PUBLISHED BY
JR EDUCATION

Available online at http://ijite.jredu.id

International Journal of Information Technology and Education (IJITE) 5 (3), (June 2026) 69 - 84

International Journal of Information Technology and Education (IJITE)

http://ijite.jredu.id

Adaptive Time Management Strategies in Surgical Residency Education: A Qualitative Study in A Teaching Hospital in Manado

Andriessanto C. Lengkong[1]*, Harol R Lumapow[1], Joulanda A M Rawis[1], Jeffry S J Lengkong[1]

[1]Doctoral Program in Educational Management, Graduate School, Universitas Negeri Manado, Indonesia

*Corresponding author: andriessantolengkong@gmail.com

ARTICLE INFO
Article history:
Received: April 28, 2026; Received in revised form: May 17, 2026; Accepted: May 28, 2026;
Available online: June 01, 2026;

ABSTRACT

Surgical residency education places learners in an unusually demanding learning environment in which clinical care, academic responsibility, operative exposure, research tasks, documentation, and personal recovery compete for limited time. This article analyzes adaptive time management strategies used by surgical residents in a teaching hospital in Manado and formulates a contextual model for supporting professional learning and resident well-being. The study used a qualitative descriptive approach with in-depth interviews, observation, and documentation involving surgical residents, clinical supervisors, and a residency education coordinator. Thematic analysis identified three interrelated dimensions of time management: planning, implementation, and evaluation. Planning was characterized by adaptive daily prioritization, clinical urgency mapping, and individualized self-management tools. Implementation was characterized by flexibility in response to emergency cases, teamwork, micro-learning during clinical gaps, and adjustment to unpredictable clinical rhythms. Evaluation was carried out through personal reflection, peer feedback, and supervisor input, although institutional monitoring remained limited. The findings show that time management is not merely a technical scheduling activity but a professional self-regulation competence shaped by workload, clinical pressure, team culture, institutional support, and adult learning experience. The article proposes an adaptive-reflective time management model that integrates strategic clinical prioritization, flexible time blocking, integrated clinical learning, reflective practice, supervisor coaching, and system-level policy feedback. The model contributes to clinical education management by positioning time management as a humanistic and sustainable strategy for improving learning effectiveness, professional identity formation, and resident well-being.

Keywords: clinical education, educational management, resident well-being, self-management, surgical residency, time management.

INTRODUCTION

Professional education is not a simple transfer of knowledge from educators to learners. It is a complex system of learning management that involves planning, organizing, implementing, evaluating, and continuously developing human resources in a particular professional context. Surgical residency education represents one of the most complex forms of professional education because it occurs inside a real health service environment where residents act simultaneously as learners, clinicians, team members, researchers, and future specialists. This dual identity creates a demanding learning ecology in which time becomes one of the most strategic resources for professional development.

In surgical residency, time is not only a chronological measure but a scarce educational resource. Residents must allocate time for ward rounds, emergency surgery, elective operations, outpatient care, academic discussions, research, documentation, and self-study. These tasks rarely occur in a linear or predictable sequence. Emergency cases may interrupt scheduled learning, patient care may extend beyond planned hours, and administrative responsibilities may reduce opportunities for reflection. Therefore, the capacity to manage time becomes a core component of self-management and professional learning.

From the perspective of educational management, time management is not limited to preparing schedules or completing tasks quickly. It reflects the learner's ability to set priorities, control attention, make decisions under pressure, evaluate the use of time, and adapt to the changing demands of the clinical learning environment. It also reflects the quality of the institutional system in which the learner is placed. A resident with strong self-regulation may still experience difficulty if the education system provides excessive workload, unclear supervision, or an unpredictable schedule without adequate support.

Internationally, residency programs have increasingly recognized the importance of working-hour regulation and resident well-being. Policies such as duty-hour limits in the United States and Europe indicate that time management is not only an individual responsibility but also an institutional design issue. However, in many clinical education settings, especially in developing health systems, residents still rely heavily on personal coping strategies and informal peer support to survive demanding schedules. This situation makes it necessary to understand how residents actually plan, implement, and evaluate their use of time in daily practice.

The context of a teaching hospital in Manado is important because it combines a high clinical case volume with the educational function of preparing surgical specialists. The hospital functions as both a referral center and a clinical learning environment. Such a context offers rich opportunities for workplace-based learning, but it also exposes residents to heavy clinical duties, sudden schedule changes, documentation burdens, and limited protected study time. Understanding time management in this setting can contribute to the development of more adaptive, humanistic, and sustainable clinical education management.

The urgency of this study lies in the gap between the demands of surgical residency and the systematic development of non-technical competencies. Residency curricula often emphasize clinical skills, operative competence, and medical knowledge, while self-management competencies such as time management, prioritization, and reflective practice are not always explicitly taught. Consequently, residents may develop strategies intuitively through trial and error rather than through guided educational support. This article therefore examines the strategies used by surgical

residents and formulates a model that can be used by educators and institutions to strengthen learning effectiveness and resident well-being.

LITERATURE REVIEW

Educational management is a systematic process for managing educational resources so that learning objectives are achieved effectively and efficiently. In contemporary literature, educational management has moved from a purely administrative orientation toward a strategic and transformational orientation that places learning quality at the center of institutional governance (Bush, 2020; Hallinger, 2018). In professional education, the management process must accommodate not only curriculum and assessment but also the learner's workplace experience, psychological safety, supervision, and self-directed learning.

