



Time Management and Procrastination Patterns Among Undergraduate Agriculture Students

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HIGHLIGHTS

- The assessment of time management and procrastination focuses on students' planning, prioritization, goal setting, use of time-saving techniques, and avoidance of procrastination behaviors.
- Task prioritization and personal time management were the strongest aspects of time management behavior among students across the three cohorts.
- Students from the 2022 and 2023 cohorts showed a strong positive correlation in their time management behavioural patterns.

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ABSTRACT

Academic and personal success among students is achieved when they can manage their time effectively without procrastination. The present study was conducted in 2025 to examine time management behaviors and procrastination tendencies among 101 undergraduate students across three batches: 2021 (N = 28), 2022 (N = 33), and 2023 (N = 40) from the College of Agriculture, Vellayani. A 20-item standardized questionnaire, rated on a 5-point Likert scale, revealed a gradual decline in batch-wise mean scores: 2.238 (2021), 2.199 (2022), and 2.014 (2023). Students consistently scored highest in task prioritization (Mean = 3.17) and personal time management, while daily task listing (Mean = 1.48) and short task scheduling (Mean = 1.11) were persistent weaknesses. Heatmap and Spearman correlation analyses indicated behavioral consistency between the 2022 and 2023 cohorts ($r = 0.818$) and divergence with the 2021 batch. The results of the one-way ANOVA and paired t-tests indicate that there are no statistically significant differences in time management scores among the batches. The results highlight the need for early interventions that strengthen micro-level planning behaviours, thereby reducing procrastination tendencies, enhancing academic self-regulation, and improving undergraduate learning outcomes.

INTRODUCTION

In higher education and research environments, the ability to prioritize tasks, plan systematically, and manage activities efficiently is essential for achieving academic goals while maintaining relevance and integrity (Velamuri & Mallappa, 2025). Time management is widely recognized as a cornerstone of academic achievement,

enabling students to efficiently allocate cognitive and emotional resources across academic, personal, and professional domains (Claessens et al., 2007; Cyril, 2014; Galaviz et al., 2025). In higher education, especially in academically rigorous and interdisciplinary environments such as agricultural universities, the ability to prioritize tasks, create schedules, and self-regulate time is essential. These skills are crucial for successfully managing coursework,

fieldwork, and assignments, as well as planning for the future (Kearns & Gardiner, 2007). Capacity building of students to improve their time management skills is essential to ensure their academic success, strengthen institutional effectiveness, and prepare a more competent, professionally equipped society (Alyami et al., 2021; Wilson et al., 2021; Fu et al., 2025). Studies have demonstrated the positive impact of effective time use on academic performance. Galaviz et al. (2025) highlight the benefits of planning and goal-setting for improving both Grade Point Average (GPA) and self-efficacy. This foundational insight was further developed by Cyril (2014), whose Time Management Behavior Scale (TMBS) introduced a structured framework for assessing goal-setting, planning, prioritization, and perceived control over time.

More recent research (Eilam & Aharon, 2003; Kearns & Gardiner, 2007; Zhou et al., 2022) underscores how metacognitive skills, self-monitoring, and resistance to digital distractions enhance time management and reduce academic stress. Conversely, procrastination is a self-regulatory failure that stems from impulsivity and an aversion to tasks. It has been shown to reduce time efficiency, lower performance, and increase psychological distress (Steel, 2007; Sirois, 2014; Sirois, 2023). Procrastination along with poor time management, can result in delays, increased stress, and reduced performance (Häfner et al., 2014). Procrastination tends to decline during high-stakes academic transitions, indicating that contextual factors can influence student behavior, and is negatively correlated with self-regulation among college students (Tuckman, 2002; Bommareddy et al., 2022). By adopting a holistic approach to time management, institutions can significantly improve both individual performance and broader academic and research outcomes. When combined with the proactive involvement of government and academic institutions in promoting more equitable, efficient, and effective practices, this approach can further enhance student engagement in learning (Sabu & Roy, 2025).

