

Festina Lente as a Behaviorally Oriented Self-Regulation Pattern Aligned with Metacognitive Principles in Higher Education

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ABSTRACT

Modern higher education increasingly emphasizes efficiency and rapid knowledge acquisition, often at the expense of reflection and depth of understanding. This study explores the ancient principle *festina lente* ("make haste slowly") as a pattern of learning-related behaviors aligned with principles of metacognitive self-regulation among university students. Participants completed a modified version of the Motivated Strategies for Learning Questionnaire (MSLQ) twice, reflecting their learning-related perceptions at the beginning and end of the semester. The instrument captured two dimensions of *festina lente*-related behaviors: (a) Academic Preparation (AP) and (b) Non-required Enrichment (NE). The results indicated statistically significant temporal increases in both AP and NE scores ($p < 0.05$), although effect sizes were small. Female students reported higher engagement in AP-related behaviors compared to male students, while no gender differences were observed in the NE dimension. These findings document exposure-based temporal patterns in learning behaviors conceptually aligned with metacognitive principles rather than evidence of strategy acquisition or metacognitive development. The study highlights the relevance of deliberate pacing and sustained engagement in higher education and suggests directions for future research combining behavioral indicators with direct measures of metacognitive regulation in larger and more diverse samples.

Keywords: Festina Lente, Metacognition, Self-regulated Learning, Higher Education, Learning Strategies, Pilot Study

INTRODUCTION

Modern education systems increasingly emphasize rapid information acquisition and accelerated learning trajectories, particularly in university settings, where students face growing pressure to master an expanding body of knowledge within compressed time frames. This acceleration paradoxically occurs alongside mounting evidence from cognitive and educational psychology indicating that slower, more deliberate approaches to learning often yield superior long-term outcomes (Abbasi & Alghamdi, 2015). The ancient principle of *festina lente* "make haste slowly", encapsulates this fundamental tension between speed and depth of learning and provides a valuable lens through which to examine how contemporary university students navigate the competing demands of efficiency and mastery.

Originating as the motto of the first Roman emperor, Augustus, *festina lente* highlighted the importance of thoughtful action over impulsive haste, emphasizing that nothing was less fitting for a leader than recklessness and rush (Suetonius, 1964). This oxymoron has since been interpreted across diverse disciplines, including medicine (Nostrand, 2016), where it symbolizes the balance between urgency and deliberation. Within the context of education, *festina lente* represents an enduring paradox: the need to progress while maintaining reflection, depth, and cognitive balance.

This paradox reflects deeper psychological processes governing attention allocation, cognitive resource management, and knowledge consolidation, domains where haste can

paradoxically undermine the very goals it seeks to achieve. Understanding *festina lente* as a psychological phenomenon requires examining how students balance the urgency of academic demands with the cognitive requirements of deep and lasting learning.

The tension between rapid information processing and meaningful learning is particularly evident in contemporary university education. Students today are exposed to an unprecedented volume of information delivered through digital platforms, leading to phenomena such as “brain drain,” where the constant presence of technological devices reduces available cognitive capacity for focused work. Research shows that smartphones occupy limited attentional resources through the effort required to suppress automatic attention to these stimuli, leaving fewer resources for academic tasks and thus reducing performance (Ward et al., 2017). The *festina lente* principle of intentional pacing may counteract such environmental fragmentation, preserving attentional focus and cognitive integrity.

From a cognitive perspective, slower pacing allows for elaborative encoding, schema integration, and conceptual understanding, processes that require time and depth. Studies on motor learning distinguish between “fast” and “slow” learning components, where initial practice yields immediate but modest gains, while substantial improvements emerge through slower consolidation during rest and sleep (Maquet et al., 2003). Cognitive load theory posits that working memory has a strictly limited capacity, and instructional conditions that exceed this capacity impair learning rather than enhance it (Sweller, 1988). Attempts to accelerate learning beyond an optimal pace may therefore overload cognitive systems and paradoxically reduce efficiency (Sweller et al., 2011; Hanham et al., 2023). When students rush, they engage in superficial processing that fails to create robust memory traces (Caplan et al., 2011), demonstrating how speed pressure fragments cognitive resources.

