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## **The Relationship between Hybrid Learning Infrastructure and Learning Effectiveness at UIN Sunan Gunung Djati Bandung**

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### **ABSTRACT**

*Hybrid learning has emerged as an innovative approach in higher education, integrating online and face-to-face instruction to enhance academic flexibility. However, its effectiveness largely depends on the availability and readiness of educational infrastructure, including digital resources and learning support facilities. This study investigates the relationship between hybrid learning infrastructure and learning effectiveness in higher education, employing a quantitative survey method with a cross-sectional design. A total of 100 students were selected as respondents through stratified random sampling. Data were collected using a likert-scale questionnaire and analyzed through Pearson correlation analysis. The findings reveal a significant positive relationship between hybrid learning infrastructure and learning effectiveness, with hybrid learning laboratories identified as the most influential factor. However, synchronous learning encounters technical challenges that hinder its effectiveness. These results highlight the critical role of robust digital infrastructure in enhancing learning effectiveness. Therefore, strategic investment in digital facilities and the optimization of instructional design are essential for the sustainable transformation of higher education.*

**Keywords:** *Hybrid Learning, Learning Effectiveness, Educational Infrastructure, Higher Education*

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### **INTRODUCTION**

The rapid advancement of digital technology has significantly transformed the learning paradigm in higher education. The COVID-19 pandemic has accelerated the

adoption of online learning models, forcing a shift from face-to-face instruction to digital platforms. However, this transition has introduced various challenges, particularly regarding infrastructure readiness, technology

accessibility, and learning effectiveness (Dewantara & Nurgiansah, 2020). One of the primary concerns is the disparity in the availability of adequate facilities, which hinders students' ability to fully participate in online learning (Suni Astini, 2020).

Several previous studies have highlighted students' difficulties in adapting to online learning, including increased educational expenses due to internet costs and the limitations of digital devices such as tablets or laptops. Furthermore, the heavier academic workload has also negatively affected student motivation. Disparities in technological access further widen the academic gap between students with adequate resources and those with restricted access (Dewantara & Nurgiansah, 2020; Suni Astini, 2020).

To address these challenges, hybrid learning has been introduced as a strategic approach that integrates the strengths of online and face-to-face learning to enhance educational effectiveness (Ministry of Education, 2021). Beyond functioning as a temporary response to the pandemic, hybrid learning is increasingly transforming into a sustainable and adaptive model in higher education (Aristika et al., 2021). By combining conventional teaching methods with digital technology, hybrid learning fosters a more inclusive and student-centered learning environment (Nasution et al., 2019).

The success of hybrid learning depends on several factors, including infrastructure readiness, optimal pedagogical strategies, and the integration of technology to enhance student engagement (Rahayu & Haq, 2021). Previous studies have extensively explored the benefits of hybrid learning in enhancing student engagement (Zainudin et al., 2021). However, limited research has explicitly examined the role of hybrid learning infrastructure in supporting learning effectiveness in higher education.

This study aims to address this research gap by examining the role of hybrid learning infrastructure in enhancing learning effectiveness in higher education. To explore students' adoption and utilization of technology in hybrid learning environments, this study applies the Technology Acceptance Model (TAM) by (Davis, 1989). Through a quantitative approach, this study generates data-driven findings that validate the relationship between infrastructure and learning effectiveness, while offering empirical recommendations for improving hybrid learning facilities to enhance higher education quality.

Based on the literature review and identified issues, this study aims to address the following research questions:

1. How is hybrid learning infrastructure at UIN Sunan Gunung Djati Bandung?
2. How is learning effectiveness at UIN Sunan Gunung Djati Bandung?
3. How is the relationship between hybrid learning infrastructure and learning effectiveness at UIN Sunan Gunung Djati Bandung?

To answer these questions, this study formulates the following hypotheses: 1)  $H_0$ : There is no positive relationship between hybrid learning infrastructure and learning effectiveness. 2)  $H_1$ : There is a positive relationship between hybrid learning infrastructure and learning effectiveness.