In the context of professional and clinical education, educational management requires a balance between service demands and learning needs. A hospital that functions as a teaching institution must simultaneously ensure patient safety, clinical service quality, and resident learning. This dual function creates tension, because the time needed for patient care can compete with the time needed for reflection, academic discussion, and research. Frenk et al. (2015) argue that health professional education requires stronger integration between education systems and health systems so that learning is not separated from real service needs.

The citation statement included in the source materials strengthens this educational management perspective. Lumapow et al. (2024) view talent management in education as a strategic approach to developing individual potential systematically, including adaptation, decision making, and time management. Rawis et al. (2024) emphasize that student management affects learning outcomes because learner services, discipline, guidance, and academic support are managed in a planned manner. Katuuk et al. (2025) regard program evaluation as a strategic basis for curriculum management to optimize learning, correct implementation weaknesses, and improve outcomes. Tambingon et al. (2025) frame educational human resource management as a strategic effort to develop talent, competence, and leadership in educational organizations. These perspectives justify the positioning of time management as part of learner development rather than merely a private habit.

Time management is commonly defined as the process of planning, organizing, and controlling the use of time to increase effectiveness and efficiency. Macan (1994) argues that time management includes setting goals, prioritizing tasks, and controlling interruptions. More recent views emphasize that time management is adaptive rather than rigid, especially in dynamic work environments (Claessens et al., 2017). In clinical education, this adaptive view is particularly relevant because residents must constantly adjust their plans to emergency cases, operative schedules, patient conditions, and supervisor decisions.

Several theories help explain time management in professional learning. The Eisenhower matrix distinguishes activities based on urgency and importance, helping learners avoid being controlled only by urgent tasks (Covey, 2016). The Pareto principle suggests that a small number of high-value activities may produce most learning outcomes (Koch, 2015). Time blocking encourages individuals to allocate time intentionally for focused tasks (Newport, 2016). Self-regulated learning theory explains how learners plan, monitor, and evaluate their learning behavior (Zimmerman, 2015). Together, these theories provide a conceptual foundation for understanding how surgical residents manage learning in the midst of clinical responsibility.

Adult learning theory is also relevant because residents are adult learners who bring motivation, experience, professional identity, and responsibility into the educational process

(Knowles, Holton, & Swanson, 2015). They do not learn only from formal lectures but from real clinical cases, supervisor feedback, peer collaboration, and reflection on mistakes. Experiential learning theory emphasizes that learning develops through concrete experience, reflective observation, conceptualization, and active experimentation (Kolb, 2015). In surgical residency, the operating room, ward, and emergency unit become learning spaces, but only when residents have enough time and support to transform experience into competence.

Resident well-being is an essential part of time management. Studies on medical training show that excessive workload, lack of control over time, sleep deprivation, and limited recovery increase the risk of burnout (Dyrbye et al., 2014; West et al., 2018). Burnout can reduce learning motivation, impair clinical judgment, and weaken professional identity formation. Therefore, a model of time management in surgical residency must include not only productivity but also well-being, reflection, and sustainability. See figure 1.

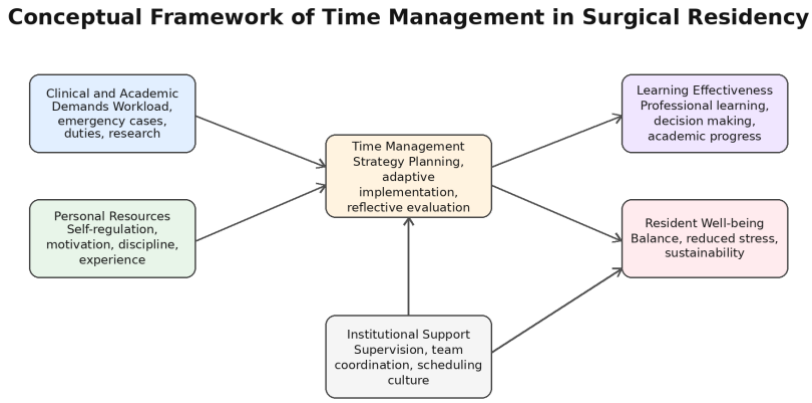

Figure 1. English-converted conceptual framework derived from the dissertation framework.

METHOD

This article is based on a qualitative descriptive study designed to understand the lived strategies of surgical residents in managing time during specialist education. A qualitative design was appropriate because the central phenomenon involved subjective experience, contextual adaptation, and meaning-making rather than the measurement of predetermined variables. The study focused on planning, implementation, evaluation, and the formulation of a contextual model of time management strategies in surgical residency education.

Data were obtained through in-depth interviews, observation, and document review. The informants consisted of surgical residents as main informants, clinical supervisors as supporting informants, and a residency education coordinator who provided institutional context. Residents were selected because they directly experience the competing demands of clinical service and academic learning. Supervisors were involved to provide perspectives on resident behavior, institutional expectations, and educational support. The coordinator provided information related to scheduling, policy, and the structure of the residency program.

The analysis followed thematic procedures consisting of data reduction, coding, categorization, theme synthesis, and conclusion drawing. The coding process moved from open coding to axial coding and selective coding. To strengthen credibility, triangulation was conducted by comparing resident narratives, supervisor observations, and documentation. The analysis was

organized around four research concerns: planning strategies, implementation strategies, evaluation strategies, and model formulation. See table 1.