Despite a robust body of literature on time management and procrastination, research remains limited in the context of agricultural education, where students encounter unique temporal challenges due to the integration of theoretical learning and intensive fieldwork (Yien et al., 2014; Alghamdi, 2022). Additionally, studies by Safiya et al. (2024) and Ahmady et al. (2021) have revealed a negative correlation between time management and stress levels among undergraduate students. Addressing this gap, the present study explores time management behavior and procrastination tendencies among undergraduate students from three consecutive batches (2021 to 2023) at College of Agriculture, Vellayani, guided by the research question: 'How do students manage their time during their undergraduate period, and how does it affect the procrastination patterns influencing their learning outcomes?'

METHODOLOGY

This study employed a quantitative, descriptive research design to assess and compare time management behaviors among undergraduate students enrolled in the College of Agriculture, Vellayani. A total of 101 students participated in the study, drawn from three consecutive academic batches: 2021 (N=28), 2022 (N=33), and 2023 (N=40). The sample was purposively selected

to capture variability in academic maturity, exposure to institutional routines, and proximity to career transitions.

Data were collected using a standardized 20-item Time Management Questionnaire developed to assess key behavioral domains such as planning, prioritization, goal setting, application of time-saving techniques, and avoidance of procrastination. Each item was rated on a 5-point Likert scale (Never = 0, Seldom = 1, Sometimes = 2, Often = 3, Always = 4), enabling the quantification of behavioral frequencies. Prior to administration, the instrument was piloted on a non-respondent sample, and reliability analysis produced a coefficient exceeding 0.8, confirming strong internal consistency. In addition, content validity assessment verified that the items accurately captured students' time management and procrastination tendencies. The tool, widely employed in earlier studies, thus provided a robust and reliable framework for examining self-regulatory time use in academic contexts.

The responses were processed to generate batch-wise mean scores for each item, which formed the basis of the statistical analyses. Descriptive statistics were first applied to identify patterns and trends, followed by comparative analysis across batches through ranking of items and graphical interpretation using line charts and heatmaps.

To examine whether differences existed across the three cohorts, a one-way ANOVA was applied to batch-wise mean scores, which appropriately captured variation at the group level. To complement this, paired t-tests were employed to explore pairwise differences between batches, and a dot-and-whisker plot was generated to visualize mean differences with confidence intervals. Further, Spearman's rank correlation was used to assess the consistency of time management behaviors across cohorts, providing additional insight into monotonic relationships.

RESULTS

The analysis of student responses revealed insightful patterns in time management behaviors across the three batches studied. The line chart in Figure 1 shows the mean scores per time management items across the three batches. The overall mean scores indicate a modest but notable decline in effective time management from senior to junior cohorts: 2.238 for the 2021 batch, 2.199 for the 2022 batch, and 2.014 for the 2023 batch. When individual items were ranked based on average scores, certain strengths emerged consistently across batches. Task Prioritization was the highest-rated behavior, with an impressive average score of 3.17, followed closely by Focused and Multitasking and Personal Time Management. These results reflect a commendable ability among students to recognize and manage high-priority tasks, and to carve out intentional time for reflection, planning, or rest. In contrast, several areas were identified as weak points in students' time management routines. The lowest-scoring behaviors included Short Task List creation (1.11), Daily Review (1.18), and Daily Task List usage (1.48). These findings indicate a lack of micro-level planning practices, such as breaking large tasks into manageable parts or reviewing progress regularly—skills that are essential for consistent academic performance and long-term goal attainment. These patterns underscore the need for structured interventions aimed at fostering granular time management habits, especially among students in their early years.