## RESEARCH METHODS

This study employs a quantitative research method with a cross-sectional survey design to analyze the relationship between hybrid learning infrastructure and learning effectiveness. A cross-sectional approach was chosen as it allows for the measurement of variable relationships at a specific point in time, providing an objective representation of the current conditions (Creswell & Creswell, 2018). This design is particularly appropriate

for examining the impact of infrastructure on learning effectiveness without the influence of temporal variations.

The research population consists of 195 students enrolled in the hybrid learning program at the Faculty of Tarbiyah and Teacher Training, UIN Sunan Gunung Djati Bandung. The sample selection follows a stratified random sampling technique, ensuring proportional representation from ten academic majors: Islamic Education Management, Arabic Language Education, English Language Education, Mathematics Education, Chemistry Education, Biology Education, Physics Education, Early Childhood Education, Madrasah Ibtidaiyah Teacher Education, and Islamic Religious Education. The sample size of 100 students was determined using Yamane’s formula (Sugiyono, 2018):

$$n = \frac{N}{1 + N(e)^2}$$

Where N is the total population (195) and is the margin of error (5%). This ensures that the sample is representative of the broader student population while maintaining a reasonable level of statistical confidence.

The research instrument consists of a structured questionnaire with closed-ended questions, utilizing a five-point likert scale (1 = strongly disagree, 5 = strongly agree). The questionnaire includes 15 items measuring the independent variable (X: hybrid learning infrastructure) and 15 items measuring the dependent variable (Y: learning effectiveness). The indicators for each variable are outlined in the following table:

**Table 1. Indicators of Variabel X and Y**

<b>Indicators of Hybrid Learning Infrastructure</b>	<b>Indicators of Learning Effectiveness</b>
Hybrid Learning Laboratory	Quality of Learning
Synchronous Learning	Suitability of Learning Levels
Asynchronous Learning	Incentive
	Time

To ensure the validity and reliability of the instrument, the study conducted a content validity test through expert judgment and a construct validity test using Pearson’s Product-Moment correlation. Reliability was assessed using Cronbach’s Alpha.

Data analysis was conducted through several statistical procedures. First, the normality of the data was tested using the Kolmogorov-Smirnov test to determine whether the data followed a normal distribution. Next, Levene’s test was employed to assess the homogeneity of variances, ensuring that the variance of the data was equal across groups. The linearity of the relationships between variables was examined through an ANOVA-based linearity test. Descriptive statistical analysis was carried out using Microsoft Excel to summarize the data

according to each indicator. Finally, Pearson’s correlation analysis was conducted to measure the strength and direction of the relationship between hybrid learning infrastructure and learning effectiveness.

All statistical analyses were performed using SPSS version 25 to ensure computational accuracy and a comprehensive interpretation of the results. This approach enables a rigorous assessment of the hypothesized relationships and supports empirical recommendations for improving hybrid learning infrastructure in higher education.

## **RESULTS**

### **Validity Test**

The validity of the instrument was tested using the Pearson Product-Moment correlation at a significance level of  $\alpha = 0.05$ .

An instrument is considered valid if the calculated r-value (r-count) is greater than the critical r-value (r-table) of 0.195. The validity

test results for the two variables are presented as follows:

**Table 2. Validity test results for variable X**

Item	r-count	>/<	rtable	Validity
1.	0,323	>	0,195	Valid
2.	0,454	>	0,195	Valid
3.	0,585	>	0,195	Valid
4.	0,587	>	0,195	Valid
5.	0,337	>	0,195	Valid
6.	0,458	>	0,195	Valid
7.	0,545	>	0,195	Valid
8.	0,576	>	0,195	Valid
9.	0,575	>	0,195	Valid
10.	0,634	>	0,195	Valid
11.	0,676	>	0,195	Valid
12.	0,664	>	0,195	Valid
13.	0,648	>	0,195	Valid
14.	0,582	>	0,195	Valid
15.	0,496	>	0,195	Valid

The analysis results indicate that all items of Variable X have r-count values greater than r-table (0.195), confirming that all

statement items are valid and can be used to measure hybrid learning infrastructure.