Table 1. Research informants and their roles

Category of informant	Code	Number	Role in the study
Surgical residents	R1-R10	10	Provided primary data on experiences, strategies, barriers, and evaluation of time management.
Clinical supervisors	S1-S5	5	Provided institutional and supervisory perspectives on resident time management behavior.
Residency education coordinator	K1	1	Provided information on scheduling, education policy, and organizational context.
Total	-	16	Data were triangulated across learner, supervisor, and coordinator perspectives.

RESULTS AND DISCUSSION

The findings show that time management strategies among surgical residents were organized around three interrelated dimensions: planning, implementation, and evaluation. These dimensions were not linear stages that occur once, but recurring cycles that residents use every day. Residents typically begin the day by assessing clinical priorities, adjust their plans during unpredictable clinical activities, and review their performance informally at the end of the day or week. The recurring nature of these strategies indicates that time management in residency is adaptive and reflective rather than fixed.

The first dimension is planning. Residents did not describe planning as a rigid schedule made far in advance. Instead, planning was described as a daily and situational process. Many residents prepared a mental or written list of tasks each morning based on patient conditions, operating schedules, ward needs, academic assignments, and urgent instructions from supervisors. Clinical tasks were consistently placed above academic tasks because patient safety and surgical responsibility were viewed as immediate professional obligations. This pattern indicates that planning in surgical residency is shaped by clinical priority rather than by personal preference.

Several residents used simple self-management tools such as a to-do list, notes on mobile phones, reminders, or informal checklists. These tools helped them avoid forgetting tasks, especially when clinical duties overlapped. However, the tools were not always formalized by the program. Residents developed them independently as survival strategies. Senior residents appeared to plan more efficiently than junior residents because they had learned from experience which tasks required immediate attention and which could be postponed without harming patient care or learning.

The second dimension is implementation. Implementation was characterized by flexibility. Residents often had to abandon their original plans when emergency surgery, sudden patient deterioration, additional duties, or supervisor instructions emerged. Time management was therefore implemented through continuous adjustment rather than strict compliance with a schedule. Residents who were more successful in managing time were those who could quickly

reclassify tasks, coordinate with peers, ask for help, and use short intervals for learning or documentation.

Teamwork was a major factor in implementation. When communication among residents was strong, tasks could be shared more fairly and time pressure could be reduced. Peer support allowed residents to cover each other during urgent clinical duties, discuss cases briefly, and remind each other about academic obligations. Conversely, weak communication or unclear delegation increased inefficiency. This finding shows that time management is not entirely individual; it is embedded in the social organization of the surgical team.

The third dimension is evaluation. Residents evaluated time use through personal reflection, comparison with daily targets, feedback from supervisors, and informal discussion with peers. The evaluation process was often not documented, but it influenced future planning. Residents learned from days when they were overwhelmed, made errors in prioritization, missed academic tasks, or lacked rest. Reflection helped them identify the need to wake earlier, prepare cases in advance, complete documentation sooner, or ask for support when duties became excessive.

The findings also identify factors influencing the effectiveness of time management. At the individual level, self-discipline, motivation, clinical experience, priority-setting ability, and emotional control were important. At the social level, teamwork, communication, peer mentoring, and supervisor support shaped residents' ability to use time effectively. At the educational level, supervision, integration of learning into clinical duties, and feedback were crucial. At the organizational level, scheduling systems, workload, institutional culture, and policy support either strengthened or weakened residents' strategies. See table 2, 3, 4, and figure 2, 3.

Table 2. Thematic synthesis of findings

Dimension	Main empirical themes	Interpretation in educational management
Planning	Adaptive daily planning, clinical priority, to-do list, seniority-based efficiency	Planning is contextual and must respond to the immediate clinical learning environment.
Implementation	Flexible adjustment, teamwork, task sorting, use of waiting time for micro-learning	Implementation requires adaptive self-management and team-based coordination.
Evaluation	Reflection, supervisor feedback, peer discussion, correction of ineffective routines	Evaluation is a reflective mechanism for continuous improvement.
Determinant factors	Workload, clinical pressure, support, self-regulation, institutional schedule	Time management is influenced by both individual competence and system design.

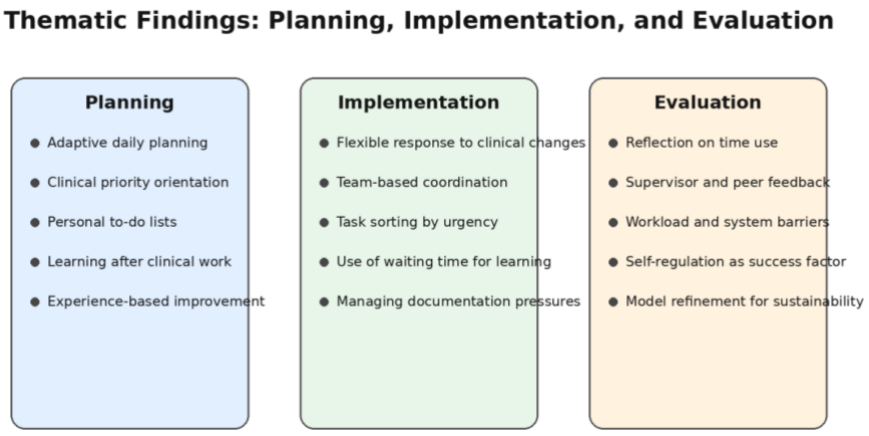

Figure 2. English-converted thematic findings from the dissertation results.

