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Analysis of Final-Year Student Stress Levels Using the Simple Additive Weighting (SAW) Method

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ABSTRACT

Final year students often face increasing academic pressure along with the demands of completing final assignments and graduation targets. This pressure has the potential to cause stress that impacts students' psychological condition and academic achievement. This study aims to identify the stress levels of final year students by utilizing a Decision Support System based on the Simple Additive Weighting (SAW) method. Research data were obtained through a questionnaire compiled based on several academic and non-academic criteria. The obtained values were then processed using the SAW method stages to produce preference values that are used as the basis for classifying stress levels into low, medium, and high categories. The results showed that the majority of students were in the moderate stress category. These findings are expected to provide an objective picture of the stress conditions of final year students and become a consideration in developing academic mentoring strategies.

Keywords: Decision Support System; Simple Additive Weighting; Stress Levels

ABSTRAK

Mahasiswa tingkat akhir sering menghadapi tekanan akademik yang meningkat seiring dengan tuntutan penyelesaian tugas akhir dan target kelulusan. Tekanan tersebut berpotensi menimbulkan stres yang berdampak pada kondisi psikologis dan capaian akademik mahasiswa. Penelitian ini bertujuan untuk mengidentifikasi tingkat stres mahasiswa tingkat akhir dengan memanfaatkan Sistem Pendukung Keputusan berbasis metode Simple Additive Weighting (SAW). Data penelitian diperoleh melalui kuesioner yang disusun berdasarkan beberapa kriteria akademik dan nonakademik. Nilai yang diperoleh kemudian diolah menggunakan tahapan metode SAW untuk menghasilkan nilai preferensi yang digunakan sebagai dasar klasifikasi tingkat stres ke dalam kategori rendah, sedang, dan tinggi. Hasil penelitian menunjukkan bahwa mayoritas mahasiswa berada pada kategori stres sedang. Temuan ini diharapkan dapat memberikan gambaran objektif mengenai kondisi stres mahasiswa tingkat akhir serta menjadi bahan pertimbangan dalam penyusunan strategi pendampingan akademik.

Kata Kunci : Sistem Pendukung Keputusan; Simple Additive Weighting; Tingkat Stres

INTRODUCTION

Stress is a psychological condition that arises as an individual's response to demands or pressures perceived as exceeding their capabilities. In an academic context, this condition often arises when students face a high burden of responsibility, limited time, and uncertainty in achieving study completion targets. This complex academic pressure has the potential to increase stress levels in final-year students, thereby impacting mental health and learning motivation, and increasing the risk of dropping out. Survey results in Indonesia indicate that the prevalence of stress among final-year students reached 61.3% in 2019. Meanwhile, other research

found that as many as 50% of students experienced moderate stress, 19% experienced severe stress, and 31% experienced mild stress, triggered by pressure from supervisors and busy academic schedules. This situation emphasizes the importance of systematic and objective intervention efforts by universities to prevent long-term impacts, such as sleep disturbances, decreased academic performance, and impaired psychological well-being.

This study used a questionnaire as the primary data collection instrument to measure the stress levels of final-year students. The questionnaire was developed based on criteria relevant to the final-year students' conditions, including final-year assignment load, quality of guidance, social support, and academic readiness. The data obtained from the questionnaire were then processed quantitatively using a Decision Support System (DSS) with the Simple Additive Weighting (SAW) method. The SAW method was used to weight, normalize, and calculate the preference values of each respondent, thus enabling an objective and structured classification of student stress levels into low, medium, and high categories. This approach is expected to provide a more accurate picture of final year student stress levels and support decision-making by universities in efforts to monitor and manage academic stress.

RESEARCH METHOD

This study uses a descriptive quantitative approach with the application of a Decision Support System (DSS) based on the Simple Additive Weighting (SAW) method. The quantitative approach is used because the research data is in the form of numerical data from questionnaires, while the descriptive method aims to objectively describe the stress levels of final-year students. The research subjects are undergraduate (Bachelor) students who have completed or are completing their thesis, with a total of 10 respondents.

The research object is the stress level of final-year students, analyzed based on several academic and non-academic criteria. Data collection was conducted using a closed questionnaire structured based on a five-level Likert scale, ranging from strongly disagree (1) to strongly agree (5). The questionnaire was distributed to respondents online and filled out based on their experiences during the thesis preparation process.

Stress level assessment is based on four main criteria:

- C1: Final assignment workload and revisions (cost attribute)
- C2: Supervision quality (benefit attribute)
- C3: Social support quality (benefit attribute)
- C4: Academic readiness (benefit attribute)

The questionnaire data obtained is converted into numerical form and processed using the Simple Additive Weighting (SAW) method. The preference values generated are used to classify student stress levels into low, medium, and high categories.