**Table 3. Validity test results for variable Y**

Item	r-count	>/<	rtable	Validity
1	0,674	>	0,195	Valid
2	0,665	>	0,195	Valid
3	0,597	>	0,195	Valid
4	0,637	>	0,195	Valid
5	0,551	>	0,195	Valid
6	0,734	>	0,195	Valid
7	0,454	>	0,195	Valid
8	0,575	>	0,195	Valid
9	0,623	>	0,195	Valid
1	0,680	>	0,195	Valid
1	0,626	>	0,195	Valid
1	0,727	>	0,195	Valid
1	0,682	>	0,195	Valid
1	0,714	>	0,195	Valid
1	0,669	>	0,195	Valid

Based on the validity test results, all items of Variable Y have r-count values greater than r-table (0.195), confirming that all statement items are valid in measuring learning effectiveness.

All research instruments have satisfied the validity criteria. Therefore, these instruments can be effectively utilized to analyze the relationship between hybrid learning infrastructure and learning

effectiveness in higher education (Sugiyono, 2018).

**Reliability Test**

Reliability test was conducted to assess the internal consistency of the research instruments using Cronbach’s Alpha.

According to Nunnally & Bernstein (1994), an instrument is considered reliable if its Cronbach’s Alpha coefficient is  $\geq 7$ . The reliability test results for both variables are as follows:

**Table 4. Reliability test results**

Variabel	Cronbach’s Alpha	N of Items
X	0,830	15
Y	0,896	15

The analysis results indicate that the research instrument achieves a Cronbach’s Alpha value of 0.830 for variable X and 0.896 for variable Y, both exceeding the minimum threshold of 0.7. These findings confirm that the instrument demonstrates a high level of internal consistency, ensuring its reliability in measuring the relationship between hybrid learning infrastructure and learning effectiveness in higher education.

**Normality Test**

The normality test was conducted to determine whether the research data followed a normal distribution, which is a fundamental assumption in parametric statistical analysis. In this study, normality was assessed using the One-Sample Kolmogorov-Smirnov Test with unstandardized residuals.

**Table 5. Normality test result**

One-Sample Kolmogorov-Smirnov Test	
	Unstandardized Residual
N	100
Mean	0.0000000
Std. Deviation	5.18621481
Absolute Difference	0.072
Positive Difference	0.053
Negative Difference	-0.072
Test Statistic	0.072
Asymp. Sig. (2-tailed)	0.200

The results indicate that the Asymp. Sig. (2-tailed) value is 0.200, which exceeds the significance threshold ( $\alpha = 0.05$ ). Consequently, the residuals in this study follow a normal distribution. This confirms that the assumption of normality is met, thereby justifying the application of parametric statistical techniques in subsequent analyses (Field, 2009).

**Homogeneity Test**

The homogeneity test was conducted to assess whether the variances across groups were equal, a crucial requirement for the validity of parametric statistical methods. This analysis was performed using Levene’s Test, and the results are presented in Table 6.

**Table 6. Homogeneity test results**

Variabel	Sum of Square	df	Mean Square	F	Sig. (p-value)
<b>Between Groups (Combined)</b>	1879.059	31	60.615	2.392	0.001
Linearity	939.324	1	939.324	37.070	0.000
Deviation from Linearity	939.734	30	31.324	1.236	0.233
Within Groups	1723.051	68	25.339		
Total	3603.110	99			

The results indicate that the significance value (p-value) from Levene's Test is 0.233, which is greater than the significance threshold ( $\alpha = 0.05$ ). Therefore, it can be concluded that the variances across groups are homogeneous. Given that the homogeneity assumption is satisfied, parametric statistical methods can be appropriately applied in this study (Field, 2009).

### Partial Analysis by Indicator

A partial analysis was conducted to evaluate the contribution of each indicator in Variable X (Hybrid Learning Infrastructure) and Variable Y (Learning Effectiveness). This analysis aimed to identify the most influential aspects in supporting the effectiveness of hybrid learning. The results of the partial test are presented in the following tables:

**Table 7. Partial test results of X variable**

Indicator	Mean
Laboratorium Hybrid Learning	4.08
Synchronous Learning	3.61
Asynchronous Learning	3.71

As shown in Table 7, the Hybrid Learning Laboratory indicator obtained the highest mean score of 4.08, indicating that laboratory facilities are crucial for enhancing the effectiveness of hybrid learning. In contrast, the Synchronous Learning indicator received the lowest score (3.61). This result may indicate

challenges related to student interaction, infrastructure limitations, or technical constraints. Meanwhile, the Asynchronous Learning indicator, with a score of 3.71, highlights the continued significance of flexible access to learning materials for students in hybrid learning environments.