Table 3. Planning-related themes and implications

Selective theme	Description	Practical implication
Adaptive planning strategy	Residents plan daily activities according to clinical conditions rather than fixed timetables.	Programs need flexible planning templates and daily briefing routines.
Dominance of clinical demands	Patient care and operations are consistently prioritized over academic activities.	Academic learning should be integrated into clinical duties through micro-learning.
Resident self-management	Residents use individual tools such as notes, checklists, and reminders.	Self-management training should be explicitly included in residency orientation.
Time competence development	Planning improves through experience and seniority.	Mentoring from senior residents can accelerate adaptation for junior residents.
Institutional dependency	Resident strategies are affected by scheduling, supervision, and workload.	Time management should be supported by program-level policy, not only individual discipline.

Table 4. Factors affecting successful time management

Category of factor	Sub-factors	Educational meaning
Individual	Discipline, motivation, priority setting, clinical experience	Time management is a professional self-regulation competence.
Social	Team support, mentoring, communication	A collaborative learning climate strengthens individual strategies.
Educational	Supervision, clinical learning integration, feedback	Supervisors shape the quality of resident reflection and learning.
Organizational	Schedule system, workload, institutional culture, policy	The institution creates the conditions in which individual strategies succeed or fail.

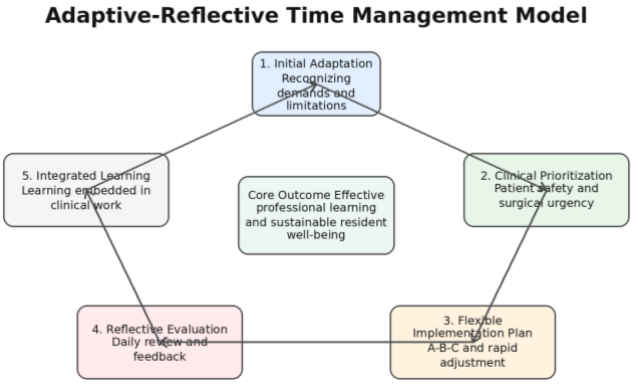

Figure 3. English-converted model of adaptive-reflective time management.

The findings confirm that time management in surgical residency is best understood as a competence of professional self-regulation. The residents did not simply manage hours; they managed uncertainty, responsibility, learning opportunities, and personal energy. This finding is consistent with self-regulated learning theory, which views effective learners as individuals who plan, monitor, and evaluate their own learning process (Zimmerman, 2015). In the residency context, self-regulation is expressed through prioritization of patient care, rapid adjustment to clinical changes, and reflective correction of routines.

The planning dimension shows that surgical residents operate in a learning environment where the ideal schedule is frequently disrupted by clinical reality. Therefore, conventional time management based on fixed calendars may be insufficient. The residents' planning was more similar to adaptive planning: they identified priorities, prepared for likely tasks, and kept space for unexpected events. This supports the view that professional education requires flexible management systems rather than rigid administrative control (Bush, 2020; Hallinger, 2018). In surgical education, planning should include protected learning time but also realistic mechanisms for responding to emergency service demands.

Clinical priority dominated resident planning. This is professionally appropriate because patient safety is central to surgical education. However, if all educational tasks are continuously postponed after clinical duties, residents may experience academic delay, research pressure, and reduced reflection. The challenge for educational management is to integrate learning into service rather than treating learning as an activity that occurs only after clinical work is finished. Workplace-based learning and experiential learning support this integration because they view clinical activity itself as a source of learning when it is accompanied by feedback and reflection (Kolb, 2015; Yardley et al., 2017).

The implementation dimension highlights the importance of adaptive expertise. Residents often encounter schedule changes, emergency surgery, and competing demands. A resident who applies a rigid schedule may become frustrated when plans fail, whereas an adaptive resident can re-rank tasks quickly and use available intervals productively. This finding aligns with contemporary time management theory, which emphasizes adaptability and control over attention rather than mere clock-based discipline (Claessens et al., 2017). Adaptive time management in residency should therefore be taught through clinical scenarios, simulation of workload changes, and supervisor-guided decision making.

The importance of teamwork demonstrates that time management is socially constructed. Residents do not work alone. Their time is shaped by supervisors, peers, nurses, patients, operating room schedules, and institutional rules. When teamwork is strong, time pressure can be distributed and learning can be maintained. When communication is weak, time is wasted through duplication,

unclear delegation, or delayed information. This finding supports social learning theory because residents learn time management norms by observing seniors, receiving feedback, and participating in team routines (Bandura, 2018).

Evaluation through reflection was a crucial but still informal component. Residents learned from difficult days, missed tasks, and feedback, yet the program did not appear to have a fully formal reflective monitoring system. This suggests that educational management should provide structured reflection tools such as weekly logs, supervisor check-ins, and portfolio-based review. Katuuk et al. (2025) emphasize program evaluation as a strategic basis for improving curriculum and learning outcomes. In the context of residency, evaluation should not only measure operative exposure or academic scores; it should also monitor the sustainability of resident workload and self-management development.

The findings also support the importance of talent and human resource management in education. Lumapow et al. (2024) argue that talent management develops individual potential systematically, including adaptation and decision-making capacity. Surgical residents are not only trainees in technical surgery; they are developing professional talent who need structured support for self-management. Tambingon et al. (2025) similarly position educational human resource management as a strategic effort to strengthen competence and leadership. Time management training can therefore be framed as part of human resource development in clinical education.

