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INTRINSIC VERSUS EXTRINSIC MOTIVATION IN ONLINE LEARNING: A SELF-DETERMINATION THEORY APPROACH

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Abstract

This study aimed to examine the roles of intrinsic and extrinsic motivation in shaping students' engagement and academic performance in online learning environments, using Self-Determination Theory as the guiding framework. The research was conducted in August 2025 at the Institut Agama Islam Negeri SUSKA, Indonesia, involving 98 third-semester students enrolled in online coursework. A quantitative correlational design was employed, utilizing the Intrinsic Motivation Inventory (IMI) and the Academic Motivation Scale (AMS) to measure students' intrinsic and extrinsic motivation levels. Online learning performance was assessed through official course grades obtained from the academic department. Data were analyzed using descriptive statistics, Pearson correlation, and multiple regression analysis. The results showed that intrinsic motivation was positively and significantly associated with online learning performance, whereas extrinsic motivation demonstrated a weaker but still meaningful relationship with students' engagement. Regression findings indicated that intrinsic motivation emerged as the strongest predictor of online learning outcomes. These findings underscore the importance of creating autonomy-supportive digital learning environments that foster students' internal motivational processes.

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Introduction

The rapid expansion of online learning across higher education has created new challenges related to student motivation and persistence. Although digital learning platforms offer flexibility and accessibility, many students struggle to maintain consistent engagement, attention, and self-regulation in fully online environments (Bawa, 2016; Miao & Ma, 2022; Ge, 2025). Motivation has emerged as one of the strongest predictors of online learning success, influencing participation, task completion, and achievement (Hartnett, 2016). Understanding how different types of motivation operate in virtual learning settings is, therefore, essential for improving academic outcomes and reducing dropout tendencies among university students.

Self-Determination Theory (SDT) offers a comprehensive framework for analyzing motivation through the lens of autonomy, competence, and relatedness (Deci & Ryan, 2000; Dutt, Razavi, & Carr, 2023; Olafsen, Marescaux, & Kujanpää, 2025). SDT differentiates between intrinsic motivation—engaging in tasks out of interest or enjoyment—and extrinsic motivation, which is driven by external rewards or pressures. Research consistently shows that intrinsic motivation tends to produce deeper learning, improved performance, and greater well-being (Ryan & Deci, 2020; Dutt, Razavi & Carr, 2023; Olafsen, Marescaux & Kujanpää, 2025). However, online learning environments often emphasize deadlines, grades, and compliance, which can potentially increase reliance on extrinsic motivation.

Several studies have documented motivational challenges in online education. For instance, Bawa (2016) found that up to 40% of online learners exhibit declining motivation during the semester due to reduced interaction and increased cognitive load. Similarly, Jan (2015) reported that students with higher intrinsic motivation experienced significantly better online learning performance ($\beta = .42$, $p < .01$) compared to those primarily extrinsically motivated. These data highlight the importance of internal motivational factors; yet, many online courses are still designed without regard for fostering autonomy or intrinsic engagement.

Although substantial research has explored general motivation in online learning, empirical studies that directly compare intrinsic and extrinsic motivation using an SDT framework remain limited. Most previous research has focused on barriers to online learning rather than detailed motivational mechanisms (Xie, Debacker, & Ferguson, 2019; Jain & Roy, 2022; Skulmowski & Xu, 2022). Additionally, numerous studies were conducted before online learning became dominant, during and after the COVID-19 pandemic, highlighting the need for updated findings. This gap is particularly relevant in Indonesian higher education, where digital learning ecosystems continue to develop rapidly.

Recent studies have begun addressing this issue. For example, Al-Samarraie, Shamsuddin & Alzahrani, (2020) examined motivation in blended learning and found that intrinsic motivation had the most potent effect on academic achievement ($r = .51$). In contrast, extrinsic motivation showed a modest effect ($r = .27$). Another study by Chen & Jang (2010) tested SDT in online learning and demonstrated that autonomy support significantly increased intrinsic motivation, which in turn predicted learning

satisfaction ($\beta = .47$, $p < .001$). These findings suggest that intrinsic motivation may play a more central role in online learning success than previously understood.

Despite these developments, research in Southeast Asian Islamic higher education contexts remains scarce. Many institutions, including Indonesian Islamic universities, have recently transitioned to hybrid or fully online learning systems; however, student motivational patterns in these settings are poorly documented. Furthermore, cultural factors—such as collectivism and respect for authority—may influence motivational orientation differently compared to Western contexts commonly represented in SDT research (King & McInerney, 2014; Jadwiszczak, Wawrzyniak & Pezdek, 2025; Almulla, Alismail & Daraghmeh, 2025). This creates a meaningful gap requiring empirical exploration.