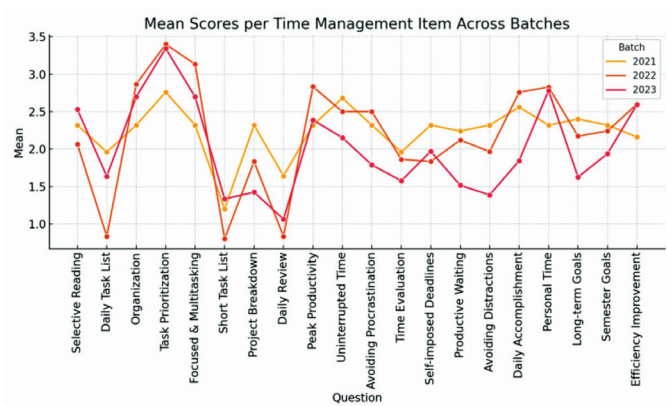


Figure 1. Line chart of mean scores per time management items across batches

Figure 2 presents a heatmap of time management scores by batch and provides a clear, comparative view of time management behaviors across the three batches, highlighting both strengths and weaknesses at a glance. Darker shades indicated higher average scores, revealing that skills such as Task Prioritization, Focused and Multitasking, and Personal Time were consistently stronger across all cohorts—particularly evident in the 2021 and 2022 batches. Conversely, lighter shades clustered around items like Short Task List, Daily Review, and Daily Task List, signifying persistent underperformance in these areas. This visual pattern confirmed that

while students may excel at high-level goal-setting and prioritization, they struggle with the finer, routine-based aspects of time management. The heatmap also reflected batch-wise consistency in both strengths and shortcomings, reinforcing the need for targeted training on micro-planning strategies, especially for underclassmen. Such visual tools are valuable not only for diagnostic analysis but also for communicating areas of concern to academic support teams and curriculum designers.

A Spearman rank-order correlation was conducted to assess the consistency and relational patterns in time management behaviors across different academic cohorts, based on the mean scores of all 20 items. This non-parametric method measures monotonic relationships without requiring the assumption of a normal distribution. The results revealed a strong positive correlation ($r = 0.818$) between the 2022 and 2023 batches, suggesting that these two cohorts share highly similar behavioral patterns—possibly influenced by similar institutional exposures, academic calendar routines, or shared post-pandemic classroom dynamics. A moderate correlation was observed between the 2021 and 2022 batches ($r = 0.617$), while the weakest, yet still statistically significant, correlation existed between the 2021 and 2023 cohorts ($r = 0.494$). These findings suggest a gradual behavioral shift over time, with seniors (2021) potentially having diverged due to increased academic maturity, goal orientation, or proximity to career transitions. The correlation heatmap visually underscores these trends, with warmer tones between 2022 and 2023 denoting tighter



Figure 2. Heatmap of time management scores by batch

alignment, while cooler tones with 2021 indicate moderate divergence.

A one-way ANOVA was conducted to examine whether there were statistically significant differences in time management scores among the three batches across all the selected parameters, and the results are displayed in Table 1. The results indicate that the differences in time management scores across batches are not statistically significant ($p > 0.05$). This suggests that the overall patterns of time management behavior among students remain largely similar over the years.

Although ANOVA showed no significant differences across batches ($F = 0.85$; $p = 0.435$), variations in p-values reveal useful insights. Selective Reading ($p = 0.86$), Task Prioritization ($p = 0.69$), and Peak Productivity ($p = 0.72$) were identified as highly stable behaviors with relatively high p-values, indicating uniformity and reflecting a shared academic culture among students. Project Breakdown ($p = 0.26$), Daily Review ($p = 0.41$), and Time Evaluation ($p = 0.44$) can be considered moderately variable behaviors of students across the three batches, indicating small fluctuations that may respond to targeted interventions. Daily Accomplishment ($p = 0.09$), Personal Time ($p = 0.08$), and Avoiding Distractions ($p = 0.13$) were identified as borderline sensitive behaviors, with p-values approaching significance. Emerging differences in these borderline sensitive areas may become more evident with larger sample sizes or well-designed training interventions. The findings reveal that time management behaviors are largely uniform across cohorts, indicating underlying systemic factors, while minor differences point to specific areas where institutions can intervene effectively.

