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Implementation of Deep Learning on Improving Emotional Intelligence and Learning Motivation of Fifth Grade MI Students

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Abstract: This study is limited by the lack of empirical research examining the application of deep learning in madrasahs with an emphasis on the emotional and motivational aspects of students. Previous studies have generally focused more on cognitive learning outcomes, so the effects of deep learning on emotional intelligence and learning motivation have not been widely explored. This study aims to examine the relationship and influence of deep learning on emotional intelligence and learning motivation. The method used is a quantitative approach with a correlational design. The research subjects involved 31 respondents consisting of students and teachers as supporting respondents. Data collection was carried out using a five-point Likert scale questionnaire with 18 statements. Data analysis was performed using JASP software through descriptive statistics and multiple linear regression techniques. The results showed that deep learning had a significant effect on emotional intelligence and learning motivation, as indicated by a significance value of < 0.05 and an R^2 value of 0.897. These findings confirm the novelty of the research in integrating deep learning with the strengthening of emotional and motivational dimensions in the context of madrasahs, and provide implications for the development of more comprehensive learning.

Keywords: Deep Learning; Emotional Intelligence; Learning Motivation.

Abstrak: Penelitian ini masih terbatas oleh kurangnya penelitian empiris yang mengkaji penerapan pembelajaran *deep learning* dalam lingkungan madrasah dengan menekankan aspek emosional dan motivasional peserta didik. Penelitian terdahulu umumnya lebih menitikberatkan pada hasil belajar kognitif, sehingga pengaruh pembelajaran *deep learning* terhadap kecerdasan emosional dan motivasi belajar belum banyak diungkap. Penelitian ini bertujuan untuk mengkaji hubungan serta pengaruh pembelajaran *deep learning* terhadap kecerdasan emosional dan motivasi belajar. Metode yang digunakan adalah pendekatan kuantitatif dengan desain korelasional. Subjek penelitian melibatkan 31 responden yang terdiri atas peserta didik dan guru sebagai responden pendukung. Pengumpulan data dilakukan menggunakan instrumen angket skala Likert lima tingkat dengan 18 pernyataan. Analisis data dilakukan menggunakan perangkat lunak JASP melalui teknik statistik deskriptif dan regresi linear berganda. Hasil penelitian menunjukkan bahwa pembelajaran *deep learning* memberikan pengaruh yang signifikan terhadap kecerdasan emosional dan motivasi belajar, ditunjukkan oleh nilai signifikansi < 0,05 serta nilai R^2 sebesar 0,897. Temuan ini menegaskan kebaruan penelitian dalam mengintegrasikan pembelajaran deep learning dengan penguatan dimensi emosional dan motivasional dalam konteks madrasah, serta memberikan implikasi bagi pengembangan pembelajaran yang lebih komprehensif.

Kata Kunci: *Deep Learning;* Kecerdasan Emosional; Motivasi Belajar.

INTRODUCTION

Learning motivation is the drive for students to understand the material and complete tasks well (Vidy et al., 2025). Motivated students tend to be more active, persistent, and creative. *Deep learning* methods can increase learning motivation

because students are directly involved in the learning process (Arif, 2025). Activities such as projects, experiments, and conceptual discoveries make students feel that they have an active role to play. High motivation also encourages curiosity and a desire to learn more (Tang & He, 2023). With increased motivation, students become more enthusiastic about attending classes. This demonstrates the importance of methods that combine enjoyable and challenging learning experiences. Emotional intelligence is the ability of students to recognise, control, and express emotions appropriatel (Arias et al., 2022). For Year 5 Madrasah Ibtidaiyah (MI) students, this skill is important for supporting social interaction and learning. Students with good emotional intelligence are usually better able to cope with difficulties and work together with their peers (Syafitri, 2024). Through deep learning, students are given the opportunity to practise patience, empathy and responsibility. Activities such as group discussions and reflection help students understand their own feelings and those of others (Afifah et al., 2024). Improved emotional intelligence also supports concentration and focus while studying (Nafi'ah & Faruq, 2025).