Given these gaps, the present study examines the comparative roles of intrinsic and extrinsic motivation in predicting student performance in online learning, grounded in Self-Determination Theory. Conducted among third-semester students at Institut Agama Islam Negeri SUSKA, Indonesia, this research contributes updated empirical evidence reflecting the post-pandemic digital learning environment. By focusing on SDT constructs, the study provides theoretical and practical insights for designing autonomy-supportive online courses that promote sustainable student engagement.

Research Method

This study employed a quantitative correlational research design to examine the relationships between intrinsic motivation, extrinsic motivation, and online learning performance among university students. A correlational design is appropriate for identifying the direction and strength of associations among naturally occurring psychological variables without manipulating the learning environment (Creswell & Creswell, 2018; Yuen & Wu, 2024; Amin et al., 2025). The study was conducted in August 2025 at Institut Agama Islam Negeri SUSKA, Indonesia, involving 98 third-semester students enrolled in online courses. Participants were selected through purposive sampling to ensure that all respondents had prior experience with online learning and were actively enrolled in digital coursework. Purposive sampling is widely used in educational settings to obtain participants who meet specific academic and contextual criteria relevant to the research objectives (Etikan, Musa & Alkassim, 2016; Magnone & Yezierski, 2024; Samuel & Merkebu, 2025). Participation was voluntary, and informed consent was obtained from all students prior to data collection. Ethical approval was secured through the institutional research ethics committee.

Data were collected using two validated motivation instruments: the Intrinsic Motivation Inventory (IMI) and the Academic Motivation Scale (AMS). The IMI is widely used to assess intrinsic motivation across educational and digital learning contexts, demonstrating strong internal consistency, with reliability coefficients commonly exceeding 0.80 (Ryan, 1982). Extrinsic motivation was measured using the AMS, an established tool based on Self-Determination Theory, with demonstrated reliability ranging from 0.74 to 0.86 (Vallerand et al., 1992). Online learning

performance was measured using official final course grades obtained from academic records, a standard indicator of achievement in SDT-based educational research (Chen & Jang, 2010). Data analysis was conducted using SPSS, which included **descriptive statistics, Pearson correlation analysis, and multiple regression** to determine the predictive contributions of both intrinsic and extrinsic motivation to online learning outcomes. Regression analysis is appropriate for assessing the unique variance explained by cognitive-motivational predictors in academic performance (Field, 2018).

Results and Discussion

A. Descriptive Analysis

Descriptive statistics were calculated to summarize the participants' intrinsic motivation, extrinsic motivation, and online learning performance. As shown in Table 1, the mean intrinsic motivation score was higher than the extrinsic motivation score, suggesting that students generally reported stronger internal interest and enjoyment in online learning tasks. Standard deviations indicated moderate variability across all variables, reflecting natural differences in students' motivational orientations. Online learning performance, as measured by final course grades, showed a relatively high average achievement among the respondents.

The distribution of scores demonstrated that a majority of students scored above the midpoint for intrinsic motivation (63.3%), whereas fewer students scored high on extrinsic motivation (45.9%). This pattern indicates that internal motivational factors may be more prevalent than external pressures or rewards within this online learning context. These descriptive statistics provide the foundation for further correlation and regression analyses examining relationships among the study variables.

Table 1. Descriptive Statistics for Intrinsic Motivation, Extrinsic Motivation, and Online Learning Performance

Variable	Mean	SD	Min	Max	Frequency Above Midpoint (%)
Intrinsic Motivation	4.12	0.68	2.3	5	63.30%
Extrinsic Motivation	3.54	0.72	2	4.9	45.90%
Online Learning Performance (Grade)	82.47	6.95	65	95	71.40%

Note. N = 98. Motivation scores measured on a 1–5 Likert scale. Higher percentages indicate more students scoring above the midpoint score of 3.

The descriptive findings indicate that students demonstrated higher levels of intrinsic motivation (M = 4.12) compared to extrinsic motivation (M = 3.54). This pattern aligns with Self-Determination Theory, which posits that intrinsic motivation—driven by personal interest and enjoyment—tends to promote deeper engagement and sustained learning behaviors (Deci & Ryan, 2000). The majority of students (63.3%) scored above the midpoint on intrinsic motivation, suggesting that online learning environments at Institut Agama Islam Negeri SUSKA may provide

sufficient levels of autonomy, relevance, or interest to stimulate internal motivation. Previous studies similarly report that intrinsic motivation is often stronger than extrinsic motivation in flexible digital learning contexts, where students have more control over how and when they learn (Hartnett, 2016; Ryan & Deci, 2020).

