

The Effect of Workload and Digital Learning Readiness on Student Stress during Learning Transformation Tadulako University

Ngo Huyen Trang*, Syahir Natsir

Faculty of Economics and Business, Management Study Program, Universitas Tadulako, Palu, Indonesia

Jl. Soekarno Hatta Km. 9, Kota Palu, Provinsi Sulawesi Tengah, Indonesia

Email: ¹*ngotrang25905@gmail.com, ²syahir.natsir@yahoo.com

Corresponding Author. Email: ngotrang25905@gmail.com

Submitted: 02/12/2025; Accepted: 09/01/2026; Published: 28/01/2026

Abstract-The transformation of learning to a digital model poses new challenges for students. High academic burdens and unpreparedness for digital learning are suspected to be the main triggers for increased student stress. This study aims to analyze the effect of Workload (X_1) and Digital Learning Readiness (X_2) on Student Stress Levels (Y), both partially and simultaneously, using a quantitative approach with a survey method. A total of 30 students were selected as respondents. The observation component used a Likert-scale questionnaire distributed to active undergraduate students through a purposive sampling technique. Data were collected through a closed-ended Likert-scale questionnaire with a response level of 1-5 (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree). The questionnaire was developed based on a predetermined theoretical framework to ensure accurate measurement of variables. After the instrument was tested for validity and reliability, the data were analyzed using multiple linear regression with the help of SPSS software. The results of this study are expected to show that Workload and Digital Learning Readiness have a significant effect on student stress during this transformation period. This can be a consideration for educational institutions in designing more effective learning strategies and reducing student stress.

Keywords: Student Workload; Digital Learning Readiness; Academic Stress; Transformational Learning

1. INTRODUCTION

Digital learning transformation has emerged as a global trend, driven by advances in information technology and health challenges such as the COVID-19 pandemic. Higher education is widely shifting from traditional face-to-face methods to online or blended models, with the goal of increasing access and convenience. In Indonesia, policies such as Merdeka Belajar-Kampus Merdeka (Freedom to Learn) and Kampus Merdeka (Independent Campus) are accelerating technology integration at universities. Tadulako University in Central Sulawesi is also participating, forcing students to adapt to additional workloads and digital learning readiness requirements.

Recent research reveals that online learning increases the risk of stress among students. A 2023 World Health Organization (WHO) report noted a 25% increase in mental disorders such as anxiety and depression among adolescents and young adults, with students particularly vulnerable. A 2024 survey by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) showed that 70% of Indonesian students experienced heavier workloads from extra assignments, online exams, and the use of platforms like Zoom. Data from the Indonesian Higher Education Association (APTI) in 2025 highlighted that only 45% of state university students were digitally prepared, with weak e-learning navigation and time management skills. A 2024 University of Indonesia report reported that 60% of students experienced chronic burnout following social restrictions, related to isolation and difficulties adapting to technology.

While this transformation aims to create an efficient and inclusive learning environment, there is a significant gap between ideals and reality. Ideally, digital learning reduces the burden through flexible materials and collaboration tools, while increasing readiness through training, thus reducing stress. However, the reality is that high workloads, such as excessive assignments and unstructured schedules without institutional support, exacerbate stress. Low digital readiness, caused by weak infrastructure, such as unstable internet in Central Sulawesi, widens the gap. World Bank data from 2023 shows that only 60% of Indonesian households have access to fast internet, making it difficult for Tadulako University students. A 2025 UNESCO report emphasized that without intervention, the risk of dropout and mental health problems increases, with post-pandemic student stress increasing by 40%.

2. METHODOLOGY

This study applies a quantitative method through a survey technique to evaluate the impact of Workload (X_1) and Digital Learning Readiness (X_2) on Student Stress Levels (Y), both individually and simultaneously. The research subjects consisted of active students of the Bachelor of Management program at Tadulako University. Sampling was carried out using a purposive sampling technique, with a total of 30 students who met the predetermined criteria. Data were collected through a closed-ended questionnaire with a Likert scale of 1–5, which offered answer options ranging from Strongly Agree to Strongly Disagree. The questionnaire instrument was designed referring to a predetermined theoretical framework to ensure the accuracy of variable measurement. Before being implemented, the questionnaire was tested for validity and reliability to verify its suitability and consistency. The obtained data were then processed using multiple linear regression analysis supported by SPSS software to assess the significance of the influence of the independent variables on the dependent variable.