Deep learning-based learning supports the development of students' emotional intelligence (Khatijah et al., 2025). Reflection and group work help students recognise their feelings and themes (Sentia et al., 2025). Activities that require cooperation train patience, empathy, and responsibility. Students learn to manage frustration when facing learning difficulties (Chitrakar & P.M., 2023). This helps them become more confident and able to interact well. With consistent practice, students' emotional intelligence improves and supports a more effective learning process (Saihu, 2022). This strategy makes learning a more meaningful and enjoyable experience (Zhoc et al., 2018). Based on previous research deep learning has a positive effect on students' emotional intelligence (Rahmani, 2021). According to Kistiari & Ahmadi (2024), the application of this approach can increase empathy, self-awareness, and the ability to work together through reflective activities. According to Kasumi & Xhemaili (2023), learning processes that emphasise deep understanding help students recognise their own feelings and manage their emotions while studying. According to Istiara et al (2025), *deep learning* not only improves academic performance, but also supports students' emotional development. However, empirical studies related to the application of deep learning in madrasah ibtidaiyah are still limited. According to Ahmad & Mawarni (2021), deep learning has a significant effect on improving the emotional intelligence of MI students in Islamic education.

According to Wahyuni (2025), this shows that in addition to emotional intelligence, deep learning has also been proven to influence students' motivation to learn. According to Hassan et al., this approach can increase intrinsic motivation because students feel that learning has become more challenging and meaningful (Hassan et al. 2020). According to Kasumi & Xhemaili (2023), reflective and collaborative activities in deep learning make students more confident and enthusiastic about learning. However, most previous studies have only emphasised academic achievement or been conducted in mainstream schools (Hakim, 2025). There is still little research examining the effects of *deep learning* on learning motivation in madrasah ibtidaiyah (Islamic elementary schools) (Abubakari, 2024). There is a research gap that needs to be filled in order to prove the effectiveness of this approach in the context of basic Islamic education. Preliminary observations of Year 5 pupils at MI Tarbiyah Islamiyah show that some pupils still have difficulty

managing their emotions during the learning process. Their level of participation and motivation to learn is low, with a tendency to be passive. More engaging and interactive learning methods are needed so that students can think more actively and reflect on the material being studied. According to Milatina, this condition has an impact on low emotional intelligence and learning motivation among students (Milatina, 2025). Based on previous theories and research, *deep learning* can be a solution to improve both aspects (Kuleto et al., 2021). From a research perspective, there are still shortcomings because few studies have examined the simultaneous effects of deep learning on emotional intelligence and learning motivation in madrasahs (Della, 2025). The novelty of this study lies in its focus on examining the effects of deep learning on two non-cognitive aspects simultaneously in the context of Islamic primary education (Saridudin, 2025).

A review of previous studies indicates that research into the application of deep learning and its impact on the emotional intelligence and learning motivation of madrasah students remains limited. Most previous studies have focused primarily on the impact of deep learning on cognitive aspects or academic achievement, whilst its role in supporting students' emotional and motivational development has not been extensively examined, particularly within the context of Islamic primary education (Madrasah Ibtidaiyah). Emotional intelligence and learning motivation are key factors in determining the success of the learning process and students' personal development. This situation highlights a gap in the research literature whilst underscoring the importance of adopting a learning approach that not only focuses on academic achievement but also fosters students' emotional awareness and internal motivation to learn. In the context of contemporary education, students are not only required to possess cognitive competencies but also the ability to recognise, manage, and express emotions appropriately throughout the learning process. Therefore, this study aims to analyse the impact of implementing deep learning on the emotional intelligence and learning motivation of Year 5 pupils at Madrasah Ibtidaiyah (MI), particularly in helping pupils recognise and manage emotions and enhance their learning motivation, thereby contributing to the development of more effective and comprehensive learning strategies.