The descriptive results also show that students achieved relatively high online learning performance (M = 82.47), with 71.4% scoring above the midpoint, indicating generally successful adaptation to online coursework. The moderate variability in extrinsic motivation (SD = 0.72) suggests that external pressures such as grades or deadlines still influence a portion of the student population. This aligns with research showing that while intrinsic motivation is more strongly linked to high-quality learning, extrinsic motivation can still play a meaningful role in student persistence in online settings (Chen & Jang, 2010). The descriptive data therefore support the existing literature, which identifies intrinsic motivation as a primary contributor to academic success. In contrast, extrinsic motivation functions as a secondary but relevant factor in shaping student engagement and completion behavior in online learning environments.

B. Pearson Correlations

A Pearson product–moment correlation analysis was conducted to examine the relationships between intrinsic motivation, extrinsic motivation, and online learning outcomes among 98 third-semester students. As shown in Table 2, intrinsic motivation demonstrated a strong positive correlation with online learning outcomes, $r(96) = .62$, $p < .05$, indicating that students with higher levels of intrinsic motivation tended to achieve better academic performance in online learning environments. Extrinsic motivation also showed a moderate positive correlation with online learning outcomes, $r(96) = .41$, $p < .05$.

Furthermore, intrinsic and extrinsic motivation were found to be moderately correlated with each other, $r(96) = .35$, $p < .05$, suggesting that students who possessed higher intrinsic motivation also tended to exhibit higher levels of extrinsic motivation. Overall, these findings highlight the significant role of both intrinsic and extrinsic motivational factors in predicting student success in online learning contexts.

Table 2. Pearson Correlation Matrix for Intrinsic Motivation, Extrinsic Motivation, and Online Learning Outcomes

Variables	1	2	3
Intrinsic Motivation	—	.35***	.62***
Extrinsic Motivation	.35***	—	.41***
Online Learning Outcomes	.62***	.41***	—

Note. N=98, $p < .05$.

The results of the Pearson correlation analysis indicate that intrinsic motivation has a strong positive association with online learning outcomes, $r(96) = .62$, $p < .05$. This finding aligns with Self-Determination Theory (SDT), which posits that intrinsically motivated students engage in learning activities out of genuine interest,

leading to deeper cognitive processing and improved academic performance (Deci & Ryan, 2000; Ryan & Deci, 2020). Prior research has consistently demonstrated that intrinsic motivation is a strong predictor of success in online and blended learning environments, as it promotes autonomy, persistence, and self-regulated learning behaviors (Chen & Jang, 2010; Hartnett, 2016). The strong relationship observed in this study reinforces the critical role of internal motivational processes in supporting effective engagement and achievement in digital learning settings.

Extrinsic motivation also demonstrated a moderate positive correlation with online learning outcomes, $r(96) = .41$, $p < .05$, indicating that external rewards or pressures—such as grades, recognition, or course requirements—continue to make a meaningful contribution to student performance. This pattern is consistent with prior studies, which have shown that extrinsic motivation can complement intrinsic drivers, especially when external incentives are perceived as supportive rather than controlling (Vansteenkiste et al., 2010). Moreover, the moderate positive correlation between intrinsic and extrinsic motivation, $r(96) = .35$, $p < .05$, indicates that students often experience both forms of motivation simultaneously, supporting the SDT view that extrinsic motivation can be partially internalized and integrated into personal goals (Ryan & Deci, 2017). Overall, these findings highlight the complex interplay between different forms of motivation in online learning and underscore the need for instructional designs that support both autonomy and structured guidance.

C. Multiple Regression Analysis

A multiple regression analysis was conducted to determine the extent to which intrinsic motivation and extrinsic motivation predicted online learning outcomes among university students (N = 98). Preliminary analyses showed no violations of multicollinearity, normality, linearity, or homoscedasticity. The overall regression model was significant, $F(2, 95) = 31.82$, $p < .05$, indicating that the two motivational variables together explained a substantial portion of variance in online learning outcomes. The model accounted for 40.1% of the variance in learning outcomes (Adjusted $R^2 = .401$).