Paired t-tests were also conducted between the batch-wise scores to further explore pairwise differences, and the results are

Table 1. One-way ANOVA of Time Management Scores Among the Three Batches

Parameter	F-Statistic	p-Value
Selective Reading	0.16	0.86
Daily Task List	2.47	0.15
Organization	0.57	0.58
Task Prioritization	0.39	0.69
Focused & Multitasking	1.04	0.42
Short Task List	1.05	0.42
Project Breakdown	1.67	0.26
Daily Review	1.1	0.41
Peak Productivity	0.34	0.72
Uninterrupted Time	0.78	0.48
Avoiding Procrastination	1.14	0.4
Time Evaluation	1.00	0.44
Self-imposed Deadlines	0.4	0.68
Productive Waiting	1.85	0.23
Avoiding Distractions	2.82	0.13
Daily Accomplishment	3.51	0.09
Personal Time	3.71	0.08
Long-term Goals	2.4	0.15
Semester Goals	0.91	0.46
Efficiency Improvement	1.16	0.39

F-statistic: 0.85; p-value: 0.435, *Significant if $p < 0.05$

Note: These figures are illustrative estimates derived using R; minor rounding differences may apply.

Table 2. Paired t-test between batches

Comparison	t-statistic	p-value
2021 vs 2022	0.32	0.749
2022 vs 2023	1.89	0.075
2021 vs 2023	2.02	0.058

presented in Table 2. None of the paired comparisons showed statistically significant differences (all $p > 0.05$), which is consistent with the ANOVA results. This suggests that regardless of batch, students tend to struggle similarly with time management issues such as inconsistent daily routines, underutilized planning tools, and lack of strategic goal setting.

The Dot-and-Whisker plot in Figure 3 visualizes the mean differences in time management scores between batches along with their 95% confidence intervals. The red vertical line at zero indicates no difference.

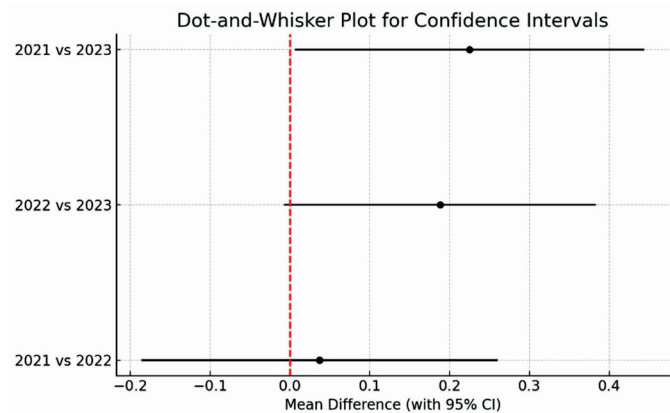


Figure 3. Dot and Whisker plot of time management scores across batches

Since all confidence intervals cross this line, we can conclude that there is no significant mean difference between any pair of batches. These observations reinforce the hypothesis that despite interventions or academic evolution, the fundamental time management behavior among undergraduate students remains similar across years.

DISCUSSION

The declining trend in time management from the 2021 to 2023 batches suggests a reduction in structured behaviors among younger cohorts, possibly reflecting a maturity effect in which students in more advanced stages of their academic programs demonstrate slightly better self-regulation and time use. This supports the developmental model of self-regulation, where time management skills improve with academic progression (Galaviz et al., 2025). The 2021 cohort's stronger performance may reflect their focus on placements or further studies, aligning with Claessens et al. (2007). In contrast, the 2022 and 2023 cohorts, still adjusting academically and socially, appear more prone to distractions and reactive planning, consistent with findings by Steel (2007); Kearns and Gardiner (2007). Students across all cohorts performed well in higher-order skills like Task Prioritization and Personal Time Management, aligning with Zhou et al. (2022), who noted students'

cognitive awareness often exceeds their behavioral follow-through. This “knowing–doing” gap reflects a disconnect between planning and execution. Low scores in micro-level behaviors such as Short Task Listing and Daily Review suggest weak procedural habits, critical for translating goals into action. These findings support Cyril (2014) and Kearns and Gardiner (2007), who emphasized that poor task breakdown and self-monitoring contribute to procrastination and reduced time control.