Self-regulated learning represents a crucial process underpinning *festina lente* strategies. Students who control their own learning pace exhibit higher metacognitive awareness and better academic outcomes compared to those reacting passively to external demands (Cho & Heron, 2015). Purposeful pacing supports goal-setting, planning, and self-monitoring, allowing strategic allocation of cognitive resources (Asikainen et al., 2017). Motivation further moderates the optimal learning pace, intrinsic motivation significantly enhances perceived learning outcomes (Liu et al., 2024), while extrinsic motivation demonstrates weaker or inconsistent links with achievement and satisfaction (Eom & Ashill, 2016; Habgood & Answorth, 2011). Slow, deliberate engagement itself can strengthen intrinsic motivation by fostering genuine interest and mastery orientation (Bandura & Schunk, 1981).

The emergence of generative artificial intelligence (AI) introduces new metacognitive challenges that demand greater self-regulation. Students must evaluate AI-generated content, assess reliability, and integrate it with prior knowledge (Tankelevitch et al., 2024). Although rapid access to information may seem to obviate the need for deep learning, it instead heightens the importance of metacognitive regulation to distinguish between information retrieval and genuine understanding (Graesser & McNamara, 2010).

Emotional regulation also plays a key role in balancing speed and comprehension under academic stress (Huang et al., 2020). The *festina lente* approach mitigates anxiety by reducing time pressure while maintaining structure and motivation. Students who adopt

slower, more reflective learning approaches report lower anxiety and greater self-confidence, which further enhance deep processing and retention ([Artino & Stephens, 2009](#)).

Assessment structures critically determine whether students prioritize depth or speed in learning. Predominantly summative assessment systems encourage strategic, performance-oriented behaviors, producing an “assessment race” in which students focus on grades rather than understanding ([Harland et al., 2014](#)). Conversely, formative assessment, providing continuous feedback without immediate grading consequences, supports festina lente learning by enabling students to regulate their pace, engage in reflection, and consolidate knowledge ([Higgins et al., 2010](#)). The shift from “assessment of learning” to “assessment for learning” aligns closely with the festina lente philosophy, emphasizing the process of learning itself over isolated performance outcomes ([Schuwirth & Vleuten, 2011](#)).

Neuropsychological perspectives further substantiate the principle. Attention and executive functions underpin deep learning by sustaining engagement and regulating cognitive resources ([Schroder et al., 2017](#)). Students with a growth mindset exhibit heightened error monitoring, promoting long-term development. Memory consolidation processes underscore the value of rest and reflection, as delayed improvements often emerge after offline processing periods ([Schmidt et al., 2015](#)). Thus, the neurocognitive basis of festina lente reinforces that effective learning requires cycles of activity and rest, rather than uninterrupted acceleration.

From a psychological standpoint, festina lente is not merely a time-management heuristic but a principle grounded in the architecture of human cognition. Limited working memory and attentional capacity impose natural constraints on how quickly meaningful learning can occur. Attempts to exceed these limits by rushing paradoxically reduce effectiveness and retention. Consequently, festina lente encapsulates an optimal balance between cognitive efficiency and reflective depth.

In the present study, festina lente is conceptualized not as a directly measured metacognitive strategy, but as a pattern of learning-related behaviors aligned with principles of metacognitive self-regulation. Metacognition, defined as the ability to monitor and evaluate one's cognitive processes and strategies during learning ([Škoda & Doulík, 2011](#)), consists of two components, metacognitive knowledge and experience ([Flavell, 1979](#)). This research focuses on metacognitive regulation, planning, revising learning goals, and adjusting strategies based on monitoring outcomes ([Schneider & Lockl, 2008](#)). Learning strategies, when intentionally structured, form coherent systems of action designed to achieve academic goals ([Škoda & Doulík, 2011](#)).

We define festina lente-related learning behaviors in education as voluntary, proactive effort exerted in advance of deadlines. Within university study, we distinguish two dimensions of festina lente-related learning behaviors:

- a) Academic preparation (AP): students complete required academic tasks voluntarily and with temporal foresight;
- b) Non-required enrichment (NE): students invest additional effort beyond formal preparation to acquire knowledge, skills, or professional connections unattainable through compulsory coursework alone.