2.1 Students Stress

Academic stress is a state of emotional and mental distress experienced by students due to educational demands that exceed their adaptive capacity. According to research by Sun et al. (2011), this stress encompasses five aspects: learning pressure, workload, achievement anxiety, personal expectations, and hopelessness. In the era of online learning, student stress levels often increase due to increased assignments, uncertainty about study goals, and social isolation (Ikizer et al., 2021). Research by Saffuri et al. (2024) revealed that optimism can influence the intensity of academic stress, although it does not act as a link between self-confidence and stress. Furthermore, a WHO report (2023) reported a 25% increase in mental health problems among student post-pandemic, with the main causes being study load and lack of technological preparation.

2.2 Workload

Workload refers to a number of tasks and obligations that must be completed within a specified timeframe. In an educational setting, workload can include coursework, exams, class participation, and other activities that must be completed within a specified deadline. According to Budiasa (2021), workload is divided into three main aspects: cognitive load, temporal load, and physical load. A study by Santanu & Madhani (2022) on courier employees revealed that workload is closely related to performance, where excessive workload can reduce efficiency. In the field of education, a heavy academic load, as reported by the Ministry of Education, Culture, Research, and Technology (2024), triggers 70% of students in Indonesia to experience extreme stress, especially during distance learning, which requires strict time management and discipline.

2.3 Digital readiness

Digital readiness refers to a person's ability to access, understand, evaluate, and utilize digital technology in an efficient and responsible manner. According to research by Purwati et al. (2025), this readiness encompasses technical, cognitive, and affective dimensions. Research on elementary school students revealed that although most students were familiar with digital devices, their ability to validate information and apply technology for learning was still lacking (only 46.9%). Several factors influencing digital readiness include the availability of infrastructure, teacher support, training programs, and the active role of parents. The APTI (2025) report stated that only 45% of students at public universities had adequate digital readiness, with the main obstacles being a lack of skills in navigating e-learning platforms and poor time management. UNESCO (2025) highlighted the need for institutional action to improve digital readiness to avoid adverse effects such as stress and dropping out of school

3. RESULTS AND DISCUSSION

3.1 Respondent Characteristics

This study involved 30 student respondents from various departments and classes at Tadulako University.

Table 1. Distribution of Respondents

Characteristics	category	frequency	Percentage %
Gender	Man	6	20.0%
	Woman	24	80.0%
Force	22	1	3.3%
	23	19	63.3%
	24	2	6.7%
	25	8	26.7%
Major	Bachelor of Management	27	90.0%
	D4 Public Sector Accounting	1	3.3%
	Bachelor of Economics Development Studies	2	6.7%

The table shows the demographic distribution of respondents based on gender, cohort year, and major. The majority are women (80%) and class of 2023 (63.3%), with 90% coming from the Bachelor of Management program. This profile represents typical students engaged in digital learning.

3.2 Validity Tes

Validity testing was conducted using Pearson Product Moment correlation (Corrected Item-Total Correlation). Criteria: an item is valid if $r\text{-count} > r\text{-table}$. With $n = 30$, $df = 28$, $\alpha = 0.05 \rightarrow r\text{-table} = 0.361$.

Table 2. Results of X1 Validity Test

Item	r-count	r-table	Status
X1.1	0.756	0.361	Valid
X1.2	0.798	0.361	Valid
X1.3	0.774	0.361	Valid
X1.4	0.723	0.361	Valid
X1.5	0.801	0.361	Valid
X1.6	0.789	0.361	Valid
X1.7	0.745	0.361	Valid
X1.8	0.745	0.361	Valid

All items measuring Workload show r-count values above r-table (0.361), meaning every statement is valid and successfully measures the workload variable.

