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Dimensions underlying academic procrastination among university students: An exploratory factor analysis and intervention implications

Merina Pratiwi[1], Amiroel Oemara Syarief[2]
[1]Informatics, Institut Teknologi dan Bisnis Riau Pesisir, Dumai, Indonesia
[2]Industrial Engineering, Institut Teknologi dan Bisnis Riau Pesisir, Dumai, Indonesia

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ABSTRACT

Academic procrastination is a persistent problem among university students and negatively affects academic performance and timely study completion. This phenomenon is closely related to students' ability to manage time, regulate academic behavior, and respond to environmental and technological demands. However, empirical evidence on the underlying factor structure of academic procrastination in local higher education contexts remains limited. This study aims to identify the latent factor structure of academic procrastination using Exploratory Factor Analysis (EFA). A quantitative design was employed by administering a 20-item academic procrastination questionnaire to undergraduate students. Data were analyzed using Principal Axis Factoring with Promax rotation. Data suitability was confirmed by a Kaiser–Meyer–Olkin value of 0.902 and a significant Bartlett's Test of Sphericity. The EFA results revealed two dominant factors: time management and academic self-regulation, and environmental and technology-related distractions. These findings provide empirical evidence on the dominant dimensions of academic procrastination and support the development of targeted institutional interventions in higher education.

Corresponding Author:

Merina Pratiwi,
Informatics,
Institut Teknologi dan Bisnis Riau Pesisir,
Jl. Utama Karya, Dumai Timur, 28811, Indonesia
Email: merinapratiwi1920@gmail.com

INTRODUCTION

Academic procrastination is a prevalent phenomenon in higher education and has been consistently associated with negative academic outcomes, including low academic achievement, delayed study completion, and psychological distress (Kim & Seo, 2015; Klassen & Kuzucu, 2009; Maulana & Syakarofath, 2025). Empirical studies indicate that more than half of university students frequently delay major academic tasks, such as completing assignments and preparing for examinations, often resulting in emotional discomfort and academic stress (Anggerahma & Suryadi, 2025; Firnanda & Prastiwi, 2024; Ghani & Surawan, 2025; Karas & Spada, 2009; Laka et al., 2025).

Previous studies consistently report that academic procrastination is negatively associated with academic achievement and study persistence, while being positively related to academic stress and learning burnout (Bäulke et al., 2025; Boe & Säfvenbom, 2018; Hakim et al., 2025; Sulnasulastri et al., 2025). Within contemporary educational psychology, academic procrastination is conceptualized as a failure of academic self-regulation involving cognitive, affective, and behavioral components (Cahyono et al., 2025; Choi & Moran, 2010).

Prior evidence indicates that poor time management, low self-control, and weak self-directed learning strategies are central predictors of academic procrastination among university students (Bäulke et al., 2025; Khan et al., 2025). In addition, emotional factors such as maladaptive perfectionism and academic anxiety further intensify procrastination tendencies, particularly under high evaluative pressure (Aisyah et al., 2025; Constantin et al., 2021; Pratama et al., 2025; Sidqi et al., 2025). Despite extensive international findings, empirical evidence on the latent structure of academic procrastination in local higher education contexts remains limited. In Riau Province, survey and institutional data indicate that a substantial proportion of students exhibit moderate to high levels of academic procrastination, accompanied by unstructured learning patterns and elevated academic anxiety (Hen, 2018; Putri et al., 2023; Roidah et al., 2022). The post-pandemic shift toward digital and self-directed learning has further intensified self-regulation demands among students in this region (Afrizal et al., 2025).

Accordingly, this study aims to identify the latent factor structure underlying academic procrastination among university students in Riau Province using Exploratory Factor Analysis (EFA)(Genc, 2021; Koekemoer et al., 2016; Trendafilov & Unkel, 2011; Unkel et al., 1862; Watson, 2017). By clarifying the dominant dimensions of academic procrastination, this study provides empirical evidence to support the development of data-driven academic policies, targeted student support services, and intervention programs designed to enhance academic self-regulation, manage academic anxiety, and reduce technology-related distractions in higher education settings.