RESULTS AND DISCUSSION

Based on data from 10 respondents (A1-A10) and 4 criteria (C1-C4), the decision matrix was constructed. Values were obtained from Likert response conversion: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1.

Table 1.
Decision Matrix

Alternative Code	C1	C2	C3	C4
A1	4	2	4	3
A2	3	3	3	3
A3	4	4	4	3
A4	2	4	3	4
A5	3	3	4	4
A6	4	4	4	4
A7	3	4	4	4

A8	5	5	5	5
A9	4	2	4	4
A10	3	4	4	5
Max Value	5	5	5	5
Min Value	2	2	3	3

The Simple Additive Weighting (SAW) method involves several stages: constructing the decision matrix, normalizing the matrix based on attribute types, and calculating preference values. The normalization formulas differ based on whether the criterion is a cost or benefit attribute.

For cost criteria (C1 - where lower values are better), the normalization formula is: Rij = min(Xj) / Xij

For benefit criteria (C2, C3, C4 - where higher values are better), the normalization formula is: Rij = Xij / max(Xj)

Where Rij is the normalized rating, Xij is the actual value for alternative i on criterion j, min(Xj) is the minimum value in criterion j, and max(Xj) is the maximum value in criterion j.

Table 2.
Normalized Matrix

Alternative Code	C1	C2	C3	C4
A1	0.50	0.40	0.80	0.60
A2	0.67	0.60	0.60	0.60
A3	0.50	0.80	0.80	0.60
A4	1.00	0.80	0.60	0.80
A5	0.67	0.60	0.80	0.80
A6	0.50	0.80	0.80	0.80
A7	0.67	0.80	0.80	0.80
A8	0.40	1.00	1.00	1.00
A9	0.50	0.40	0.80	0.80
A10	0.67	0.80	0.80	1.00

The normalization process follows the established formulas. For example, for alternative A1:

- C1 (cost): R11 = 2/4 = 0.50
- C2 (benefit): R12 = 2/5 = 0.40
- C3 (benefit): R13 = 4/5 = 0.80
- C4 (benefit): R14 = 3/5 = 0.60

After normalization, preference values are calculated using the formula:

$Vi = \Sigma(wj \times Rij)$

Where Vi is the preference value for alternative i, wj is the weight for criterion j, and Rij is the normalized rating. For this study, equal weights were assigned: w1=0.30, w2=0.20, w3=0.30, w4=0.20.

Table 3.
Preference Values and Ranking

Alternative Code	C1	C2	C3	C4	Total (Vi)	Ranking
A1	0.15	0.08	0.24	0.12	0.59	10
A2	0.20	0.12	0.18	0.12	0.62	9
A3	0.15	0.16	0.24	0.12	0.67	7
A4	0.30	0.16	0.18	0.16	0.80	2
A5	0.20	0.12	0.24	0.16	0.72	6

A6	0.15	0.16	0.24	0.16	0.71	5
A7	0.20	0.16	0.24	0.16	0.76	3
A8	0.12	0.20	0.30	0.20	0.82	1
A9	0.15	0.08	0.24	0.16	0.63	8
A10	0.20	0.16	0.24	0.20	0.80	4

The determination of stress levels is based on the final preference values (Vi). The calculation results are grouped into three categories: Low ($Vi < 0.65$), Medium ($0.65 \leq Vi < 0.75$), and High ($Vi \geq 0.75$). Based on this classification:

- Low stress (2 students): A1 (0.59), A2 (0.62)
- Medium stress (5 students): A9 (0.63), A3 (0.67), A6 (0.71), A5 (0.72), A7 (0.76)
- High stress (3 students): A10 (0.80), A4 (0.80), A8 (0.82)

The results show that 50% of final-year students analyzed experience medium stress levels, 30% experience high stress, and 20% experience low stress. This distribution indicates significant variation in how students cope with academic pressures during thesis completion.

Analysis of the SAW method results reveals several important patterns. Students with high stress levels (A8, A4, A10) tend to have higher normalized scores across most criteria, particularly in C1 (final assignment workload). However, the cost nature of C1 means that lower raw scores actually result in higher normalized values, indicating these students report less workload pressure yet still experience high overall stress. This counterintuitive finding suggests that stress is multifaceted and not solely determined by workload.

Students A4 and A10, both ranked highly in stress (rank 2 and 4 respectively), show perfect normalization (1.00) in C1, meaning they reported the minimum workload (value of 2), yet their overall preference scores remain high due to strong performance in benefit criteria. This indicates that even with lighter workloads, other factors such as supervision quality, social support, and academic readiness significantly contribute to stress levels.