Rawis et al. (2024) emphasize that student management influences learning outcomes through planned services, discipline, guidance, and academic support. This statement is highly relevant to residency education because residents are students in a professional clinical system. Their learning outcomes depend not only on personal effort but also on the quality of services and supports provided by the program. If institutions expect residents to manage time effectively, they must also provide clear schedules, fair distribution of duties, accessible supervision, and a culture that values learning and well-being.

The proposed model integrates six strategic elements. First, strategic clinical prioritization helps residents classify tasks based on urgency, importance, and learning value. Second, adaptive time management encourages flexible plan A-B-C strategies for unpredictable clinical schedules. Third, integrated clinical learning transforms clinical work into learning through micro-discussion, bedside teaching, and reflection. Fourth, self-regulation and reflective practice support daily review and personal improvement. Fifth, team-based time support strengthens peer coordination and supervisor coaching. Sixth, institutional policy feedback ensures that individual experiences inform scheduling and curriculum improvement.

This model contributes to educational management by connecting individual self-management with system-level responsibility. It avoids blaming residents for time difficulties that are partly produced by workload and institutional design. At the same time, it recognizes that residents need personal strategies because clinical environments will never be fully predictable. The model is therefore adaptive, reflective, contextual, and humanistic. It supports professional learning effectiveness while protecting resident well-being. See table 5, and figure 4.

Table 5. Strategy model for time management in surgical residency

Model strategy	Purpose	Concrete practice	Suggested intervention	Theoretical basis
Strategic clinical prioritization	Classify tasks by urgency, patient safety, and learning value	Daily checklist; A-D priority classification; early shift briefing	Priority-setting workshop and case-based discussion	Professional identity formation; clinical reasoning (Cruess et al., 2019;

Model strategy	Purpose	Concrete practice	Suggested intervention	Theoretical basis
				Ten Cate et al., 2018)
Adaptive time management	Develop flexibility when clinical schedules change	Plan A-B-C; flexible time blocks; rapid re-prioritization	Simulation-based workload scenario and crisis management training	Adaptive expertise and flexible time management (Mylopoulos & Woods, 2018; Claessens et al., 2017)
Integrated clinical learning	Embed learning within service activities	Micro-learning; bedside teaching; post-procedure discussion	Training for clinical supervisors in workplace-based learning	Experiential learning and workplace-based learning (Kolb, 2015; Billett, 2016)
Self-regulation and reflective practice	Strengthen personal evaluation and continuous improvement	Daily self-review; reflection log; weekly evaluation	Reflective journaling and supervisor coaching	Self-regulated learning and reflective practice (Zimmerman, 2015; Sandars & Cleary, 2016)
Team-based time support	Use collaboration to reduce overload and improve communication	Delegation, peer reminders, shared task board	Peer mentoring and team communication training	Social learning and educational leadership (Bandura, 2018; Hallinger, 2018)
Institutional policy feedback	Connect resident experience to curriculum and scheduling reform	Periodic workload review; scheduling audit; feedback forum	Program evaluation meeting and policy improvement cycle	Educational management and program evaluation (Bush, 2020; Katuuk et al., 2025)

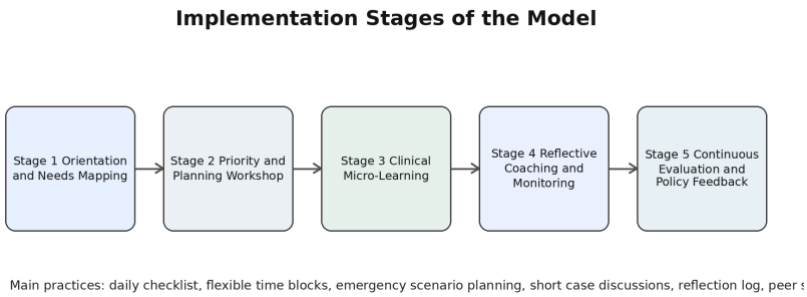

Figure 4. English-converted implementation stages of the model.

Practical Implications for Clinical Education Management

The practical implication of the findings is that residency programs need to recognize time management as part of the formal curriculum of professional development. Orientation for junior residents should not only introduce clinical rules and operative requirements but also train residents to identify priorities, use checklists, manage interruptions, and evaluate daily workload. Such

training can reduce the chaotic adaptation period commonly experienced at the beginning of residency.

Supervisors also need practical tools to support resident time management. Short debriefings after operative sessions, weekly feedback on workload, and guided reflection can help residents transform experience into learning. Supervisors can model professional prioritization by explaining why certain tasks are urgent, how to balance documentation with patient care, and how to protect time for academic growth. This form of role modeling is especially important in surgical education, where much learning occurs through observation and apprenticeship.

At the institutional level, programs should develop scheduling policies that are transparent, flexible, and responsive to workload data. A scheduling system that ignores emergency burden, documentation requirements, and academic tasks may unintentionally create conditions for burnout. Periodic workload review can help program leaders identify patterns of excessive demand and redesign rotations. Technology can also support the process through digital calendars, shared duty boards, learning management systems, and reflection portfolios.

Theoretical Contribution

Theoretically, the study expands the concept of time management from an individual productivity technique into a construct of educational management. In many management texts, time management is discussed as a personal skill. The findings of this study show that in clinical education, time management is produced through interaction between individual self-regulation, team culture, supervision, and institutional structure. This perspective broadens the analysis of time management by connecting it with adult learning, experiential learning, organizational learning, and human resource development.