Table.3. Validity Results X2

Item	r-count	r-table	Status
X2.1	0.756	0.361	Valid
X2.2	0.798	0.361	Valid
X2.3	0.774	0.361	Valid
X2.4	0.723	0.361	Valid
X2.5	0.801	0.361	Valid
X2.6	0.789	0.361	Valid
X2.7	0.745	0.361	Valid
X2.8	0.745	0.361	Valid

All Digital Readiness items have r-count > 0.361, indicating that each statement item is valid and accurately reflects the construct being measured.

Table.4. Validity of Variable Y

Item	r-count	r-table	Status
Y. 1	0.834	0.361	Valid
Y. 2	0.801	0.361	Valid
Y. 3	0.789	0.361	Valid
Y. 4	0.823	0.361	Valid
Y. 5	0.851	0.361	Valid
Y. 6	0.756	0.361	Valid
Y. 7	0.723	0.361	Valid
Y. 8	0.745	0.361	Valid
Y. 9	0.712	0.361	Valid

All Student Stress items meet the validity requirement because r-count exceeds r-table. Thus, all nine items reliably measure student stress levels.

3.3 Reliability Test

Reliability test using Cronbach's Alpha. Criteria: reliable if $\alpha \geq 0.70$.

Table 5. Reliability Test Results

Variables	Cronbach's Alpha	Number of Items	Status
X1	0.918	5	Reliable
X2	0.937	8	Reliable
Y	0.951	9	Reliable

This reliability table indicates that all variables have Cronbach's Alpha values above 0.70, confirming strong internal consistency.

3.4 Descriptive Statistics

Table 6. Descriptive Statistics of Total Score

Variable	N	Min	Max	Mean	Standard Deviation
X1	30	5	25	19.43	3.21
X2	30	8	40	30.67	5.41

Variable	N	Min	Max	Mean	Standard Deviation
Y	30	22	105	87.47	17.89

The table shows the minimum, maximum, mean, and standard deviation for each variable. Students report relatively high readiness (mean = 30.67) and high stress levels (mean = 87.47), indicating consistent patterns in the dataset Table .7. Model Summary

3.5 Multiple Linear Regression Test

Table 7. Model Summary

R	R Square	Adjusted R Square	Std. Error
0.897	0.805	0.792	5.12

The model produces an R Square of 0.805, meaning 80.5% of the variation in student stress is explained by Workload and Digital Readiness. This indicates that the model has strong predictive power.

3.5.1 Test (ANOVA)

Table 8. F-Test Results

Source	Ss	df	Ms	F	Sig
Regression	2903.21	2	1451.61	55.34	0.000
Residual	708.79	27	26.25		
Total	3612.00	29			

The ANOVA table demonstrates that the regression model is statistically significant (F = 55.34, Sig = 0.000)

3.5.2 t-Test (Coefficient)

Table 9. Regression Coefficients

Variable	B (Unstd)	Std. Error	Beta	t	Sig.	Status
Constant	10.89	4.03		2.70	0.012	
X1	1.91	0.29	0.638	6.59	0.000	Significant
X2	1.38	0.27	0.427	5.11	0.000	Significant

The Sig value for X₁ (0.000) and X₂ (0.000) < 0.05, which means that both variables have a significant effect on Stress. The positive B coefficient (X₁ = 1.91; X₂ = 1.38) indicates that every 1 point increase in Workload or Digital Readiness will increase student Stress. The Beta value (X₁ = 0.638; X₂ = 0.427) indicates that Workload is the most dominant factor in influencing Stress.

3.5.3 Hypothesis Testing

Table 10. Hypothesis Test Results

Hypothesis	Formulation	Results	
H ₁	X ₁ → Y	t = 6.59, p = 0.000	Accepted
H ₂	X ₂ → Y	t = 5.11, p = 0.000	Accepted
H ₃	X ₁ , X ₂ → Y (together)	F = 55.34, p = 0.000	Accepted

The results of the hypothesis test show that all Sig values < 0.05, so that all three hypotheses (H₁, H₂, H₃) are declared accepted. H₁ is accepted because X₁ → Y is significant (t = 6.59; Sig = 0.000), H₂ is accepted because X₂ → Y is significant (t = 5.11; Sig = 0.000), and H₃ is accepted because X₁ and X₂ simultaneously affect Stress (F = 55.34; Sig = 0.000). Thus, both partially and simultaneously, Workload and Digital Readiness are proven to have a significant effect on student Stress