METHODE

This study employs a quantitative approach with a correlational design to examine the relationship and influence between deep learning, emotional intelligence, and student learning motivation (Munte & Samosir, 2019). Limitations of previous studies indicate that research on the application of deep learning in the context of madrasahs, particularly in relation to students' emotional and motivational aspects, is still rare. Against this background, this study aims to obtain An empirical description of the extent to which deep learning can support students' ability to recognise and manage emotions, while also increasing their motivation to learn. The research subjects consisted of 31 respondents, comprising 17 fifth-grade MI students as the main respondents and 12 teachers who acted as supporting parties. Data collection was conducted using an 18-item questionnaire based on a five-point Likert scale, which was designed to measure the three research variables systematically.

The research procedure was carried out through the stages of instrument development based on theory and previous research, data collection, tabulation and

data filtering and data analysis (Permatasari et al., 2025). The analysis was conducted using JASP software, including descriptive statistics to describe the conditions of each variable and multiple linear regression tests to examine the effect of deep learning on students' emotional intelligence and learning motivation. The use of these analysis techniques enabling researchers to gain a deeper understanding of the effectiveness of *deep learning* in the context of madrasah education. The research flow can be seen in the image below.

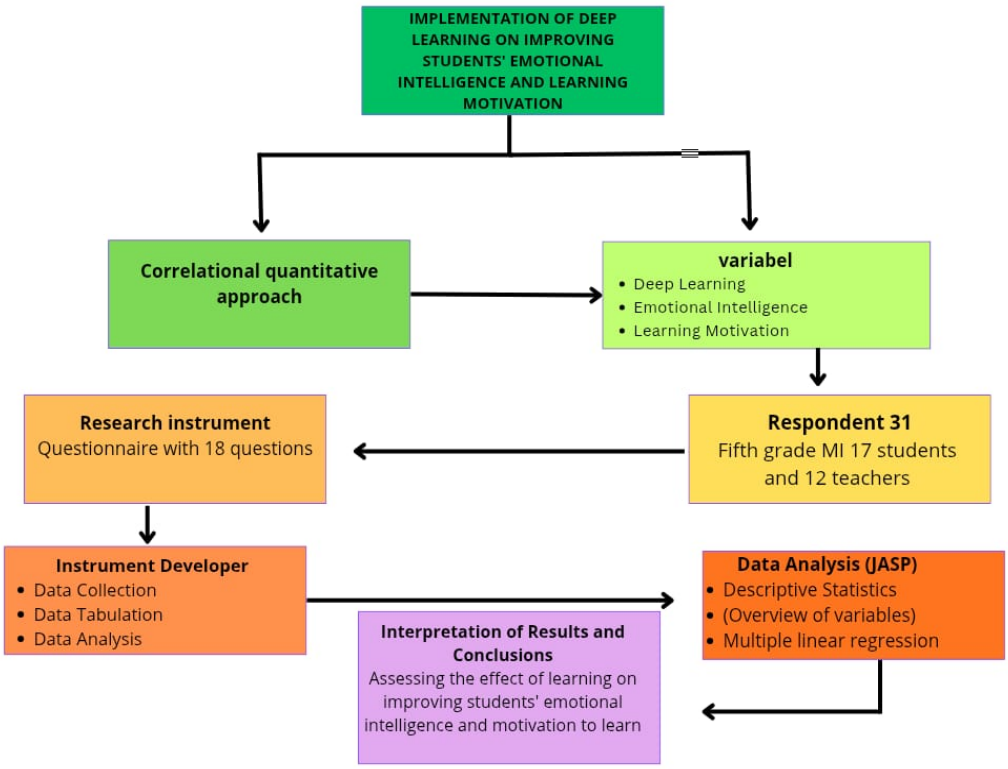

Figure 1. Research Process

Based on the research method outlined above, it can be concluded that this study uses a quantitative approach by defining the problems and objectives to be achieved. The conclusion of the research process shows that the study began with the selection of samples, including students and teachers. Initial data was collected to determine emotional intelligence and learning motivation prior to treatment. Deep learning-based learning was applied to assess its impact. Final data was collected to observe changes in learning outcomes and emotional development. The data was examined and cleaned. Descriptive and statistical analyses were conducted to test the effects. As well as the results analysed to conclude the effectiveness of learning in improving emotional intelligence and learning motivation among fifth-grade MI students.