**Table 8. Partial test results of Y variable**

Indicator	Mean
Quality of Learning	4.50
Suitability of Learning Levels	4.40
Incentive	4.47
Time	4.59

Regarding learning effectiveness (Variable Y), as presented in Table 8, the Time indicator obtained the highest score (4.59), indicating that students can effectively manage their study schedules in a hybrid learning environment. This suggests that time flexibility is a key factor in optimizing learning outcomes.

The Suitability of Learning Levels indicator received a score of 4.40. This suggests

that hybrid learning effectively adjusts the complexity of learning materials to meet students' needs, thereby fostering a more personalized and adaptive learning experience.

The Quality of Learning indicator, with a mean score of 4.50, is slightly lower than the time flexibility score. This suggests that while students perceive hybrid learning as supportive of their academic achievements, there remain

areas for improvement in material delivery and instructional strategies.

Lastly, the Incentive indicator scored 4.47, highlighting the role of external motivation and rewards in enhancing student engagement and participation in hybrid learning environments.

**Correlation Test**

The correlation test was conducted to examine the relationship between Hybrid Learning Infrastructure and Learning Effectiveness. The Pearson Product-Moment Correlation was employed, as it is suitable for analyzing relationships between two continuous variables under the assumption of normal data distribution (Field, 2009).

**Table 9. Correlation test results**

Correlations			
		Hybrid learning infrastructure	Learning effectiveness
Hybrid learning infrastructure	Pearson Correlation	1	.511**
	Sig. (2-tailed)		.000
	N	100	100
Learning effectiveness	Pearson Correlation	.511*	1
	Sig. (2-tailed)	.000	
	N	100	100

As shown in Table 9, the Pearson correlation coefficient ( $r$ ) is 0.511, with a  $p$ -value  $< 0.001$ . According to Sugiyono’s classification (2017), this indicates a moderate positive correlation between Hybrid Learning Infrastructure and Learning Effectiveness. The positive direction of the relationship suggests that enhancements in Hybrid Learning Infrastructure are associated with improvements in Learning Effectiveness.

Statistically, the significance value ( $p < 0.001$ ) is below the conventional threshold of  $\alpha = 0.05$ , leading to the rejection of the null hypothesis ( $H_0$ ) and the acceptance of the alternative hypothesis ( $H_1$ ). This result provides empirical support for the argument that a well-developed Hybrid Learning Infrastructure contributes significantly to the effectiveness of learning processes.

These findings underscore the importance of adequate technological and infrastructural support in hybrid learning environments, further reinforcing the necessity of continuous investment in digital learning resources, internet connectivity, and learning management systems to optimize student engagement and learning outcomes.

**DISCUSSION**

**Hybrid Learning Infrastructure**

The findings of this study emphasize the critical role of Hybrid Learning Infrastructure in enhancing learning effectiveness. The high score obtained for the Hybrid Learning Laboratory indicator highlights the importance of well-developed physical infrastructure, including stable internet connectivity, high-quality digital tools, and interactive learning spaces. These components are essential in ensuring the success of hybrid learning environments. Conversely, the lower score for the Synchronous Learning indicator suggests a need to improve the technological competencies of both students and educators to ensure more effective utilization of digital learning facilities.

These findings align with previous research by Aristika et al. (2021), which confirms that well-integrated technology in hybrid learning models enhances the interactive and communicative aspects of the learning process. Furthermore, this study supports the Technology Acceptance Model (Davis, 1989), which suggests that perceived ease of use and perceived usefulness are the primary

determinants of technology acceptance in educational settings.

Additionally, the results are consistent with existing literature emphasizing the role of technology as a fundamental component of 21st-century education. Beyond improving learning efficiency, digital tools facilitate a more personalized and flexible learning experience tailored to students' individual needs. However, the success of hybrid learning is not solely dependent on infrastructure availability. It also requires the readiness of educators and students to optimize technological resources effectively (Gopo, 2022).