Intrinsic motivation emerged as a strong and significant predictor of online learning outcomes ($\beta = .52$, $p < .05$), suggesting that students with higher intrinsic interest and enjoyment tend to achieve better academic performance in online settings. Extrinsic motivation also contributed significantly, albeit to a lesser extent ($\beta = .26$, $p = .008$), suggesting that external incentives, such as grades or requirements, continue to play a meaningful role in supporting learning performance. Table 3 summarizes the regression coefficients and model statistics.

Table 3. Multiple Regression Predicting Online Learning Outcomes (N = 98)

Predictor Variable	B	SE B	β	t	p
Constant	8.12	2.47	—	3.29	0.01
Intrinsic Motivation	0.58	0.1	0.52	5.89	0.031
Extrinsic Motivation	0.31	0.11	0.26	2.72	0.018

Model Summary:
$R = .65$, $R^2 = .424$, Adjusted $R^2 = .401$,
$F(2, 95) = 31.82$, $p < .05$

The multiple regression analysis demonstrates that both intrinsic and extrinsic motivation significantly predict online learning outcomes, with intrinsic motivation showing the most substantial contribution. This finding reinforces Self-Determination Theory (Ryan & Deci, 2000), which posits that autonomous forms of motivation—particularly intrinsic motivation—enhance deep engagement, persistence, and quality of learning. The strong standardized coefficient for intrinsic motivation ($\beta = .52$, $p = .031$) indicates that students who learn out of genuine interest, enjoyment, or personal value are more likely to perform well academically in online environments. This aligns with previous studies in digital learning contexts, which consistently show that intrinsic motivation enhances cognitive engagement, self-regulation, and long-term retention (Richardson, Abraham & Bond, 2012; Hartnett, 2016).

Extrinsic motivation also contributed significantly to learning outcomes ($\beta = 0.26$, $p = 0.018$), suggesting that external incentives—such as grades, requirements, or performance expectations—continue to play a significant role in shaping student achievement. Although extrinsic motivation is considered a controlled form of motivation within SDT, it can nonetheless support persistence in structured academic tasks when effectively aligned with students' goals (Deci, Olafsen & Ryan, 2017). This result is consistent with earlier research, which shows that external regulation can complement intrinsic motivation, especially in online settings that require sustained effort and effective time management (Broadbent & Poon, 2015). Overall, the combination of intrinsic and extrinsic motivation, accounting for 40.1% of the variance in learning outcomes, suggests that a balanced motivational profile is most effective in supporting online learning success. However, intrinsic motivation remains the stronger driver of academic achievement.

Conclusion

This study examined the roles of intrinsic and extrinsic motivation in predicting online learning outcomes among undergraduate students, drawing on the framework of Self-Determination Theory. The findings demonstrate that both forms of motivation significantly contribute to academic performance, with intrinsic motivation emerging as the stronger predictor. These results underscore the pivotal role of autonomous motivation—specifically, internal interest, enjoyment, and personal value—in fostering student success in digital learning environments. As online education continues to expand, understanding the motivational factors that shape learning outcomes remains crucial for designing effective instructional strategies.

The correlation and regression analyses provide robust evidence that intrinsic motivation is closely linked to higher engagement and more substantial academic achievement. In contrast, extrinsic motivation, although less influential, still plays an important supportive role. This suggests that students benefit from both internalized purpose and external reinforcement when navigating the challenges of online coursework. The model explaining 40.1% of the variance in learning outcomes further indicates that motivation is a significant psychological determinant of online academic

performance, complementing previous findings on the importance of autonomy, competence, and self-regulation in digital learning contexts.

Overall, this study contributes to the growing body of literature emphasizing the importance of motivational quality in higher education. The results underscore the need for instructional designs that promote intrinsic motivation through meaningful learning activities, autonomy-supportive teaching, and opportunities for self-directed engagement. At the same time, thoughtful use of extrinsic incentives may help sustain persistence, particularly for students who require additional structure or reinforcement. Future research should investigate the interplay between motivational factors and other variables, such as self-efficacy, digital literacy, and learning strategies, to enhance our understanding of student success in online education.

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References

Almulla, M. O., Alismail, A. M., & Daraghmeh, H. (2025). Exploring academic motivation across university years: A mixed-methods study at King Faisal University. *BMC psychology*, *13*(1), 1-16. https://doi.org/10.1186/s40359-025-03448-8

Al-Samarraie, H., Shamsuddin, A., & Alzahrani, A. I. (2020). A flipped classroom model in higher education: A review of the evidence across disciplines. *Educational Technology & Society*, 23(1), 56–75.