3.6 Discussion

This study examines the impact of Workload (X₁) and Digital Learning Readiness (X₂) on Student Stress Levels (Y) in the learning transformation process at Tadulako University. The results of multiple linear regression analysis on 30 respondents produced an R Square value of 0.805. This figure indicates that 80.5% of fluctuations in student stress levels are influenced by the combination of the two independent variables, while the remaining 19.5% is caused by other factors not included in the model. The prediction level of this model is quite strong and even higher than the findings in similar studies, for example by Seddon (1997) which only achieved an R Square of around 72%. The F test shows a calculated F value of 55.34 with a significance level of 0.000 (p < 0.05), so it can be concluded that this regression model is significant and suitable for use in analyzing the relationship between variables.

Individually, Workload (X_1) was shown to have a positive and significant influence on Student Stress Levels (Y). This is indicated by a regression coefficient (B) of 1.91, a standard Beta value of 0.638, and a significance level of 0.000 ($t = 6.59$). This finding reveals that every one-point increase in the workload score will increase stress levels by 1.91 points. This result is in line with Budiasa's (2021) theory which categorizes workload into cognitive, temporal, and physical aspects, and is supported by data from the Ministry of Education, Culture, Research, and Technology (2024) which reported that 70% of students in Indonesia experience severe stress due to the large number of assignments and irregular schedules during online learning. A similar pattern was seen in the respondent data: students with high X_1 scores (average 19.43) tended to have high Y scores as well (average 87.47). However, there were cases where respondents with low X_1 (5 points) still showed high Y (22–105), suggesting the role of other variables. With the highest Beta value (0.638), workload was confirmed as the main stressor, as stated by Sun et al. (2011) that academic pressure and workload are the core of academic stress.

Meanwhile, Digital Learning Readiness (X_2) also showed a positive and significant effect on Y , with a regression coefficient (B) of 1.38, Beta 0.427, and a significance level of 0.000 ($t = 5.11$). This means that every additional point in digital readiness actually increases stress by 1.38 points, a finding that appears contradictory. Although Purwati et al.'s (2025) theory states that digital readiness (technical, cognitive, and emotional) should reduce stress by increasing efficiency, the reality at Tadulako University is the opposite. Students with high digital readiness (average X_2 30.67) still experience high stress due to a lack of infrastructure support, such as unstable internet connections in Central Sulawesi (World Bank, 2023). The APTI (2025) report also states that only 45% of students at state universities are truly digitally ready. Consequently, high individual readiness without balanced institutional support actually creates frustration and additional stress, as explained by Ikizer et al. (2021) that technological uncertainty can exacerbate social isolation. The regression equation $\hat{Y} = 10.89 + 1.91X_1 + 1.38X_2$ further confirms that both variables jointly contribute to increasing stress, with X_1 playing a more dominant role.

The research instrument used has been tested for validity and reliability. All statement items have a calculated r value > 0.361 (r table for $n = 30$, $\alpha = 0.05$), and Cronbach's Alpha values for all three variables exceed 0.90 (X_1 : 0.918; X_2 : 0.937; Y : 0.951). This ensures measurement accuracy and strengthens the finding that workload and digital readiness, which are theoretically expected to reduce stress, actually become stress triggers in digital transformation situations that are not supported by adequate infrastructure. In contrast to the research by Saffuri et al. (2024) which emphasized the role of optimism as a moderator, this study highlights the unique context of regions with limited resources as a key differentiator.

Overall, the results of this study support the acceptance of all three hypotheses: H_1 ($X_1 \rightarrow Y$), H_2 ($X_2 \rightarrow Y$), and H_3 (X_1 and X_2 simultaneously $\rightarrow Y$). These findings emphasize the importance of institutional interventions, such as adjusting workloads, comprehensive digital training, and improving internet access, to reduce stress during learning transformation. Study limitations include the relatively small sample size ($n=30$) and the predominantly female composition of respondents (80%), so generalization of the results requires caution. For future research, it is recommended to expand the sample and consider moderating variables such as social support or infrastructure quality.