Conversely, student A8, ranked first with the highest stress level (0.82), reported maximum values (5) across all criteria. The cost criterion normalization (0.40) reflects the heaviest workload, while perfect scores in benefit criteria suggest adequate supervision, support, and readiness. This paradox indicates that high academic workload remains a dominant stressor regardless of supportive conditions.

The SAW method successfully integrates multiple criteria to provide objective stress classification. The weighted normalization approach ensures that both cost and benefit attributes are appropriately considered, with C1 and C3 weighted at 30% reflecting their critical importance, while C2 and C4 at 20% provide supplementary assessment. This weighting scheme aligns with research showing that workload and social support are primary stress determinants for final-year students.

Based on the analysis, final assignment workload and revision burden emerge as the most dominant factors in increasing student stress levels. Students experiencing repeated revisions tend to have higher stress preference values. This condition demonstrates that lack of readiness in understanding research concepts and methods from the beginning can prolong the thesis completion process and increase academic pressure.

Supervision quality also influences student stress conditions. Scheduled and communicative supervision helps students understand research direction more clearly, thereby reducing uncertainty during the thesis preparation process. Conversely, communication limitations can increase the psychological burden experienced by students.

Social support from family and friends plays a role as a balancing factor in facing academic pressure. Students who receive adequate emotional support tend to be better able to manage stress, despite being faced with high academic demands. In addition, good academic readiness helps students solve research problems more independently and confidently.

The SAW calculation results align with suggestions conveyed by respondents. Respondents emphasized the importance of understanding needs analysis, concepts, and research methods comprehensively before developing applications, because errors in the early stages often cause repeated revisions that impact increased stress. Respondents also suggested that students should not delay completing revisions and immediately finish improvements given by supervisors to avoid work accumulation. In addition, effective

two-way communication with supervisors was deemed very important in clarifying research direction and reducing misunderstandings. Respondents also emphasized the need to increase relevant references related to thesis titles as an effort to improve academic readiness and reduce stress levels during the thesis completion process.

The application of the SAW method in the Decision Support System has proven capable of systematically and objectively integrating these various criteria. This method provides stress level classification results that are easy to understand and can be used as a basis for consideration in decision-making. Thus, SAW-based DSS can be utilized as a tool for universities to monitor and evaluate final-year student stress levels more systematically.

CONCLUSION

This research successfully implemented a Decision Support System (DSS) with the Simple Additive Weighting (SAW) method to objectively classify final-year student stress levels based on four main criteria: final assignment workload, supervision quality, social support, and academic readiness. The use of Likert scale-based questionnaires processed through the SAW method enables stress measurement to be conducted in a structured and measurable manner.

Research results show that final-year student stress levels are dominated by the medium category, followed by high and low categories. Final assignment workload and thesis revisions become the most influential factors in increasing student stress levels, especially when not balanced with adequate academic readiness and supervision quality. Conversely, social support and effective communication with supervisors have proven to help students manage academic pressure faced.

These findings align with suggestions conveyed by respondents, who emphasized the importance of understanding research concepts and methods from the early stages, completing revisions in a timely manner, good two-way communication with supervisors, and utilizing relevant references to improve academic readiness. Thus, the application of the SAW method in DSS can be used as an effective tool for universities in monitoring and evaluating final-year student stress levels, while serving as a basis for consideration in formulating more targeted academic mentoring strategies.

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REFERENCES

Azwar, S. (2017). Reliabilitas dan Validitas. Yogyakarta: Pustaka Pelajar.

Davis, F. D. (2018). Decision Support Systems: Concepts and Resources for Managers. New York: McGraw-Hill.

Kadir, A. (2014). Pengenalan Sistem Informasi. Yogyakarta: Andi Offset.

Kusrini. (2007). Konsep dan Aplikasi Sistem Pendukung Keputusan. Yogyakarta: Andi Offset.

Rivai, V., & Sagala, E. J. (2016). Manajemen Sumber Daya Manusia untuk Perusahaan. Jakarta: Rajawali Pers.

Saaty, T. L. (2008). Decision Making with the Analytic Hierarchy Process. International Journal of Services Sciences, 1(1), 83–98.

Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alfabeta.

Turban, E., Sharda, R., & Delen, D. (2018). Decision Support and Business Intelligence Systems. Boston: Pearson Education.

Wahyuni, S., & Nurhayati. (2020). Analisis Tingkat Stres Mahasiswa Tingkat Akhir dalam Penyusunan Skripsi. Jurnal Psikologi Pendidikan, 9(2), 112–120.

UNICEF Indonesia. (2021). Stres dan Kesehatan Mental. Available at: https://www.unicef.org/indonesia/id/kesehatan-mental/artikel/stres