RESULTS AND DISCUSSIONS

This study involved several stages to understand the implementation of deep learning-based learning on improving students' emotional intelligence and learning motivation. The first stage involved developing a questionnaire based on research variable indicators. A questionnaire with 18 prepared questions was then distributed

to 31 respondents, consisting of 17 fifth-grade students and 14 teachers, through MI Tarbiyah Islmiah as a data collection method. After data collection was completed, the data obtained was tabulated and analysed using JASP software, which was selected as the main analysis tool to support the data analysis process. The distribution of respondents is shown in Figure.

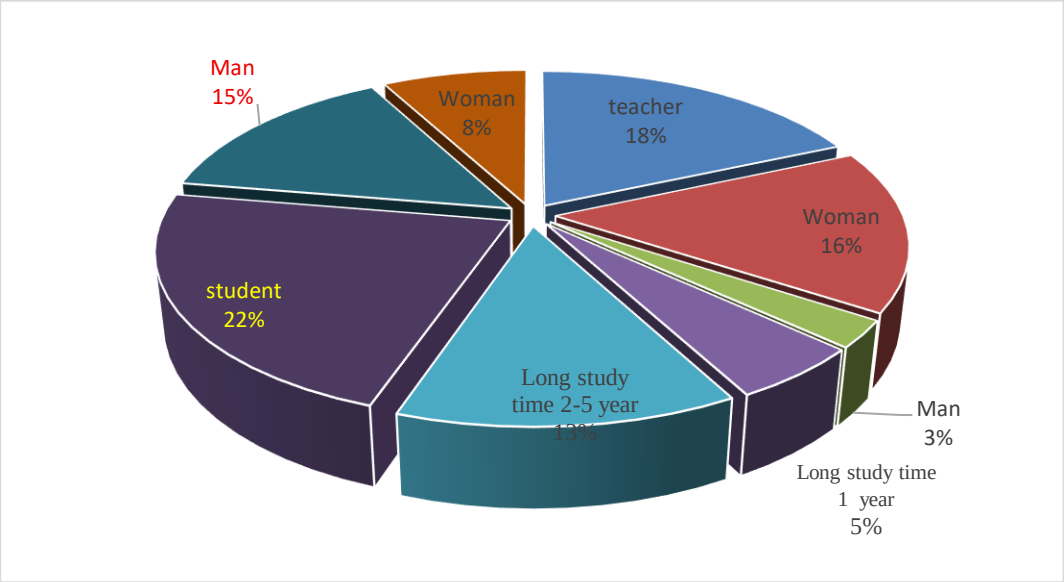

Figure 2. Distribution of Respondent Data

Figure 2 presents a distribution of characteristics describing the distribution of respondents based on role, gender, and length of teaching experience. The group with the largest proportion was students, who accounted for 22% of the total respondents, indicating that students were the main contributors to the research questionnaire. In addition, the teacher category also showed a fairly high level of participation with a percentage of 18%, indicating that educators also made a significant contribution to the provision of data.

In terms of teaching experience, respondents with 2–5 years of service dominated the educator category with a percentage of 13%, indicating that most teachers are in the middle stage of professional development. Teachers with one year of teaching experience accounted for 5%, showing less involvement than educators who are still in the early stages of their careers. In the category of type In terms of gender, female respondents accounted for 16%, while males accounted for 15%, indicating a relatively balanced gender distribution. There were also groups with smaller proportions, such as 8% female and 3% male, indicating the existence of minority respondent categories in the overall data structure. The descriptive statistics table presented in Table 1 provides data variation for each research variable. Information on the mean values and data variation for each research.

