.798

Based on the post-test results above, the lowest score was 35, the highest score was 54, with an average of 44.4, and a standard deviation of 4,798 from a total sample (n) = 27. The following is an illustration of the frequency distribution of the results of the post-test self-regulated learning using a bar chart.
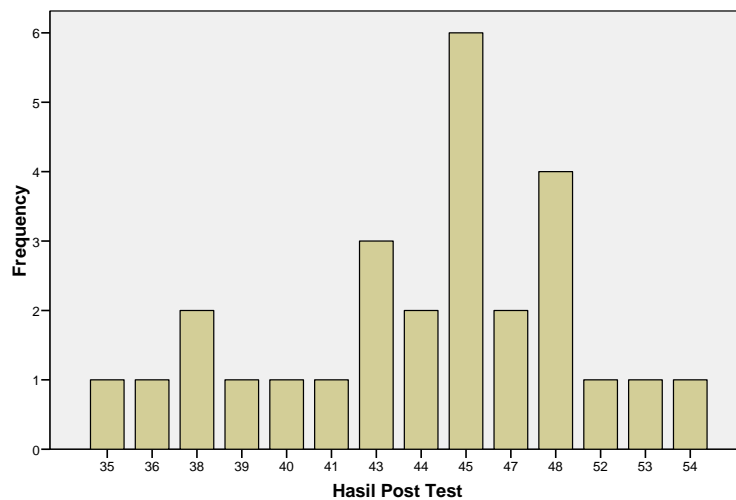

Figure 3. Frequency distribution of self-regulated learning post-test results

The data that has been obtained from the results of the distribution table above shows that when compared with the average value of the post-test self-regulated learning results of students, it shows that there are 12 respondents (44.4%) who are below the average value, which is at the group above the average was 15 respondents (55.6%). The variable histogram can be seen in the following variables.

Histogram

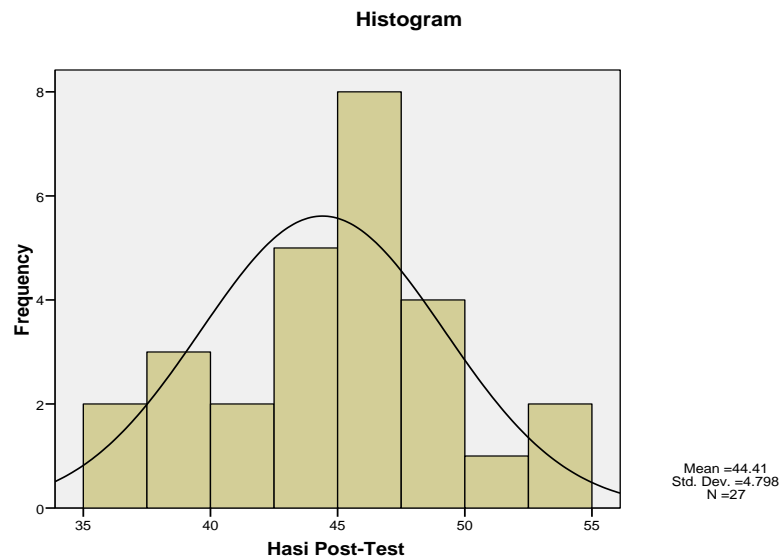Mean =44.41
Std. Dev. =4.798
N =27

Frequency

Hasi Post-Test

Figure 4. Histogram of self-regulated learning pre-test results

The categorization of self-regulated learning results can be seen in the following table:

Table 6. Categorization of self-regulated learning data after applying the model

Interval	Categories	*Fi*	%
68-80	Very High	0	0
56-67	High	0	0
44-55	Medium	17	63
32-43	Low	10	37
20-31	Very Low	0	0
Total		27	100%

Based on the results of the descriptive analysis, taking into account 27 students as a sample, 17 students, or 63% of respondents were in the medium category, and 10 students, or 37% of respondents were in the low category. This illustrates that self-regulated learning based on percentage is mostly in the medium category, with 63%.

Based on the results of the description of the tabulation of pre-test and post-test data above, the results show as follows:

Table 7. Categorization of self-regulated learning data before and after
applying the model

Interval	Categories	Pre-Test (%)	Post-Test (%)
68-80	Very High	0	0
56-67	High	0	0
44-55	Medium	85	63
32-43	Low	15	37
20-31	Very Low	0	0

The data indicates that there are differences in self-regulated learning between the pre-test and post-test results after implementing the blended learning model, with a general decline in scores. These findings are consistent with the paired sample t-test results. A mean difference test revealed a significant value of 0.007, which is higher than the 0.05 threshold, indicating a significant difference in self-regulated learning before and after the blended learning model was implemented. Nevertheless, while there is a change in students' self-regulated learning, the post-test scores are lower than the pre-test scores. Consequently, H1 is rejected, suggesting that the blended learning model is not effectively applied to class XI TKJ 2 students at SMK Negeri 7 Majene.