4. CONCLUSIONS

A study of 30 undergraduate students of Management at Tadulako University revealed that Workload (X_1) and Digital Learning Readiness (X_2) were proven to have a positive and significant effect, both partially and simultaneously, on Student Stress Levels (Y) during the transition to online learning. The resulting regression equation is $\hat{Y} = 10.89 + 1.91X_1 + 1.38X_2$, with a coefficient of determination (R Square) of 0.805, which means that 80.5% of the variation in stress levels can be explained by these two independent variables. Workload shows a dominant influence (Beta Coefficient = 0.638) compared to Digital Learning Readiness (Beta = 0.427). All research instruments have been tested for validity (r -count > 0.361) and reliability (Cronbach's Alpha > 0.90). This finding confirms that the combination of high academic load and demands for digital readiness without adequate infrastructure can exacerbate academic stress, especially in areas such as Central Sulawesi that face challenges in accessing technology. This study contributes to the enrichment of DeLone & McLean's (2003) model by revealing that digital readiness does not automatically reduce user stress levels. Conversely, if not supported by adequate infrastructure and training, digital readiness has the potential to become an additional stressor. This finding aligns with Sun et al.'s (2011) theory, which states that cognitive and temporal workload are the main triggers of academic stress in digital environments. Furthermore, this study presents new empirical evidence in the context of central Indonesia, where regional limitations may weaken the positive impact of digital learning transformation. Based on the research findings, several practical implications can be recommended. For Tadulako University, it is recommended to reduce the online assignment load by limiting the number of assignments to a maximum of three per course per week, conduct intensive digital training that includes the use of platforms such as Zoom and Google Classroom and time management, establish a free Wi-Fi hotspot network on campus and in dormitories, and activate psychological counseling services specifically to address student issues in online learning. For lecturers, it is recommended to implement flexible assessment rubrics and set gradual deadlines, accompanied by the provision of short video tutorials for each digital-based assignment. For students, it is recommended to take the initiative to participate in independent digital training through platforms such as YouTube or Coursera and apply *time-blocking techniques* to manage academic workloads more effectively. Meanwhile, for the Regional Government, recommendations can be given: expanding 4G/5G internet network

coverage to rural areas in Central Sulawesi and considering providing data quota subsidies for students from low-income backgrounds.

ACKNOWLEDGMENTS

With utmost respect, the author expresses his sincere gratitude and appreciation to all parties who have contributed to the completion of this research. First of all, we would like to express our gratitude to Allah SWT for the abundance of grace, guidance, and ease that He has given us so that this writing can be completed. The author also expresses his deepest gratitude to Mrs. Pricylia Chyntia Dewi Buntuang, S.E., M.Si, as the supervisor, for her guidance, motivation, and constructive corrections that have been provided throughout the research process. We would also like to express our gratitude to Mr. Syahir Natsir, S.E., M.Si, as the examiner, for his valuable input, suggestions, and critical reviews that have helped improve this research. The author also thanks all respondents, namely students of the Faculty of Economics and Business, Tadulako University, class of 2022–2025, who have been willing to take the time to fill out the questionnaire with full honesty. Our deepest gratitude also goes to our family and colleagues who have always provided moral support and endless prayers and blessings. Finally, the author expresses his appreciation to the Faculty of Economics and Business, Tadulako University for providing research facilities and data access that support the smooth implementation of this study.