The central aim of this study is to explore whether behavioral patterns conceptually aligned with the festina lente principle are present in students' self-directed learning and whether these patterns exhibit temporal change across one academic semester. The study is

intended as an exploratory, descriptive-developmental pilot investigation documenting behaviors consistent with metacognitive self-regulation, rather than as a test of causal strategy development or academic performance effects.

Although no explicit instructional intervention was implemented, theoretical perspectives on self-regulated learning suggest that repeated engagement with academic demands, feedback, and time-structured coursework may foster gradual changes in learning-related behaviors over the course of a semester. Previous research indicates that exposure to recurring study routines, assessment cycles, and self-monitoring demands can lead to incremental adjustments in how students plan, distribute, and regulate their learning efforts, even in the absence of targeted training. On this basis, the present study explores whether behaviors conceptually aligned with the festina lente principle exhibit temporal change across an academic semester.

Previous research suggests that gender differences in learning-related self-regulation behaviors may be associated with differences in academic engagement, time management, and study planning, with female students often reporting higher levels of preparatory and organizational behaviors in academic contexts. On this basis, the present study explores whether gender differences are observable in festina lente-related behaviors, particularly in the Academic Preparation dimension.

Based on the theoretical framework of metacognitive self-regulation and the festina lente principle, the following hypotheses were formulated:

- H1:** It is expected that students may show a statistically significant increase in behaviors associated with the festina lente principle related to academic preparation (AP) between the beginning and the end of the semester.
- H2:** It is expected that students may show a statistically significant increase in behaviors associated with the festina lente principle related to non-required enrichment activities (NE) between the beginning and the end of the semester.
- H3:** Female students are expected to report stronger engagement in AP-related festina lente behaviors than male students, while no gender difference is expected in the NE dimension.

METHODS OF RESEARCH

Research Aim

The present study aimed to identify and evaluate temporal changes in learning-related behaviors associated with the festina lente principle, specifically its Academic Preparation (AP) and Non-required Enrichment (NE) components, among university students across one academic semester. The study further examined whether these behaviors are conceptually aligned with patterns of self-regulation consistent with metacognitive principles.

Instrument

Data were collected using a modified version of the Motivated Strategies for Learning Questionnaire (MSLQ) developed by [Pintrich et al. \(1991\)](#). In this sense, the AP dimension operationalizes festina lente-related behaviors through established MSLQ learning strategy items, allowing the principle to be examined within a validated self-regulated learning framework without introducing a novel, untested instrument. The instrument was adapted to

reflect the conceptual dimensions of festina lente–related learning behaviors as defined in the theoretical framework. The reliability of the instrument was assessed using Cronbach’s alpha coefficient. The average Cronbach’s alpha value across all dimensions of the questionnaire was 0.88, indicating a high level of internal consistency and suggesting that the instrument as a whole was highly reliable. The content validity of the adapted questionnaire was evaluated by three experts from the Faculty of Education, Trnava University in Trnava, who reviewed the relevance, clarity, and alignment of all items with the conceptual framework of the festina lente principle and associated learning behaviors.

The questionnaire consisted of 22 items divided equally into two subscales (Table 1):

- the Academic Preparation (AP) dimension, representing the festina lente strategy related to completing academic preparation in advance, and
- the Non-required Enrichment (NE) dimension, representing the festina lente strategy related to voluntary effort and initiative beyond mandatory university requirements.

The first 11 statements measured students’ approaches within specific academic subjects (AP), whereas the remaining 11 assessed broader attitudes toward their university studies and professional development (NE).

Responses were recorded on a 7-point Likert scale ranging from (1) “completely untrue” to (7) “completely true.” Participants completed the questionnaire twice, as we were interested in the situation at the beginning and the end of the semester.

The instrument does not directly assess core metacognitive processes such as monitoring, evaluation, or strategic adjustment; rather, it captures self-reported learning behaviors theoretically aligned with principles of metacognitive self-regulation.