RESEARCH METHODOLOGY

This study employed a quantitative approach with an exploratory research design to identify the latent factor structure underlying academic procrastination among university students based on questionnaire data. An exploratory design was adopted because the construct of academic procrastination in the studied context does not yet have an empirically established factor structure. Accordingly, Exploratory Factor Analysis (EFA) was employed as the main analytical technique, as it is appropriate for uncovering latent dimensions of psychological constructs within higher education settings in Riau Province.

The study was conducted across several higher education institutions in Riau Province, reflecting a diverse student population in terms of socioeconomic background and learning environments. The study population consisted of all active diploma and undergraduate students enrolled at the participating institutions. The research subjects were selected using a proportional stratified random sampling technique, with strata based on higher education institutions and study programs. The study involved 100 respondents, which is considered adequate for Exploratory Factor Analysis, as methodological guidelines suggest a minimum sample size of 5 respondents per item or an absolute minimum of 100 cases to achieve stable factor solutions. The research instrument was an academic procrastination questionnaire developed through a synthesis of self-regulation theory, academic anxiety, and recent empirical literature. The instrument was constructed in the form of closed-ended statements using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Conceptually, the questionnaire was designed to represent three main domains, namely Time Management and Academic Self-Regulation, Environmental Disturbances and Technological Distractions, and Perfectionism and Academic Anxiety.

Content validity was assessed through expert judgment involving lecturers with expertise in psychometrics and higher education. Initial reliability testing was conducted using Cronbach's

Alpha coefficient, with a value of ≥ 0.70 considered the criterion for instrument acceptability. Data collection was carried out using an online survey method. Respondents were provided with an informed consent form explaining the purpose of the study, data confidentiality, and their right to withdraw from participation at any time. All collected data were anonymous and used solely for academic purposes.

Data analysis was performed using IBM SPSS Statistics software. The initial stage of analysis involved descriptive statistics to describe respondent characteristics and the distribution of item responses. Subsequently, data suitability for factor analysis was examined using the Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity to ensure sufficient inter-item correlations and sampling adequacy prior to factor extraction. The data were considered appropriate for factor analysis when the KMO value exceeded 0.50 and Bartlett's test was statistically significant ($p < 0.05$).

Exploratory factor analysis was conducted using the Principal Axis Factoring (PAF) method, as it is more appropriate for identifying latent constructs based on shared variance. The determination of the number of factors was based on the eigenvalue greater than 1 criterion, scree plot analysis, as well as theoretical considerations and factor interpretability. To obtain a clear and interpretable factor structure, Promax rotation was applied, as this oblique rotation method is appropriate when underlying factors are theoretically and empirically correlated. Items with factor loadings ≥ 0.50 were retained, while items with high cross-loadings or low loadings were eliminated. After the final factor structure was established, the internal reliability of each factor was re-evaluated using Cronbach's Alpha. Factors meeting the reliability criteria were subsequently labeled according to the conceptual relevance of their constituent items. Factor interpretation was conducted by integrating empirical factor loadings with relevant theoretical frameworks to ensure conceptual coherence and reduce subjective bias in factor labeling.

RESULTS AND DISCUSSIONS

Data Suitability Testing for Exploratory Factor Analysis

The initial stage of analysis was conducted to ensure that the academic procrastination questionnaire data met the assumptions required for Exploratory Factor Analysis (EFA). Assessing data suitability is a crucial step, as EFA requires sufficient inter-item correlations to allow for the meaningful extraction of latent factors. The evaluation of data adequacy was performed using the Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, as presented in Table 1.

Table 1. KMO and bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.902
Bartlett's Test of Sphericity	Approx. Chi-Square	1967.677
	df	190
	Sig.	0.000

A Kaiser Meyer Olkin (KMO) value of 0.902 and a significant Bartlett's Test of Sphericity ($\chi^2 = 1967.677$; df = 190; $p < 0.001$) indicate that the data are adequate and suitable for Exploratory Factor Analysis.