The unexpected outcomes prompt us to conduct a follow-up qualitative study to comprehend the underlying reasons. Observations made during the learning process indicate that students often struggle when a blended learning model is implemented. These challenges stem from inadequate facilities, particularly insufficient internet access. In an interview, a student from class XI TKJ 2 disclosed that: *"We have some difficulty submitting assignments because we don't have any internet data. The Wi-Fi at school is also limited, we don't know the password, and it's sometimes slow."*

The explanation above highlights that internet connectivity is a significant obstacle for students learning through the blended learning model. Observations during the research revealed that the school's Wi-Fi facilities are limited, do not reach all classrooms, and lack sufficient capacity. Consequently, the blended learning model is not functioning effectively, as its success heavily relies on robust internet connections and ICT resources.

Research by Alisa identifies several obstacles encountered in implementing the blended learning model. These include limited teaching time despite a substantial amount of material to cover, poor network connections, and a lack of motivation. Additionally, some teachers struggle with technological literacy and cannot effectively use technology in their teaching. Furthermore, students often lack motivation and enthusiasm for learning.[21] Rully Amrizal encountered similar challenges in his research, with the most significant obstacle being an unstable internet connection. A reliable internet connection is crucial for the success of blended learning. If the connection is unstable or unreliable, whether at school or home, online learning cannot be effective.[22] Consistent with this explanation, the implementation of the blended learning model at SMK Negeri 7 Majene is facing significant challenges. Students are equipped with gadgets, yet the school's and some students' home internet connections are inadequate. This is evident from the limited number of students participating in Google Classroom.

Figure 5. Class of XI TKJ 2

The illustration above indicates that out of 27 students in the group, only 22 participated, while the remaining 5 admitted they did not have gadgets. Consequently, some students struggle to access assignments and learning materials due to the limited facilities and infrastructure available to support their learning. In an interview, one student was asked about managing learning activities at home and responded that:

"Sometimes I study, but not often. Because there's no internet connection at my home. There's still no network in my village; I have to go out to get a connection.

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[21]Alisa Qotrunnada Amalia Amanto and Nur Khasanah, 'Blended Learning: Solusi Model Pembelajaran Dimasa Pandemi Covid-19', *Indonesia Journal of Islamic Elementary Education* 1, no. 1 (2021): 1–14, https://doi.org/ISSN 2797-3840.

[22] Rully Amrizal, 'IMPLEMENTASI PEMBELAJARAN BERBASIS BLENDED PADA MATA PELAJARAN MATEMATIKA KELAS VIII MTs SKRIPSI' (UNIVERSITAS NEGERI SEMARANG, 2016).

Even at school, there's no data. But I can usually access it if there's Wi-Fi available."

From the preceding explanation, it becomes evident that the implementation of the blended learning model faces various obstacles. Should schools or students encounter these hindrances, the blended learning model will not be effective when implemented. This resonates with the findings of this study, where students' Self-Regulated Learning (SRL) exhibited a decline or disparity following the implementation of the blended learning model. Through both observations and interviews, it became apparent that this decrease in SRL was attributable to inadequate ICT facilities and infrastructure supporting the chosen blended learning model. In interviews conducted with students regarding their reliance on peers or teachers while studying and completing assignments in Islamic Religious Education, one student disclosed: *"I always work on assignments by myself, but it's a bit difficult to submit them to the classroom, so I can't submit them on time."*

The explanation above shows that some students can do the assignments they are given on their own, but still have difficulty sending assignments to the classroom. As the results of observations made, during the learning process students were unable to understand how to send assignments, so many students were late and unable to send assignments to the group classroom. As seen in the following picture:

Figure 6. Assignments in class XI TKJ 2

The picture above shows that of the 27 students for the first assignment, only 15 students sent assignments, then for the second assignment there were only 11 students who sent assignments. Therefore,

from this picture, it can be seen that students' self-regulated learning is still lacking. As a result of observations made during the learning process, students tend to lack initiative in carrying out assignments no students submit assignments on time.

From the description provided, it can be inferred that the integration of the blended learning approach in class XI TKJ 2 faced challenges. Consequently, the students' self-regulated learning did not exhibit enhancement post-implementation; instead, it showed a tendency to decline.

Similar findings were uncovered in research conducted by Putri Fitriasari et al. Their study revealed that the test for the variance in mean increases in the learning process yielded a significant value of 0.094, surpassing the significance level of 0.05. Consequently, the null hypothesis is accepted, indicating that the improvement in learning independence among students receiving blended learning is not superior to those receiving conventional learning.[23] Based on this research, it shows that the blended learning model in several studies did not have a significant effect.