Table 1 Questionnaire for Measuring Learning-Related Behaviors Associated
 with The Festina Lente Principle in Higher Education

Academic Preparation behaviors (AP)	Non-required Enrichment behaviors (NE)
During a lecture, I often miss important points because my mind wanders to other things.®	If I take initiative during my university studies, I will be more successful in my professional life.
When reading a textbook as part of my course preparation, I create questions that help me focus better on the text.	If I experience difficulties entering professional life, it will be because I did not show enough initiative during my studies.
When I do not understand a concept while studying, I go back to it and try to comprehend it.	I try to take full advantage of opportunities to work beyond my academic duties in my field (e.g., volunteering).
If a text is difficult for me to understand, I try to come up with different ways to grasp its meaning.	If I find extracurricular work in my field (e.g., volunteering) demanding, I look for alternative ways to manage it.
Before I start studying a new topic, I briefly skim through the material to see what it is about and how it is organized.	When I plan activities beyond my academic duties (e.g., volunteering), I often find it difficult to follow through with my plans.
I try to adapt my study methods to the course objectives or to the teacher’s instructional style.	Before taking an initiative, I consider how it might help me in my professional career.

Academic Preparation behaviors (AP)	Non-required Enrichment behaviors (NE)
After reading a text, I often realize that I do not actually know what it was about.®	I try to adapt my extracurricular strategies according to the requirements of my future profession.
Instead of just reading a text automatically, I first reflect on the topic and think about what exactly I should learn.	I make sure that I am gradually and proactively preparing for my professional life.
When preparing for an exam or test, I try to identify the areas of the subject matter that I still do not fully understand.	I work regularly beyond my academic preparation in my field (e.g., volunteering).
I try to set my university goals in a way that also takes into account my other activities during the academic year.	I do not engage in extracurricular work in my field (e.g., volunteering) as much as I could because I prefer other activities. ®
If I take notes during a lecture that seems unclear to me, I later return to them and try to rewrite them in a more understandable form.	I try to work beyond my academic preparation in my field (e.g., volunteering) while also taking into account my other activities during the academic year.

Note. (®) = reverse-coded items.

Participants

Participants were recruited using a convenience sampling approach from among undergraduate students who were readily accessible to the researchers. The questionnaire was administered during the 2024/2025 academic year to 68 undergraduate students enrolled in science education programs at a Slovak university. The mean age of respondents was 20.6 years. The sample consisted of 48 female, 17 male participants, and 3 respondents who did not indicate their gender. Participation was voluntary and anonymous.

Procedure

Participants anonymously completed the questionnaire as part of a study assessing temporal changes between the beginning and end of the semester. They were informed about the purpose of the study and provided consent before participation.

Data Analysis

Data were analyzed using the Jamovi software (version 2.6.2). The normality of data distribution was examined using the Shapiro–Wilk test, which indicated a violation of the normality assumption ($p < 0.05$). Therefore, the non-parametric Wilcoxon signed-rank test was used to compare paired measurements. Associations between the Academic Preparation (AP) and Non-required Enrichment (NE) subscales and other continuous variables were examined using Spearman's rank correlation coefficient. For all analyses, statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

Changes in Festina Lente–Related Learning Behaviors

Descriptive statistics indicated an overall increase in students' engagement in learning-related behaviors associated with the festina lente principle across the semester. Mean, median, and mode values increased for both the Academic Preparation (AP) and Non-required Enrichment (NE) dimensions (Table 2).

Table 2 Descriptive Characteristics of The Research Sample and
 Correlation Matrix of The Questionnaire Variables

		APpre	NEpre	APpost	NEpost
Mean		4,516	3,948	4,694	4,072
Median		4,500	3,909	4,636	4,227
Mode		4,273 ^a	3,909	4,455	3,909 ^a
Standard deviation		0,762	0,736	0,829	0,796
IQR		1,182	0,841	1,091	1,091
NEpre	Spearman's rho	0,313**			
	p-value	0,009			
APpost	Spearman's rho	0,784***	0,313**		
	p-value	<,001	0,009		
NEpost	Spearman's rho	0,411***	0,810***	0,410***	
	p-value	<,001	<,001	<,001	
Age	Spearman's rho	-0,226	0,033	-0,171	0,034
	p-value	0,063	0,789	0,164	0,784

Notes: AP_pre – Festina lente–related learning behaviors: Academic Preparation: at the beginning of the semester. AP_post – Festina lente strategy related to academic preparation at the end of the semester. NE_pre – Festina lente strategy related to work and study beyond university requirements at the beginning of the semester. NE_post – Festina lente strategy related to work and study beyond university requirements at the end of the semester.