Communalities Values

After the data were confirmed to be suitable for Exploratory Factor Analysis (EFA) based on the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity, the next step involved evaluating the communalities values for each item. Communalities represent the proportion of variance in each item that can be explained by the extracted factors. Higher communalities values indicate a greater contribution of the item to the underlying latent factor structure. The communalities analysis was conducted using the Principal Axis Factoring (PAF)

extraction method. The results showed that all items exhibited extraction communalities above 0.50, indicating that each item made an adequate contribution to the factor structure. The extracted communalities values ranged from 0.547 to 0.811.

The item with the highest extraction communality was C1 (0.811), indicating that more than 80% of the variance in this item was explained by the extracted latent factors. This high communality value suggests that item C1 is a highly representative indicator for measuring the construct of academic procrastination. In contrast, the item with the lowest extraction communality was C4 (0.547). Although this value was lower relative to the other items, it remains above the minimum threshold recommended in factor analysis, and therefore the item was retained in the model. Overall, the relatively high communalities values across all items indicate that the extracted factors adequately explain a substantial proportion of the variance in each item. Consequently, no items were eliminated at the communalities stage, and all items were deemed suitable to proceed to the stages of factor retention determination and factor rotation.

Determination of the Number of Factors Based on the Scree Plot

The number of factors was determined by examining the scree plot and the eigenvalues obtained from the extraction using the Principal Axis Factoring (PAF) method.

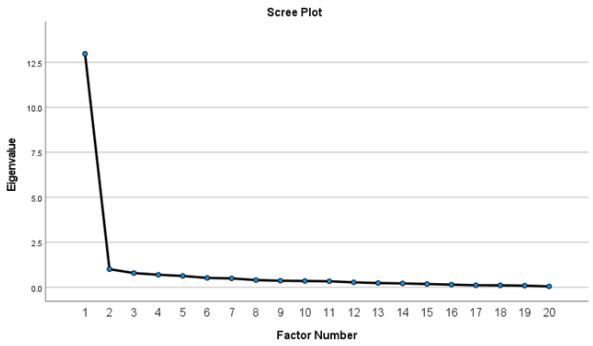

Figure 1. Scree plot

Based on the scree plot, a sharp decline in eigenvalues is observed from the first to the second factor, followed by a relatively flat curve after the second factor. This pattern indicates that the first factor contributes a highly dominant proportion of variance, whereas the subsequent factors account for relatively small incremental variance. Accordingly, the scree plot suggests that two main factors represent the most appropriate and interpretable structure for explaining academic procrastination among students, while the third and subsequent factors do not contribute meaningful additional variance.

Total Variance Explained

The results of the Total Variance Explained analysis indicate that only two factors met the extraction criteria and were retained in the factor model. The first factor had an initial eigenvalue of 12.978, accounting for 64.888% of the total variance. After extraction, this factor continued to demonstrate a substantial contribution, explaining 63.246% of the variance, thereby confirming that it represents the dominant dimension in the structure of academic procrastination. The second factor had an initial eigenvalue of 1.007, explaining 5.036% of the variance. Following extraction, this factor accounted for 3.452% of the variance, resulting in a cumulative variance explained of 66.699% by the two retained factors. The third and subsequent factors exhibited eigenvalues below 1 and were therefore not retained in the model, as their contributions to the total variance were relatively small and did not meet the extraction criteria. Overall, the two retained factors explain more than 66% of the total variance, which is considered adequate in research within the fields of education and psychology.

Factor Rotation

To obtain a clearer and more substantively interpretable factor structure, factor rotation was performed using the Promax rotation method with Kaiser normalization. Based on the Structure Matrix, all items exhibited high factor loadings on both factors, with loading values ranging from 0.628 to 0.900. No items showed low loadings (i.e., < 0.50); therefore, all items were retained in the analysis. However, it was observed that nearly all items loaded relatively highly on both factors, indicating a strong correlation between factors as well as overlapping construct characteristics. This condition suggests that academic procrastination among students in this study demonstrates a strong unidimensional tendency with one dominant factor, while still being conceptually distinguishable into two broad, overlapping dimensions.

Factor Interpretation and Labeling

Factor 1: Time Management and Academic Self-Regulation. The first factor emerged as the dominant factor, accounting for the largest proportion of explained variance. Items loading on this factor are associated with students' inability to manage time effectively, delays in task initiation, lack of study discipline, and weak self-control in academic activities. The dominance of this factor indicates that academic procrastination primarily stems from failures in self-regulation and time planning, leading students to postpone academic tasks despite being aware of the potential academic consequences.