However, in many other studies, the blended learning model showed positive results after being implemented, particularly when implemented in higher education settings, such as in chemistry courses[24], mathematics courses[25,26] and Islamic macroeconomics courses.[27] For instance, one study concluded that this blended learning approach positively affected chemistry students' self-regulated learning and outcomes, notably enhancing critical thinking and problem-solving skills.[28] In addition, a study published in the Educational Technology Journal introduced a guidance-based ChatGPT-assisted learning aid (GCLA) aimed at enhancing self-regulated learning in

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[23]Putri Fitriasari, Tanzimah, and Novita Sari, 'Kemandirian Belajar Mahasiswa Melalui Blended Learning Pada Mata Kuliah Metode Numerik [Students' Self-Regulated Learning through Blended Learning in Numerical Methods Course]', *Jurnal Elemen* 4, no. 1 (2018): 1–8. Putri Fitriasari and Novita Sari, 'KEMANDIRIAN BELAJAR MAHASISWA MELALUI BLENDED LEARNING PADA MATA KULIAH METODE NUMERIK' 4, no. 1 (2018): 1–8.

[24] Lisa Pohan and Julia Maulina, 'Blended Learning Integrated with Project-Based Learning: Its Effect on Learning Outcomes, Perception, and Self-Regulated Learning', *Jurnal Pendidikan Kimia Indonesia* 6, no. 2 (2022): 97–106, https://doi.org/10.23887/jpki.v6i2.48213.

[25] Setyaningrum, 'Self-Regulated Learning in Blended Learning Approach'.

[26] Indah Riezky Pratiwi, 'Efektifitas Blended Learning Melalui Lms Moodle Untuk Meningkatkan Kemandirian Belajar Mahasiswa Pada Mata Kuliah Matematika Di Politeknik [the Effectiveness of Blended Learning Using the Moodle Lms To Improve Polytechnic Students' Self-Regulated Learning in Mathematics Courses]', *JOHME: Journal of Holistic Mathematics Education* 6, no. 1 (2022): 29, https://doi.org/10.19166/johme.v6i1.5217.

[27]Neng Kamarni and Hadi Rahadian, 'Blended Learning in Improving Self-Regulated Learning and Student Quality in Islamic Microeconomic Course', *Proceedings of the 3rd International Conference on Educational Development and Quality Assurance (ICED-QA 2020)* 506 (2021): 550–56, https://doi.org/10.2991/assehr.k.210202.095.

[28] Pohan and Maulina, 'Blended Learning Integrated with Project-Based Learning: Its Effect on Learning Outcomes, Perception, and Self-Regulated Learning'.

blended learning environments in higher education. The findings indicated that the GCLA significantly improved students' self-regulated learning, especially in goal-setting and strategy development. Collectively, these studies illustrate the positive impact of blended learning on self-regulated learning, showcasing its potential to improve student learning outcomes and academic performance across various educational settings.[29]

Given the preceding finding, one can infer that the blended learning approach has the potential to enhance self-regulated learning, especially when the learning environment is conducive. Although findings are consistently positive in higher education settings, it is important to consider results from secondary education, especially in less conducive environments like our current research, which does not align with the majority of previous studies. This includes factors like the presence of sufficient internet infrastructure in schools, complemented by access to devices and internet connectivity at home. It is important to highlight that student readiness plays a crucial role in the successful implementation of blended learning. This readiness might be influenced by both the socioeconomic backgrounds of students and the school's capacity to offer emotional support and resources that enhance self-regulated learning within a blended learning setting.

D. Conclusion

Upon data analysis, it is evident that the experiments conducted on students' self-regulated learning exhibited variances post-implementation. Surprisingly, these variances decreased with the introduction of the blended learning model. It is also indicated by observation and interview outcomes. Observations highlighted that students' insufficient self-regulated learning stemmed from inadequate technological resources, limiting their autonomy in independent learning activities. Interviews further revealed that the utilization of the blended learning model, specifically through Google Classroom, posed challenges for students in accessing materials and submitting assignments. Given that the use of Google Classroom was a novel experience for students, they encountered difficulties in adapting to this new learning approach. Therefore, it can be concluded that the blended learning setting at SMKN 7 Majene cannot increase the students' self-regulated learning in Islamic religious education subjects due to several limitations.

The limitation of the author in this study lies in the inadequate consideration given to the selection of research locations, which were found

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[29] Hsin Yu Lee et al., 'Empowering ChatGPT with Guidance Mechanism in Blended Learning: Effect of Self-Regulated Learning, Higher-Order Thinking Skills, and Knowledge Construction', *International Journal of Educational Technology in Higher Education* 21, no. 1 (2024), https://doi.org/10.1186/s41239-024-00447-4.

to be ill-prepared for implementing the blended learning model. Throughout the experimental process, time was suboptimally utilized due to prolonged periods spent resolving technical issues, such as navigating Google Classroom. However, future researchers can address these shortcomings by taking into account the socioeconomic backgrounds of students, as this can impact their readiness for blended learning, potentially hindering improvements in self-regulated learning. Additionally, future studies should consider the readiness and availability of school resources to support blended learning implementation. Furthermore, the instruments utilized in this study were found to have several deficiencies. Consequently, it remains unclear whether the blended learning model employed effectively enhanced students' self-regulated learning, as the experimental implementation of the model was not executed satisfactorily.

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