The adaptive-reflective model also contributes to competency-based medical education. Competency-based education requires learners to demonstrate not only technical ability but also professionalism, communication, systems awareness, and practice-based learning. Time management supports all of these competencies. A resident who cannot prioritize clinical tasks, manage learning opportunities, or reflect on performance may struggle to develop professional competence even if clinical exposure is abundant. Therefore, time management should be viewed as a cross-cutting competency in surgical education.

The integration of citation sources from the citation statement strengthens the local theoretical grounding of the model. Lumapow et al. (2024), Rawis et al. (2024), Katuuk et al. (2025), and Tambingon et al. (2025) collectively emphasize talent development, student management, curriculum evaluation, and educational human resource management. These concepts align with the empirical finding that resident time management develops through individual capacity, educational support, program evaluation, and institutional commitment.

Proposed Programmatic Interventions

The organizational environment also matters. Scheduling systems, duty distribution, documentation requirements, and institutional expectations can either support or undermine individual strategies. When duties are distributed without considering workload intensity, even disciplined residents may struggle. When academic activities are scheduled without coordination with clinical responsibilities, residents may experience conflict between learning and service. Thus, the institution has a responsibility to design a learning system that makes effective time management possible.

The social environment strongly influences time management. Residents depend on peers to exchange information, divide tasks, and maintain continuity of patient care. In a supportive team,

residents can protect learning time because colleagues help balance urgent responsibilities. In a weak team, individual residents may experience overload. Therefore, time management is not purely a personal skill; it is also a collective practice shaped by team communication, trust, and shared responsibility.

The role of the supervisor is critical in the evaluation stage. A supervisor who provides constructive feedback can help residents understand not only what was done incorrectly but also how time was allocated in ways that contributed to the problem. For example, a supervisor can discuss why a resident delayed documentation, why a case preparation was incomplete, or why a clinical task was not delegated. Such feedback transforms time management from a hidden personal issue into an explicit learning objective.

Evaluation occurs through both conscious reflection and informal emotional feedback. Residents know that a day has gone poorly when tasks accumulate, learning is postponed, documentation remains unfinished, or fatigue becomes excessive. They then adjust their strategies by preparing earlier, delegating more effectively, writing reminders, or communicating with peers. This reflective process resembles a cycle of continuous improvement, but because it is mostly informal, its quality depends on individual awareness. Structured reflective tools would make the evaluation process more equitable and educationally meaningful.

The implementation data also show that residents use micro-time. Waiting time before procedures, short intervals between patient care, and moments after rounds become opportunities for reading, checking references, preparing presentations, or discussing cases with peers. This finding is important because it shows that learning does not always require long uninterrupted time blocks. In a busy residency, learning often occurs in small fragments. However, micro-learning is effective only when residents know what to learn and when supervisors help connect small experiences to larger competencies.

Implementation of time management shows a strong element of improvisation. Residents often implement their plans while simultaneously revising them. Emergency surgery, changes in operating room availability, patient deterioration, or additional requests from supervisors may alter the entire day. The most effective residents are those who maintain a flexible framework rather than a rigid schedule. Their strategy is to keep a sequence of priorities but remain ready to move tasks into different time slots. This practical flexibility is an essential feature of time management in clinical education.

The planning strategy used by residents can be described as clinical-priority planning. The residents assess which patients require immediate attention, which procedures must be prepared, which documentation must be completed, and which academic tasks can be done later. Although this strategy is practical, it depends heavily on the resident's experience. Junior residents often face difficulty because they perceive many tasks as equally urgent. Senior residents, by contrast, are more able to identify the consequences of delaying a task. This finding suggests the need for explicit mentoring in priority judgment during early residency.

The empirical data indicate that planning in surgical residency begins with a realistic acceptance that a perfect schedule is rarely possible. Residents do not start the day with a fully stable agenda; rather, they start with a hierarchy of possible duties. The highest level of priority is always patient safety and operative responsibility. Academic activities are then negotiated around this core duty. This pattern reflects a professional culture in which residents internalize that patient care is the center of their role, but it also creates a risk that academic learning becomes reactive rather than planned if the institution does not provide protected learning mechanisms.

Detailed Synthesis of Empirical Dimensions

Finally, the model has value for broader health professional education. Although the empirical context is surgical residency, similar problems occur in emergency medicine, obstetrics, internal medicine, intensive care, and other clinical training environments. Learners in these settings also face unpredictable schedules, high workload, emotional pressure, and competing academic responsibilities. Therefore, the adaptive-reflective approach can be adapted by other programs that seek to strengthen professional learning while maintaining learner well-being.

The model proposed in this article also encourages a shift from reactive education toward proactive education. Rather than waiting until resident's experience burnout or academic delay, programs can anticipate time-management difficulties from the beginning. Early diagnosis of workload problems, regular dialogue between residents and supervisors, and curriculum-based self-management training can prevent many avoidable difficulties. This proactive stance is consistent with educational management principles that emphasize planning, monitoring, and continuous improvement.

Sustainability is another important implication. Surgical residency is a long educational journey, and strategies that depend solely on endurance may not be sustainable. Residents may succeed temporarily by sacrificing sleep, family time, and reflection, but such strategies can weaken long-term learning and professional identity. Sustainable time management should include rest, recovery, and reflection as legitimate elements of professional development. This view does not reduce the seriousness of surgical training; instead, it strengthens the capacity of residents to remain competent, ethical, and emotionally stable in high-pressure environments.