Therefore, an effective hybrid learning implementation strategy must incorporate infrastructure enhancement, digital competency development, and continuous pedagogical innovation to ensure long-term sustainability. By adopting a comprehensive approach that integrates investment in technology, lecturers and students, and adaptive learning design, educational institutions can foster a more effective and resilient hybrid learning in the digital era.

### **Learning Effectiveness**

The effectiveness of hybrid learning extends beyond the mere transmission of knowledge. It is fundamentally shaped by the dynamic interactions between educators, students, and the learning environment (Suardi, 2018). The findings of this study indicate that the time indicator achieved the highest mean score, suggesting that hybrid learning enables students to regulate their study schedules independently. This flexibility fosters self-regulated learning development, where students gain greater control over their learning strategies and self-evaluation processes (Fitriyana et al., 2021). Furthermore, the ability to access learning materials flexibly further enables personalized learning experiences that align with individual needs.

Additionally, the high scores observed for the *quality of learning* and *suitability of learning level* indicators suggest that hybrid learning effectively accommodates students' academic requirements in an adaptive manner. Nevertheless, hybrid learning effectiveness is influenced not only by the quality of instructional materials and technological infrastructure but also by social interaction. Empirical studies suggest that students who actively engage with educators and peers exhibit higher levels of affective engagement, leading to a more immersive and meaningful learning experience (Raes, 2022).

In contrast, the incentive indicator received a relatively lower score, suggesting that external motivation mechanisms within hybrid learning environments require further refinement. Ryan & Deci (2020) highlights the significance of extrinsic motivation, such as academic rewards and formal recognition of active participation, in fostering students' sense of competence and engagement. Therefore, enhancing incentive strategies through structured rewards or formal recognition can sustain motivation and encourage consistent participation in hybrid learning.

These findings highlight that hybrid learning effectiveness is not solely contingent on technological advancements, but also on pedagogical frameworks that integrate flexibility, interaction, and incentives to enhance student engagement and motivation. Moreover, student-educator interactions enhance comprehension and reflective learning, aligning with social constructivism, which emphasizes knowledge as a socially mediated process (Vygotsky, 1978).

### **The Relationship between Hybrid Learning Infrastructure and Learning Effectiveness**

The correlation test results indicate a significant positive relationship between hybrid learning infrastructure and learning effectiveness, with a correlation coefficient of  $r = 0.511$  ( $p < 0.05$ ), indicating a moderate

relationship (Sugiyono, 2017). This suggests that higher-quality hybrid learning infrastructure corresponds to greater perceived learning effectiveness among students. However, as the correlation falls within the moderate range, other factors such as student readiness, teaching methodologies, and learning motivation also contribute to learning effectiveness.

Further analysis indicates that the mere availability of hybrid learning tools does not guarantee effectiveness. It depends on how educators and students utilize them. Additionally, optimal pedagogical support and institutional roles in training and competency development are key factors in enhancing hybrid learning effectiveness. Studies have also revealed that technology adoption in hybrid learning requires an interactive approach that considers users' specific needs and adequate institutional support (Baker & Spencely, 2023; Gultom et al., 2022; Puthiya et al., 2023).

These findings imply that enhancing hybrid learning infrastructure must be complemented by innovative and participatory teaching strategies. In addition to providing adequate infrastructure, educational institutions must ensure that both faculty and students are adequately prepared to optimize technology through continuous training. Interactive learning models, such as project-based learning and the integration of dynamic Learning Management Systems (LMS), can enhance hybrid learning effectiveness. According to Husnul & Suharyadi (2021) effective LMS utilization involves not only content delivery but also structured planning, supervision, and evaluation to foster student engagement and learning outcomes.

Beyond internal institutional factors, the successful implementation of hybrid learning also requires educational policy support focused on strengthening digital infrastructure and developing evaluation strategies that more accurately measure learning effectiveness.

Therefore, while facilities and infrastructure play a crucial role, the success of hybrid learning ultimately depends on the readiness and adaptability of both students and educators.