Factor 2: Environmental Disruptions, Technology Distraction, and Psychological Pressure. The second factor reflects the influence of both external and internal conditions experienced by students, including disruptions in the learning environment, digital technology distractions, and emotional pressures accompanying academic task completion. The high correlation between the second factor and the first factor suggests that environmental disturbances and psychological pressure exacerbate deficiencies in students' self-regulation, thereby increasing the tendency toward academic procrastination.

Discussion

The results of the Exploratory Factor Analysis indicate that academic procrastination among university students is characterized by a two-factor structure with one highly dominant factor. The first factor, time management and academic self-regulation, explains the largest proportion of variance, suggesting that procrastination behavior is primarily driven by internal regulatory deficiencies rather than by external situational factors alone. This finding is consistent with previous studies that conceptualize academic procrastination as a manifestation of self-regulation failure (Cahyono et al., 2025; Choi & Moran, 2010) and supports empirical evidence reported by (Bäulke et al., 2025), who identified poor time management and low self-control as central predictors of procrastination among university students.

Compared with international studies, the dominance of the self-regulation factor in this study reinforces the generalizability of self-regulation theory across cultural contexts, while simultaneously extending prior findings by demonstrating its relevance in the local higher education context of Riau Province. Whereas previous research in Indonesia has predominantly examined academic procrastination as an outcome variable associated with stress, burnout, or academic achievement (Hakim et al., 2025; Putri et al., 2023), the present study contributes new empirical insight by uncovering the latent dimensional structure underlying procrastination behavior using a robust exploratory approach.

The second factor, which encompasses environmental disruptions and technology-related distractions, exhibits a strong correlation with the first factor, indicating that external conditions tend to exacerbate existing weaknesses in students' self-regulatory capacities. This finding aligns with prior evidence suggesting that digital distractions and non-conducive learning environments intensify procrastination tendencies, particularly in learning contexts that demand high levels of autonomy and self-directed regulation (Sidqi et al., 2025; Svartdal, 2015). The strong association

between the two factors further supports theoretical perspectives that view academic procrastination as a multidimensional yet interrelated construct rather than as a set of independent components.

From a theoretical standpoint, the results strengthen self-regulated learning theory by empirically demonstrating that self-regulation functions as the core dimension of academic procrastination, while environmental and emotional factors operate as reinforcing mechanisms. This findingchallenges overly fragmented conceptualizations of procrastination that separate internal and external determinants rigidly, and instead supports an integrative framework in which contextual pressures interact dynamically with individual self-regulatory processes.

Practically, these findings imply that interventions aimed at reducing academic procrastination should prioritize the development of students' time management and self-regulation skills, complemented by institutional efforts to manage learning environments and regulate technology use. In the context of higher education institutions in Riau Province, academic support programs that integrate self-regulated learning training, academic mentoring, and digital distraction management may be more effective than interventions focusing solely on behavioral control or motivational enhancement.

CONCLUSION

This study identified a two-factor structure underlying academic procrastination among university students, with time management and academic self-regulation emerging as the dominant dimension, and environmental and technology-related distractions functioning as a correlated supporting factor. The dominance of the first factor indicates that academic procrastination is primarily rooted in deficiencies in self-regulatory processes rather than in academic ability alone. The main scientific contribution of this study lies in its empirical clarification of the latent dimensional structure of academic procrastination within the local higher education context of Riau Province using Exploratory Factor Analysis. By revealing a nearly unidimensional structure with a highly influential core factor, this study extends prior research that has predominantly examined procrastination only through correlational approaches. From a practical perspective, the findings suggest that institutional efforts to reduce academic procrastination should prioritize interventions aimed at strengthening students' time management and self-regulation skills, complemented by strategies to manage learning environments and mitigate technology-related distractions. Such targeted interventions are expected to enhance academic persistence and learning quality. Future research is recommended to validate the identified factor structure using confirmatory factor analysis, to examine its stability across different institutional contexts, and to investigate longitudinally how self-regulation and environmental factors interact in shaping academic procrastination over time.