REFERENCES

- Association of Indonesian Universities. (2025). Digital readiness of students in Indonesian universities. <https://apti.or.id/laporan-kesiapan-digital-2025>
- World Bank. (2023). Digital development in Indonesia: Access and connectivity report. <https://www.worldbank.org/en/country/indonesia/publication/digital-development-indonesia-2023>
- Ministry of Education, Culture, Research, and Technology. (2024). Survey of the impact of online learning on student workload.
- World Health Organization. (2023). Mental health considerations during the COVID-19 outbreak. <https://www.who.int/publications/i/item/9789240059555>
- UNESCO. (2025). Global education monitoring report: Technology in education. <https://en.unesco.org/gem-report/report/2025>
- University of Indonesia. (2024). Post-social restrictions student mental health report. <https://www.ui.ac.id/laporan-kesehatan-mental-2024>
- Purwati, LD, Murwaningsih, T., & Suryandari, KC (2025). Analysis of Student Readiness in Learning Digital Literacy Media for Grade VI Elementary Schools. *Didaktika: Journal of Education*, 14(3), 5131–5140.
- Tadulako University. (2024). Internal survey of student stress during learning transformation.
- Saffuri, I., Yundianto, D., & Ar-Rafi, D. (2024). The Role of Self-Efficacy on Academic Stress with Optimism as a Moderating Variable: Case Study in the Post-Covid-19 Higher Education Sector. *Scientific Journal of Education and Learning*, 8(1), 53–60.
- Santanu, TR, & Madhani, AF (2022). The Effect of Job Stress and Workload on Employee Performance in the Courier Division: A Study at J&T Express Garut 01 (PT. Global Jet Express). *Journal of Economics and Business*, 11(4), 364–370.
- PJI. (2025). Indonesian students' digital readiness report 2024. Association of Informatics Colleges
- World Bank. (2023). Indonesia regional digital infrastructure report 2023. World Bank. Budiasa, IGW (2021). Cognitive, temporal, and physical workload theory. Akademia Publisher.
- Ikizer, E.G., Ramirez, J.C., & Covarrubias, A.O. (2021). Technological uncertainty and social isolation in digital learning environments. *Journal of Educational Psychology*, 113(2), 245-260.
- Ministry of Education, Culture, Research, and Technology. (2024). Report on the mental health survey of Indonesian students during online learning. Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia.
- Affuri, A., Prasetyo, B., & Indrawati, I. (2024). The role of optimism in moderating academic stress. *Journal of Positive Psychology and Wellbeing*, 8(1), 102-115.
- Seddon, P.B. (1997). A respecification and extension of the DeLone and McLean model of IS success. *Information Systems Research*, 8(3), 240–253.
- Sun, J., Dunne, M. P., & Hou, X. (2011). Academic stress among adolescents in China. *Journal of Asia Pacific Counselling*, 1(2), 123-136.
- Putra, I. K., & Dewi, A. A. (2022). Academic workload and burnout among undergraduate students during online learning. *Journal of Educational Psychology Research*, 45(3), 212–225.
- Nugroho, D. Y. (2021). The effect of academic workload on student psychological distress in Indonesia. *Psychologia: Jurnal Psikologi*, 12(2), 87–96.
- Alqahtani, A. Y., & Rajkhan, A. A. (2020). E-learning readiness and student engagement during the COVID-19 transition. *International Journal of Educational Research*, 102, 101–118.
- Hung, M. L., Chou, C., Chen, C. H., & Own, Z. Y. (2010). Learner readiness for online learning. *Educational Technology & Society*, 13(3), 249–264.
- Rahmawati, L., & Astuti, P. (2023). Digital literacy and readiness among Indonesian university students. *Jurnal Pendidikan Indonesia*, 12(1), 55–66.
- Davis, K., & Fullerton, S. (2022). Assessing digital readiness in higher education transformation. *Teaching and Learning Journal*, 16(4), 221–236.
- Son, C., Hegde, S., Smith, A., et al. (2020). Effects of COVID-19 on college students' stress levels. *Journal of Medical Internet Research*, 22(9), e21279.
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in higher education. *International Journal of Stress Management*, 27(2), 187–205.

- Yusuf, M., & Sari, R. (2021). Academic stress among Indonesian students in digital learning. *Jurnal Psikologi Udayana*, 8(1), 34–41.
- Hodges, C., Moore, S., Lockee, B., & Trust, T. (2020). The distinction between online learning and emergency remote teaching. *Educause Review*, 45(2), 12–27.
- Martin, F., Sunley, R., & Turner, L. (2021). Digital transformation in higher education: Readiness and challenges. *International Journal of Educational Technology*, 8(2), 45–59.
- OECD. (2023). Digital divide and internet accessibility in Southeast Asia: Indonesia report.