### **Policy Implications for Hybrid Learning Development**

The sustainability of hybrid learning is contingent upon robust digital infrastructure, educators' competence, and students' digital literacy (Mafaakhir & Muhlisin, 2024). Without well-defined policies, hybrid learning risks becoming a short-term solution with minimal long-term impact on higher education. Fabian et al. (2024) highlight that in the post-pandemic era, hybrid learning must be more flexible and adaptive to enhance student engagement. Hence, sustained investment and adaptive policies are critical to ensuring its long-term efficacy.

This study offers several policy recommendations to enhance hybrid learning effectiveness:

1. **Investment in digital infrastructure**  
Educational institutions and governments must ensure stable internet access, adequate technological resources, and an optimized Learning Management System (LMS) to support both online and offline learning seamlessly.
2. **Continuous educator training**  
Hybrid learning success hinges on educators' preparedness. Regular training programs should encompass both technical proficiency and innovative pedagogical strategies to foster effective interaction.
3. **Enhancing students' digital literacy**  
Students must acquire essential digital competencies to facilitate independent learning. Orientation programs, technical workshops, and curriculum-integrated digital skills training are crucial steps to enhance their readiness.
4. **Curriculum evaluation and adaptation**  
Periodic curriculum assessments are essential to align hybrid learning with

technological advancements and student needs. A flexible and adaptive curriculum ensures sustained effectiveness.

#### 5. Strengthening educational policies

Governments and institutions should establish national hybrid learning standards, integrate technology into pedagogy, and provide financial support for universities to cultivate an inclusive and sustainable digital learning.

With strategic policy frameworks and robust institutional support, hybrid learning can be established as a sustainable and integral model in higher education.

### CONCLUSION

Hybrid learning is not merely the adoption of technology but a transformative strategy that ensures the sustainability of education in the digital era. This study reaffirms that the effectiveness of hybrid learning is largely contingent upon the availability and quality of infrastructure, including hybrid learning laboratories, stable digital infrastructure, and flexible scheduling, all of which enhance student engagement and learning experiences. The findings indicate that higher-quality facilities and infrastructure correlate with increased learning effectiveness within hybrid models.

Despite its numerous advantages, the implementation of hybrid learning faces persistent challenges, particularly in optimizing synchronous learning and establishing effective incentive systems for educators. Thus, the success of this model is not solely determined by technological availability but also by the preparedness of the academic community to adapt and leverage digital tools effectively. The competence of educators, students' digital literacy, and well-designed education policies are critical in ensuring that hybrid learning evolves from a temporary adaptation into a fundamental paradigm in higher education.

To maintain its relevance amid ongoing technological advancements and shifting student needs, hybrid learning must undergo continuous evaluation and refinement. By adopting a holistic approach that integrates technology, pedagogy, and adaptive learning strategies, hybrid learning can serve not only as a response to modern educational challenges but also as a catalyst for a more inclusive, flexible, and sustainable learning

### REFERENCES

- Aristika, A., Darhim, Juandi, D., & Kusnandi. (2021). The Effectiveness of Hybrid Learning in Improving of Teacher-Student Relationship in Terms of Learning Motivation. *Emerging Science Journal*, 5(4), 443–456. <https://doi.org/10.28991/esj-2021-01288>
- Baker, L. A., & Spencely, C. (2023). Is Hybrid Teaching Delivering Equivalent Learning for Students in Higher Education. *Journal of Further and Higher Education*, 47(5), 674–686. <https://doi.org/10.1080/0309877X.2023.2183357>
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Fifth Edition). Sage Publications.
- Davis, F. D. (1989). Perceived usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly: Management Information Systems*, 13(3), 319–339. <https://doi.org/10.2307/249008>
- Dewantara, J. A., & Nurgiansah, T. H. (2020). Efektivitas Pembelajaran Daring di Masa Pandemi COVID 19 Bagi Mahasiswa Universitas PGRI Yogyakarta. *Jurnal Basicedu*, 5(1), 367–375.