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References

Afrizal, D., Alfaruqy, M. Z., & Kahija, Y. F. La. (2025). Prokrastinasi Akademik dan Alienasi pada Mahasiswa Psikologi Unibversitas Diponegoro Angkatan 2019 yang Mengerjakan Skripsi. *Jurnal Empati*, *14*(6), 548–556.

Aisyah, A., Aini, D. K., & Azaria, U. N. (2025). Dibalik Kecanduan Media Sosial pada Remaja: Pengaruh Stres Akademik dan Kecemasan Sosial dengan Regulasi Emosi sebagai Mediator. *Personifikasi: Jurnal Ilmu Psikologi*, *16*(2), 77–95.

Anggerahma, S., & Suryadi, D. (2025). Peran Grit terhadap Prokrastinasi Akademik pada Mahasiswa Perguruan Tinggi Swasta di Jakarta. *Jurnal Mahasiswa Humanis*, *5*(1), 306–320.

Bäulke, L., Daumiller, M., Wenker, T., Scheunemann, A., Grunschel, C., Wirth, J., Fries, S., Leutner, D., & Dresel, M. (2025). On the development of motivational regulation strategy knowledge and its longitudinal relationship with academic procrastination over the course of study. *Journal of Educational Psychology*.

Boe, O., & Säfvenbom, R. (2018). *The Relationship between Self-Concept, Self- Efficacy, and Military Skills and Abilities*. *17*(10), 18–42.

Cahyono, M. Y. M., Rohinsa, M., & Zega, T. G. C. (2025). Peran Self-Regulated Learning Sebagai Mediator Dalam Hubungan Self-Efficacy dan Prokrastinasi Akademik pada Mahasiswa. *SENTRI: Jurnal Riset Ilmiah*, *4*(7), 816–826.

Choi, J. N., & Moran, S. V. (2010). *Why Not Procrastinate? Development and Validation of a New Active Procrastination Scale Why Not Procrastinate? Development and Validation of a New Active Procrastination Scale*. (November 2014), 37–41. https://doi.org/10.3200/SOCP.149.2.195-212

Constantin, K. L., Powell, D. M., & McCarthy, J. M. (2021). Expanding conceptual understanding of interview anxiety and performance: Integrating cognitive, behavioral, and physiological features. *International Journal of Selection and Assessment*, *29*(2), 234–252.

Firnanda, E., & Prastiwi, E. H. (2024). Pengaruh Cita Rasa, Kualitas Produk dan Presepsi Harga Terhadap Keputusan Pembelian Konsumen pada Pabrik Tahu Bapak Wito di Kelurahan Ledok Kulon Bojonegoro. *Musytari: Neraca Manajemen, Akuntansi, Dan Ekonomi*, *3*(7), 91–100.

Genc, O. (2021). Identifying principal risk factors in Turkish construction sector according to their probability of occurrences: a relative importance index (RII) and exploratory factor analysis (EFA) approach. *International Journal of Construction Management*, *0*(0), 1–9. https://doi.org/10.1080/15623599.2021.1946901

Ghani, H. N., & Surawan, S. (2025). Upaya Regulasi Diri Dalam Mengurangi Prokrastinasi Akademik Pada Mahasiswa: Studi Kasus Dalam Penyelesaian Tugas. *Jurnal Konseling Dan Psikologi Indonesia*, *1*(3), 201–216.

Hakim, A., Putrie, C. A. R., & Winarsih, S. (2025). Pengaruh Prokrastinasi Akademik Terhadap Hasil Belajar Siswa Kelas VII di MTs Miftahul Amal Bekasi. *Jurnal Ilmu Sosial Dan Humaniora*, *1*(3), 1239–1248.

Hen, M. (2018). Academic procrastination and feelings toward procrastination in LD and non-LD students: Preliminary insights for future intervention. *Journal of Prevention & Intervention in the Community*, *46*(2), 199–212. https://doi.org/10.1080/10852352.2016.1198173

Karas, D., & Spada, M. M. (2009). *Coaching : An International Journal of Theory , Research and Practice Brief cognitive-behavioural coaching for procrastination : a case series*. (January 2015), 37–41. https://doi.org/10.1080/17521880802379700

Khan, M. J., Siddique, K., & Abbasi, S. (2025). Sociological Research and Innovation (SRI). *Sociological Research and Innovation (SRI)*, *3*(1), 181–197.