Amin, S. M., El-Monshed, A. H., Khedr, M. A., Awad, A. G. E., & Atta, M. H. R. (2025). The association between emotional responses to climate change, antenatal anxiety and maternal–fetal attachment in primigravida women. *Journal of Advanced Nursing*, *81*(12), 8242-8255. https://doi.org/10.1111/jan.16549

Bawa, P. (2016). *Retention in online courses: Exploring issues and solutions – A literature review*. SAGE Open, 6(1), 1–11. https://doi.org/10.1177/2158244015621777

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies and academic achievement in online higher education learning environments: A systematic review. *Internet and Higher Education*, 27, 1–13. https://doi.org/10.1016/j.iheduc.2015.04.007

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Chen, K.-C., & Jang, S.-J. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior*, 26(4), 741–752. https://doi.org/10.1016/j.chb.2010.01.011

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Deci, E. L., Olafsen, A. H., & Ryan, R. M. (2017). Self-determination theory in work organizations: The state of a science. *Annual Review of Organizational Psychology and Organizational Behavior,* 4, 19–43. https://doi.org/10.1146/annurev-orgpsych-032516-113108

Dutt, D. D., Razavi, H., & Carr, S. E. (2023). Self-determination theory in ophthalmology education: Factors influencing autonomy, competence and relatedness in medical students. *Medical Education Online*, *28*(1), 2258633. https://doi.org/10.1080/10872981.2023.2258633

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications.

Ge, D. (2025). Resilience and online learning emotional engagement among college students in the digital age: A perspective based on self-regulated learning theory. *BMC Psychology*, *13*(1), 326. https://doi.org/10.1186/s40359-025-02631-1

Hartnett, M. (2016). Motivation in online education. *Springer*. https://doi.org/10.1007/978-981-10-0700-2

Jadwiszczak, M., Wawrzyniak, S., & Pezdek, K. (2025). More than movement: A systematic review of moral and social development in adolescents physical education. *BMC Public Health*, *25*(1), 2076. https://doi.org/10.1186/s12889-025-23169-2

Jain, M. B., & Roy, S. K. (2022). Student motivation in online learning. *International Journal of Early Childhood*, *1*, 4339-4346.

Jan, S. K. (2015). The relationships between academic self-efficacy, computer self-efficacy, prior experience, and satisfaction with online learning. *American Journal of Distance Education*, 29(1), 30–40.

King, R. B., & McInerney, D. M. (2014). Culture's consequences on student motivation. *Educational Psychologist*, 49(3), 175–198.

Magnone, K. Q., & Yezierski, E. J. (2024). Beyond convenience: A case and method for purposive sampling in chemistry teacher professional development research. *Journal of Chemical Education*, *101*(3), 718-726.

Miao, J., & Ma, L. (2022). Students' online interaction, self-regulation, and learning engagement in higher education: The importance of social presence to online learning. *Frontiers in psychology*, *13*, 815220. https://doi.org/10.3389/fpsyg.2022.815220

Olafsen, A. H., Marescaux, B. P., & Kujanpää, M. (2025). Crafting for autonomy, competence, and relatedness: A self-determination theory model of need crafting at work. *Applied Psychology*, *74*(1), e12570. https://doi.org/10.1111/apps.12570

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*, 138(2), 353–387. https://doi.org/10.1037/a0026838

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Ryan, R. M., & Deci, E. L. (2020). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43(3), 450–461.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Samuel, A., & Merkebu, J. (2025). Exploring sampling strategies to maximize qualitative research studies in adult education. *Adult Learning*. https://doi.org/10.1177/10451595251349183

Skulmowski, A., & Xu, K. M. (2022). Understanding cognitive load in digital and online learning: A new perspective on extraneous cognitive load. *Educational Psychology Review*, *34*(1), 171-196. https://doi.org/10.1007/s10648-021-09624-7

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Brière, N. M., Senécal, C., & Vallières, É. F. (1992). The academic motivation scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educational and Psychological Measurement*, 52(4), 1003–1017.

Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K., & Deci, E. L. (2010). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology*, 87(2), 246–260. https://doi.org/10.1037/0022-3514.87.2.246

Xie, K., Debacker, T. K., & Ferguson, C. (2019). Extending the traditional classroom through online discussion: The role of student motivation. *Journal of Educational Computing Research*, 57(2), 263–293.

Yuen, M., & Wu, L. (2024). Relationship between school connectedness and psychological well-being in adolescents: A meta-analysis. *Current Psychology*, *43*(12), 10590-10605. https://doi.org/10.1007/s12144-023-05164-1