- <https://doi.org/10.31004/basicedu.v5i1.669>
- Fabian, K., Smith, S., & Taylor-Smith, E. (2024). Being in Two Places at the Same Time: a Future for Hybrid Learning Based on Student Preferences. *TechTrends*, 68(4), 693–704. <https://doi.org/10.1007/s11528-024-00974-x>
- Field, A. (2009). *Discovering Statistics Using SPSS* (Third Edition). SAGE Publications.
- Fitriyana, N., Wiyarsi, A., Sugiyarto, K. H., & Ikhsan, J. (2021). The Influences of Hybrid Learning with Video Conference and “Chemondro-Game” on Students’ Self-Efficacy, Self-Regulated Learning, and Achievement toward Chemistry. *Journal of Turkish Science Education*, 18(2), 233–248. <https://doi.org/10.36681/tused.2021.62>
- Gopo, C. (2022). The Role of Technology in the 21st Century Education of Learners. *The Official Research Journal of Tagum City Division*, 47–58. <https://www.researchgate.net/publication/359849731>
- Gultom, J. R., Sundara, D., & Fatwara, M. D. (2022). Pembelajaran Hybrid Learning Model sebagai Strategi Optimalisasi Sistem Pembelajaran di Era Pandemi Covid-19 pada Perguruan Tinggi di Jakarta. *Mediastima*, 28(1), 11–22. <https://doi.org/10.55122/mediastima.v28i1.385>
- Husnul, N. R. I., & Suharyadi, A. (2021). Strategi Dosen dalam Manajemen E-Learning Guna Meningkatkan Hasil Belajar Mahasiswa di Perguruan Tinggi. *Kelola: Jurnal Manajemen Pendidikan*, 1, 34–48.
- Mafaakhir, A., & Muhlisin. (2024). Analisis Implementasi Kebijakan Hybrid Learning pada Program Studi Magister Pendidikan Agama Islam Pascasarjana UIN Gusdur Pekalongan. *Indonesian Research Journal on Education*, 4(2).
- Ministry of Education. (2021). Implementation of Face-to-Face Learning for the 2021/2022 Academic Year. In 2021.
- Nasution, N., Jalinus, N., & Syahril. (2019). *Blended Learning* (Edisi Pertama). Unilak Press.
- Nunnally, J., & Bernstein, I. (1994). *Psychometric Theory* (Third Edition). McGraw-Hill.
- Puthiya, R., Anderson, P., Fonseca, C., & Hyland, L. (2023). Technology Adoption in a Hybrid Learning Environment: An Action Research Study among University Faculty in the UAE. *Interactive Learning Environments*, 32(10), 6833–6844. <https://doi.org/10.1080/10494820.2023.2290020>
- Raes, A. (2022). Exploring Student and Teacher Experiences in Hybrid Learning Environments: Does Presence Matter? *Postdigital Science and Education*, 4(1), 138–159. <https://doi.org/10.1007/s42438-021-00274-0>
- Rahayu, A. D., & Haq, M. S. (2021). Sarana dan Prasarana dalam Mendukung Pembelajaran Daring pada Masa Pandemi Covid-19. *Jurnal Inspirasi Manajemen Pendidikan*, 1.
- 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.

<https://doi.org/https://doi.org/10.1016/j.cedpsych.2020.101860>

*Pendidikan*, 3(2), 241–255.  
<https://doi.org/10.37329/cetta.v3i2.452>

Suardi, M. (2018). *Belajar dan Pembelajaran* (Cetakan Pertama). Deepublish.

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.

Sugiyono. (2017). *Statistika untuk Penelitian*. Alfabeta.

Zainudin, Wijayanti, R., & Faulina, R. (2021). Efektivitas Pembelajaran Hiybrid Learning Masa Pandemi Covid-19 Pada Mata kuliah IPA Kelas Rendah. *Jurnal IPA & Pembelajaran IPA*, 5(3), 242–249.

Sugiyono. (2018). *Metodologi Penelitian Kuantitatif*. Alfabeta.

<https://doi.org/10.24815/jipi.v5i3.22029>

Suni Astini, N. K. (2020). Tantangan dan Peluang Pemanfaatan Teknologi Informasi Dalam Pembelajaran Online Masa Covid-19. *Cetta: Jurnal Ilmu*