Table 1. Descriptive Statistics

Descriptive Statistics			
	V1	V2	V3
Mean	71.16	69.26	71.81
Std. Deviation	20.07	19.54	19.01
Variance	402.7	381.9	361.4
Skewness	-1.186	-1.120	-1.325

Std. Error of Skewness	0.421	0.421	0.421
Kurtosis	1.107	0.906	1.985
Std. Error of Kurtosis	0.821	0.821	0.821
Shapiro-Wilk	0.875	0.886	0.871
P-value of Shapiro-Wilk	.002	.003	.002
Minimum	20.00	20.00	20.00
Maximum	100.0	100.0	100.0

Table 1 shows the results of descriptive statistical analysis of the three data columns, indicating that the average values range from 69.26 to 71.81, accompanied by a fairly large degree of dispersion as reflected in the standard deviation, which is in the range of 19.01 up to 20.07 and a variance between 361.4 and 402.7. The distribution of the three columns shows a negative skewness value, which indicates that the data tends to be distributed to the right, while a positive kurtosis value indicates that the data distribution has a more pointed peak than a normal distribution. The Shapiro-Wilk normality test results show a significance value of $p < 0.01$ in all columns, so it can be stated that the data does not meet the normality assumption. The minimum value of 20.00 and maximum value of 100.00 in all columns indicate that the data covering the entire range of measurement scales used. The fit assessment table presented in Table 2 evaluates the fulfilment of the assumption of data normality as the basis for the use of parametric statistical analysis.

Tabel 2. Fit Assesment

Test	Statistic	p
Kolmogorov-Smirnov	0.222	.093

Table 2 above shows that the Kolmogorov–Smirnov normality test produced a statistical value of 0.222 with a significance value (p-value) of 0.093. Because the p-value is above the conventional significance threshold ($\alpha = 0.05$), there are no strong grounds for rejecting the null hypothesis that the data follow the distribution being tested, generally the normal distribution. The results show that the data does not deviate significantly from the theoretical distribution, so it can be said that that the data distribution pattern is still falls within an acceptable range as being consistent with or close to a normal distribution. Thus, these findings provide support that the data is suitable for analysis using parametric statistical methods.The Model Summary table presented in Table 3 serves to assess the ability of the regression model to explain the variation in the dependent variable based on the R^2 and Adjusted R^2 values. These values indicate the degree of influence of the independent variables on the dependent variable.

Table 3. Model Summary

Model	R	R^2	Adjusted R^2	RMSE
M_0	0.000	0.000	0.000	19.010
M_1	0.947	0.897	0.890	6.306

Note. M_1 includes Column 1, Column 2

Table 3 shows the difference in performance between Model M_0 and M_1. Model M_0, which does not involve the redicto redictor, produces R, R^2, and Adjusted R^2 values of 0.000, indicating that the model is unable to explain the variation in the redicto dependent. The RMSE value of 19.010 also indicates a high prediction error, meaning that this model does not provide meaningful predictive contributions.

Conversely, Model M_1, which includes Column 1 and Column 2 as predictors, shows a significant improvement in performance, with an R value of 0,947 which shows a very strong linear relationship betweenredicto. dependent. In addition, an R^2 value of 0.897 and an Adjusted R^2 value of 0.890 indicate that approximately 89% of the variation in Column 3 can be explained by the two predictors, while the decrease in RMSE to 6.306 indicates a substantial improvement in prediction accuracy. Overall, these results confirm that Model

Tabel 4. Uji ANOVA

Model		Sum of Squares	df	Mean Square	F	p
M_1	Regression	9727	2	4863.72	122.3	< .001
	Residual	1113	28	39.76		
	Total	10841	30			

Note. M_1 includes Column 1, Column 2

Note. The intercept model is omitted, as no meaningful information can be shown.

Table 4 shows that Model M_1 is significant overall in explaining the variation in the dependent variable. The Sum of Squares value for the regression component is 9.727 with a degree of freedom (df) of 2, resulting in a Mean Square of 4.863.72, while the Sum of Squares residual is 1.113 with a df of 28, resulting in a Mean Square of 39.76. The high F value of 122.3, accompanied by a significance level of $p < .001$, indicates that the regression model has very strong predictive power and is statistically significant. Thus, the variables predictors in Model M_1 contributed substantially to explaining the total variation of 10,841 in the dependent variable. These results confirm that the model has a good level of fit and is suitable for use in further analysis. The coefficient test table presented in Table 5 assesses the effect of independent variables on dependent variables individually.