A humanistic approach to residency education requires institutions to recognize that residents are not merely service providers or passive trainees. They are adult learners who need opportunities to plan, act, receive feedback, and recover. When time management is interpreted only as the resident's personal responsibility, institutional factors such as scheduling overload, unclear delegation, and insufficient supervision may remain invisible. A humanistic management approach therefore places responsibility at two levels: residents must develop self-regulation, and institutions must design conditions that support healthy self-regulation.

Implications for Humanistic and Sustainable Residency Education

The value of the model lies in its practicality. It does not demand that clinical education become predictable, because surgical care will always involve uncertainty. Instead, it asks the program to prepare residents to act intelligently within uncertainty and to create a system that does not punish learners for circumstances beyond their control. In this sense, the model bridges individual professionalism and organizational responsibility. It respects the demanding nature of surgical training while insisting that demanding education can still be organized in a reflective, supportive, and sustainable way.

Residency program leaders should translate the adaptive-reflective model into policy instruments that are simple, measurable, and compatible with clinical realities. The first policy recommendation is to establish protected reflective time at least once a week. This period may be short, but it should be formally recognized so that residents can evaluate cases, record learning points, and discuss time-management barriers with supervisors. The second recommendation is to include time-management indicators in resident mentoring. These indicators may include punctual completion of documentation, ability to prioritize urgent cases, participation in academic sessions, and evidence of reflective learning. The third recommendation is to create a feedback channel from residents to program managers concerning workload distribution and schedule unpredictability. Such feedback should be treated as curriculum data rather than complaints. The fourth

recommendation is to develop supervisor capacity in coaching non-technical skills, because residents learn time management not only from formal instruction but also from the example and expectations of senior clinicians. The fifth recommendation is to ensure that any digital scheduling tool is accompanied by human discussion and policy response. Data without dialogue may increase surveillance, whereas data with dialogue can improve educational quality. Through these recommendations, time management can become an institutional culture of learning rather than an isolated personal struggle.

CONCLUSION

This article concludes that surgical residents manage time through adaptive, flexible, and reflective strategies shaped by both personal and institutional factors. The planning stage is characterized by daily priority setting, clinical urgency mapping, and individual self-management tools. The implementation stage is characterized by flexible adjustment to emergency cases, teamwork, and integration of learning into clinical work. The evaluation stage is characterized by personal reflection, peer discussion, and supervisor feedback, although structured institutional evaluation still needs strengthening. The study demonstrates that time management in surgical residency is not merely a technical scheduling skill. It is a professional self-management competence that supports learning effectiveness, clinical responsibility, decision making, and well-being. Residents develop this competence through experience, but the process can be accelerated and made more equitable through structured educational support. The proposed adaptive-reflective time management model integrates strategic clinical prioritization, adaptive scheduling, workplace-based micro-learning, reflective practice, team support, and institutional policy feedback. For residency programs, the main recommendation is to include time management as an explicit component of professional development. Orientation, mentoring, supervision, scheduling review, and reflective portfolios can be used to strengthen residents' ability to manage time. For hospital leadership, the recommendation is to recognize that resident time is both a service resource and an educational resource. Sustainable clinical education requires a balance between patient care, learning, and resident well-being.

Another future direction is to examine the relationship between time management and patient safety. Residents who manage time well may be better prepared, less fatigued, and more attentive during clinical tasks. However, this relationship needs empirical investigation. Research can also explore how digital scheduling systems, electronic medical records, and administrative workload influence residents' ability to learn. These issues are increasingly important as clinical education becomes more technologically mediated and administratively complex. Future research can test the model through mixed-method or intervention studies. For example, a program may introduce a time management workshop, reflective log, and supervisor coaching, then measure changes in perceived control of time, stress, academic task completion, clinical performance, and resident well-being. Comparative studies across hospitals would also be useful to examine how institutional culture affects resident time management. Such research would strengthen the evidence base for integrating self-management competence into residency curricula.

This article is based on qualitative data from one teaching hospital context. The findings provide depth and contextual understanding, but they are not intended to be generalized statistically to all residency programs. Different surgical departments may have different cultures, caseloads, supervisory styles, and scheduling systems. Nevertheless, the model proposed in this article can serve as an analytical framework for other institutions that face similar challenges in balancing clinical service and resident learning.

Limitations and Future Research

Based on the findings, a residency program can develop several programmatic interventions. First, junior residents should receive structured training on clinical prioritization at the beginning of residency. This training should use real case scenarios and ask residents to classify activities by urgency, importance, patient safety risk, and educational value. The objective is not to eliminate uncertainty but to help residents think clearly when several tasks compete for attention.

Second, the program can implement a daily or weekly reflective log. The log does not need to be lengthy. It may include three questions: What was the most important clinical priority today? What time management difficulty occurred? What improvement will be tried tomorrow? This simple instrument can develop reflective practice, allow supervisors to identify recurring problems, and create data for program improvement. It can also help residents recognize patterns of overwork before they become burnout.

Third, supervisors can incorporate time management into bedside teaching and case discussions. After discussing diagnosis or operative technique, supervisors can ask residents how they prepared the case, how they allocated time, and what alternative strategy could be used in a busy schedule. This approach integrates non-technical competence into clinical teaching without requiring a separate course. It also communicates to residents that time management is part of professionalism.