The heatmap highlighted both consistencies and differences in time management traits across cohorts. Common strengths in prioritization and weaknesses in review-based behaviors suggest systemic skill gaps. This aligns with Nonis and Hudson (2010), who emphasized the need for explicit instruction in time structuring. High Spearman correlation between the 2022 and 2023 batches ($r = 0.818$) indicates stable behavioral patterns, while the 2021 batch showed moderate alignment, possibly due to post-pandemic transitions and increased career focus. These trends, consistent with Tuckman (2002), point to evolving behaviors under academic pressure and highlight the value of visual analytics in educational assessment. The absence of statistically significant differences in time management scores across batches, as confirmed by ANOVA and paired t-tests, indicates a consistent behavioral pattern rather than cohort-specific variation. This suggests that common tendencies such as procrastination, reactive planning, and fragmented attention may be pervasive among students, regardless of academic year. The stability of these patterns may also reflect minimal changes in institutional routines or academic environments during the observed period.

In social science research, statistical non-significance does not mean irrelevance. In behavioural studies like time management, consistent patterns across groups can uncover underlying structural, cultural, or psychological influences. This study’s lack of significant differences in time management scores across batches suggests persistent habits shaped by institutional or generational norms. Recognizing these patterns provides valuable insights into the deeper dynamics of student behavior, moving beyond a solely significance-focused approach. Similarly, Mehler et al. (2019) and Edelsbrunner et al. (2024) in their studies highlighted the importance of non-significant findings in psychology and educational research, respectively.

This study reinforces the hypothesis that fundamental time management behaviors among undergraduate students in agricultural education remain largely unchanged across batches, despite evolving curricula, technological tools, and academic interventions. The observed stability in behavioral patterns is attributed to several interrelated factors. These include developmental traits such as procrastination and inconsistent scheduling common in early academic stages; persistent digital distractions; and static institutional cultures that fail to adapt pedagogical and mentoring approaches. Additionally, peer influence perpetuates informal time-use norms, while the lack of sustained, personalized interventions limits long-term behavioral change. Ambiguous academic demands and minimal variation in student demographics further contribute to the persistence of time management inefficiencies. These findings highlight the need for continuous, context-sensitive strategies and curriculum adaptations to deeply embedded behavioral patterns in

academic settings and meet students’ evolving needs (Yadav & Vatta, 2025). The findings of this study provide insights into the time management behaviors of undergraduate students in an agricultural academic setting. By analyzing behavioral patterns across three academic cohorts, the results not only highlight recurring strengths and weaknesses but also reveal batch-wise variations influenced by academic maturity.

CONCLUSION

Persistent time management inefficiencies among undergraduate students in agricultural education, with no significant differences across batches, indicate systemic behavioral patterns and provide compelling empirical evidence for the urgent need to implement targeted time management interventions within the undergraduate agricultural curriculum. Consistently low scores in short task scheduling, daily review, and task list usage reveal structurally ingrained behavioral gaps across cohorts. These overlooked micro-level inefficiencies can accumulate over time, leading to procrastination, poor planning, academic stress, and reduced long-term career readiness. Strategic training in time blocking, goal breakdown, and self-monitoring has been shown to reduce procrastination and improve student effectiveness. Embedding time management modules early in the curriculum, through short courses, project-based learning, digital tools, and peer mentorship, can promote proactive self-regulation with lasting academic and professional benefits. Faculty-led mentoring, supportive learning environments, and regular monitoring of task prioritization and workload can further strengthen students’ time management behaviors and reduce procrastination tendencies.

DECLARATIONS

Ethics approval and informed consent: The research was conducted in accordance with institutional guidelines and approved by all the authors. Ethical approval was obtained from all the participants, and informed consent was obtained from all participants before the study commenced.

Conflict of interest: The authors declare that there are no conflicts of interest in conducting this research study. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare that during the preparation of this work, they thoroughly reviewed, revised, and edited the content as needed. The authors take full responsibility for the final content of this publication.

Authors’ contribution: This work was carried out in collaboration between all the authors. Authors 1 and 2 collected the data, and Authors 3 and 4 performed the statistical analysis. The study was conceptualized, tabulated, interpreted, and the final draft of the manuscript was prepared by Authors 5, 6, and 7. All authors read and approved the final manuscript.

Data availability statement: The data that support the findings of this study are available upon reasonable request from the corresponding author.

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