Tabel 5. Uji Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
M_0	(Intercept)	71.806	3.414		21.032	< .001
M_1	(Intercept)	7.239	4.281		1.691	.102
	V1	0.482	0.193	0.509	2.501	.019
	V2	0.437	0.198	0.449	2.203	.036

Table 5 regression coefficients show that in Model M_0, the intercept has a value of 71.806 with a standard error of 3.414, and a t-value of 21.032 with $p < .001$, confirming that the intercept is significantly different from zero and represents the mean value of the dependent variable without predictors. In Model M_1, the intercept is 7.239 with a standard error of 4.281, but it is not significant ($t = 1.691$; $p = 0.102$), so it does not contribute significantly to the model. Conversely, both predictor variables, Column 1 and Column 2, show a significant effect on the dependent variable. Column 1 has a coefficient of 0.482 ($t = 2.501$; $p = 0,019$) and Column 2 has a coefficient of 0.437 ($t = 2.203$; $p = 0.036$), indicating that each variable makes a positive and significant contribution in predicting the value of the dependent variable. Standardized coefficients of 0.509 for Column 1 and 0.449 for Column 2 show that both predictors have relatively comparable influence. Overall, Model M_1 shows that both predictor variables are important and significant components in explaining the variation in the dependent variable.

The results of the study identified that the application of *deep learning* plays a significant role in improving students' emotional intelligence and learning motivation in madrasahs (Weng et al., 2023). The relatively high average scores across all research variables indicate that the learning process has been effective in encouraging active engagement and deeper understanding. The differences in responses among respondents reflect the diversity of learners' experiences, which is consistent with the characteristics of *deep learning* that emphasises the active role of students in constructing knowledge in a reflective and Contextual learning (Shella et al., 2025).

Regression analysis shows that the research model has a very strong explanatory power, as indicated by a coefficient of determination value of 0.897. This finding indicates that most of the variation in learning motivation can be explained by a combination of *deep learning* and emotional intelligence (Lin et al., 2022). The significance of the model was simultaneously reinforced by the results of the ANOVA test, which confirmed that both independent variables together had a significant effect on learning motivation (Maulana et al., 2025). Theoretically, these findings are consistent with Self-Determination Theory, which asserts that meaningful and challenging learning contributes to increased intrinsic motivation through the fulfilment of learners' needs for autonomy, competence, and social connectedness.

The findings of this study can be understood through a social constructivist approach and emotional intelligence theory, which emphasise the importance of interaction, reflection, and the meaning of students' learning experiences (Tiara Ananda Dew, 2023). Deep learning enables learners to integrate new knowledge with previous experiences, thereby not only impacting cognitive mastery but also supporting the development of emotional awareness and self-regulation skills (Panadero et al. 2021). However, the strength of the relationship between variables also needs to be interpreted by considering the institutional context of madrasahs, the role of teachers as facilitators, and academic and religious culture. Therefore, further research is recommended to include other variables, such as self-regulation, social support, and classroom climate, in order to obtain a more comprehensive understanding.

CONCLUSION

The results of the study concluded that *deep learning* had a significant effect on improving the emotional intelligence and learning motivation of fifth-grade students at MI Tarbiyah Islamiah. as evidenced by the t-test results with a significance value of < 0.05 and an R^2 value of 0.897, indicating that 89.7% of the variation in learning motivation can be explained by the variables of deep learning and emotional intelligence. These findings confirm that the deep learning approach is effective in strengthening intrinsic motivation, improving emotional management skills, and encouraging student engagement in learning. For further research, it is recommended to expand the sample size, involve schools with different characteristics, and consider adding moderating or mediating variables such as self-regulated learning or creativity, so that the research results have stronger generalisation and are able to provide a more comprehensive understanding of the

mechanism of the influence of *deep learning* on the emotional development and learning motivation of students.

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