Fourth, the program can create a peer mentoring system. Senior residents can guide junior residents in practical strategies such as preparing for rounds, managing documentation, coordinating with the operating room, balancing academic requirements, and protecting rest. Peer mentoring is valuable because senior residents understand the practical realities of the program and can translate institutional expectations into daily routines.

Fifth, institutional leaders should conduct periodic scheduling audits. These audits can compare planned schedules with actual clinical demands, identify peak workload periods, and assess whether academic activities are realistically placed. The results can be used to adjust rotations, redistribute tasks, and strengthen supervision. This intervention aligns with the view that program evaluation should function as a basis for curriculum and organizational improvement (Katuuk et al., 2025).

Sixth, digital tools can be used to support coordination. A shared digital task board, learning management system, or mobile schedule application can reduce information gaps and make duties more transparent. However, technology should not be introduced merely as an administrative burden. It should simplify communication, reduce duplication, and support reflection. In this way, technology becomes part of educational management rather than another demand on residents' time.

REFERENCES

ACGME. (2011). Common program requirements: Resident duty hours in the learning and working environment.

Aeon, B., & Aguinis, H. (2017). It is about time: New perspectives and insights on time management. Academy of Management Perspectives, 31(4), 309-330.

Bandura, A. (2018). Toward a psychology of human agency: Pathways and reflections. Perspectives on Psychological Science, 13(2), 130-136.

Billett, S. (2016). Learning through health care work: Premises, contributions and practices. Medical Education, 50(1), 124-131.

Bush, T. (2020). Theories of educational leadership and management. SAGE.

Claessens, B. J. C., van Eerde, W., Rutte, C. G., & Roe, R. A. (2017). A review of time management literature. Personnel Review, 36(2), 255-276.

Cook, D. A., Artino, A. R., & Sandars, J. (2019). Motivation to learn: An overview of contemporary theories. Medical Education, 53(5), 432-442.

Covey, S. R. (2016). The 7 habits of highly effective people. Simon & Schuster.

Cruess, R. L., Cruess, S. R., & Steinert, Y. (2019). Supporting the development of a professional identity: General principles. Medical Teacher, 41(6), 641-649.

Dyrbye, L. N., et al. (2014). Burnout among medical students, residents, and early career physicians. Academic Medicine, 89(3), 443-451.

Frenk, J., et al. (2015). Health professionals for a new century: Transforming education to strengthen health systems. The Lancet, 376(9756), 1923-1958.

Greenberg, C. C., et al. (2016). Surgical coaching for individual performance improvement. Annals of Surgery, 263(2), 207-212.

Hallinger, P. (2018). Bringing context out of the shadows of leadership. Educational Management Administration & Leadership, 46(1), 5-24.

Häfner, A., Stock, A., Pinneker, L., & Ströhle, S. (2015). Stress prevention through a time management training intervention. Educational Psychology, 35(1), 1-18.

Katuuk, D. A., Masinambow, C. J. R., Marsumi, Munir, S., & Wakerkwa, T. (2025). Strategi manajemen kurikulum berbasis evaluasi program untuk optimalisasi pembelajaran. Jurnal Ilmiah Wahana Pendidikan.

Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). The adult learner: The definitive classic in adult education and human resource development. Routledge.

Koch, R. (2015). The 80/20 principle: The secret to achieving more with less. Nicholas Brealey.

Kolb, D. A. (2015). Experiential learning: Experience as the source of learning and development. Pearson.

Lumapow, H. R., Gaspersz, S., Panjaitan, J., Kerap, T. G., Hatibie, M. J., & Oley, M. C. (2024). Pentingnya manajemen talenta dalam pendidikan: Studi literatur. Jurnal Pendidikan Indonesia, 5(12), 820-828.

Macan, T. H. (1994). Time management: Test of a process model. Journal of Applied Psychology, 79(3), 381-391.

Mylopoulos, M., & Woods, N. N. (2018). Preparing medical students for future learning using basic science instruction. Medical Education, 48(7), 667-673.

Newport, C. (2016). Deep work: Rules for focused success in a distracted world. Grand Central Publishing.

Rawis, J. A. M., Tambingon, H. N., Lengkong, J. S. J., Qowi, M., Tendean, S. D., Manumpil, Y. B., & Namsa, Y. (2024). The influence of student management on students' learning outcomes. International Journal of Information Technology and Education.

Sandars, J., & Cleary, T. J. (2016). Self-regulation theory: Applications to medical education. AMEE Guide No. 58. Medical Teacher, 33(11), 875-886.

Schön, D. A. (2017). The reflective practitioner: How professionals think in action. Routledge.

Tambingon, H. N., Sampouw, N. L., et al. (2025). Manajemen sumber daya manusia pendidikan: Strategi pengembangan talenta dan kepemimpinan. CV Penerbit Lakeisha.

Ten Cate, O., et al. (2018). Entrustment decision making in clinical training. Academic Medicine, 91(2), 191-198.

West, C. P., Dyrbye, L. N., & Shanafelt, T. D. (2018). Physician burnout: Contributors, consequences and solutions. Journal of Internal Medicine, 283(6), 516-529.

Yardley, S., Teunissen, P. W., & Dornan, T. (2017). Experiential learning: Transforming theory into practice. Medical Teacher, 34(2), 161-164.

Zimmerman, B. J. (2015). Self-regulated learning: Theories, measures, and outcomes. International Encyclopedia of the Social & Behavioral Sciences.