Kim, K. R., & Seo, E. H. (2015). The relationship between procrastination and academic performance: A meta-analysis. *Personality and Individual Differences*, *82*, 26–33.

Klassen, R. M., & Kuzucu, E. (2009). Academic procrastination and motivation of adolescents in Turkey. *Educational Psychology: An International Journal of Experimental Educational Psychology*, *29*(1), 69–81. https://doi.org/10.1080/01443410802478622

Koekemoer, E., Nel, J. A., & Toit, A. (2016). *The exploratory and confirmatory factor analyses of two subjective career success instruments*. *0237*(February). https://doi.org/10.1080/14330237.2015.1124612

Laka, M. V., Astikasari, H., & Murti, S. (2025). *Hubungan Metakognisi dengan Prokrastinasi Akademik pada Mahasiswa*. *8*, 13718–13725.

Maulana, A., & Syakarofath, N. A. (2025). Peran academic burnout terhadap prokrastinasi akademik pada mahasiswa kota Malang. *Jurnal Integrasi Riset Psikologi*, *3*(2), 21–34.

Pratama, R. A., Purwati, P., Sari, I. N., Nikmah, F. K., & Japar, M. (2025). Prokrastinasi Akademik sebagai Jembatan antara Perfeksionisme Adaptif dan Kesejahteraan Psikologis: Mindfulness sebagai Variabel Moderasi. *PSIKODIMENSIA*, *24*(1), 26–36.

Putri, K. P. D., Nauli, F. A., & Aziz, A. R. (2023). Hubungan burnout terhadap perilaku prokrastinasi akademik pada mahasiswa keperawatan Universitas Riau. *JUKEJ: Jurnal Kesehatan Jompa*, *2*(2), 164–177.

Roidah, S., Wilson, W., & Achmad, S. S. (2022). Hubungan Kecemasan dengan Prokrastinasi Akademik Mahasiswa Prodi Pendidikan Masyarakat dalam Melaksanakan PLP FKIP UNRI. *Ideas: Jurnal Pendidikan, Sosial, Dan Budaya*, *8*(1), 197–202.

Sidqi, M. H., Nurdiansah, I. D., & Darmawan, D. (2025). Faktor-faktor yang Mempengaruhi Prokrastinasi Akademik Mahasiswa: Kejenuhan Akademik, Kecanduan Media Sosial, dan Stres Akademik. *FONDATIA*, *9*(2), 437–460.

Sulnasulastri, E., Pandang, A., & Harum, A. (2025). Academic Procrastination and Its Management in Vocational High School Students in Jeneponto Regency. *Pinisi Journal of Art, Humanity, and Social Studies*, *5*(3), 11–22.

Svartdal, F. (2015). Measuring procrastination: Psychometric properties of the Norwegian versions of the Irrational Procrastination Scale (IPS) and the Pure Procrastination Scale (PPS). *Scandinavian Journal of Educational Research*, *61*(1), 1–15. https://doi.org/10.1080/00313831.2015.1066439

Trendafilov, N. T., & Unkel, S. (2011). Journal of Computational and Graphical Exploratory Factor Analysis of Data Matrices With More Variables Than Observations Exploratory Factor Analysis of Data Matrices With More Variables Than Observations. *Journal of Computational and Graphical Statistics*, *20*(4), 874–891. https://doi.org/10.1198/jcgs.2011.09211

Unkel, S., Trendafilov, N. T., Hannachi, A., & Jolliffe, T. (1862). *Independent exploratory factor analysis with application to atmospheric science data*. (May 2015), 37–41. https://doi.org/10.1080/02664760903166280

Watson, J. C. (2017). Development Establishing Evidence for Internal Structure Using Exploratory Factor Analysis Factor Analysis. *Measurement and Evaluation in Counseling and Development*, *50*(4), 232–238. https://doi.org/10.1080/07481756.2017.1336931