A Wilcoxon signed-rank test confirmed a statistically significant improvement between the beginning and the end of the semester in both dimensions. Specifically, the difference between AP_pre and AP_post was significant ($W = 546.000$, $p = 0.003$) with a small effect size ($d = 0.31$). Similarly, a significant difference was observed between NE_pre and NE_post ($W = 552.500$, $p = 0.030$; $d = 0.29$). According to Cohen's conventions, both effect sizes were small, indicating modest practical significance. (Table 2). Correlation analysis revealed strong positive associations between all four measured variables (AP_pre, NE_pre, AP_post, NE_post). In contrast, no significant correlations were found with age (Table 3).

Table 3 Changes in Festina Lente–Related Learning Behaviors

			Statistic	P	Mean difference	SE difference		Effect Size
APpre	APpost	Wilcoxon W	546,000*	0,003	-0,182	0,070	Cohen's d	0,309
NEpre	NEpost	Wilcoxon W	552,500*	0,030	-0,136	0,052	Cohen's d	0,290

Gender Differences

To examine gender-related patterns, mean scores of the AP and NE dimensions were compared between male and female students using the Mann–Whitney U test, due to non-normal data distribution (Shapiro–Wilk, $p < .05$). The results showed a significant gender difference in the AP dimension ($U = 191.5$, $p = 0.017$), with female students ($M = 4.77$, $SD = 0.71$) demonstrating higher levels of engagement in learning-related behaviors associated with the festina lente principle in academic contexts than male students ($M = 4.25$, $SD = 0.68$).

No significant difference was found between genders in the NE dimension ($U = 371.5$, $p = 0.382$), indicating that both groups engaged similarly in voluntary activities beyond formal study requirements (Figure 1).

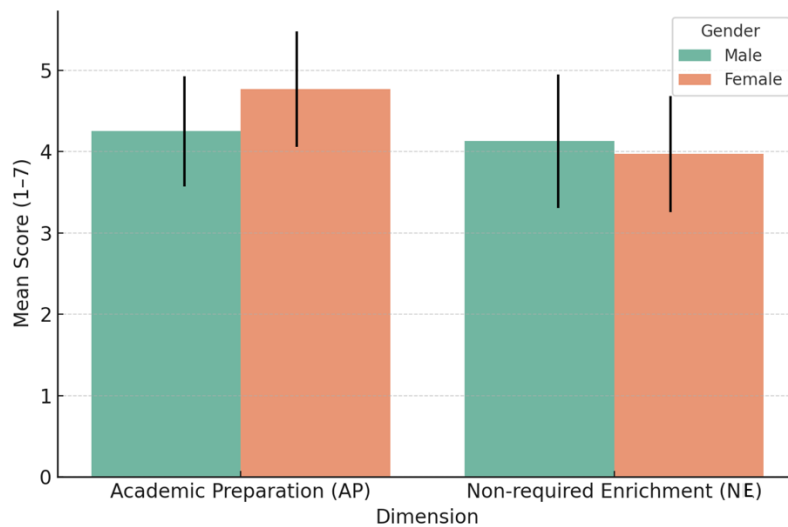


Figure 1 Gender Differences in Festina Lente–Related Learning Behaviors

Interpretation of Results in Relation to Hypotheses

Before interpreting the hypotheses, it is important to note that the present findings do not provide evidence of strategy adoption or metacognitive development in a causal sense. Rather, the results document temporal patterns in behaviors conceptually aligned with metacognitive self-regulation within the festina lente framework. The hypothesized temporal changes should be understood as exposure-based expectations grounded in self-regulated learning theory rather than as predictions of strategy acquisition driven by a specific instructional intervention. The results were consistent with the first two hypotheses, indicating statistically significant temporal changes in behaviors associated with both the Academic Preparation (AP) and Non-required Enrichment (NE) dimensions. The findings were also consistent with the third hypothesis, as female students demonstrated higher engagement in AP-related behaviors, while no gender differences were observed in NE-related behaviors.

The results indicate that students devote more attention to their academic preparation both at the beginning and the end of the semester than to activities beyond these formal requirements. This finding can be explained by the fact that responsibility for learning develops gradually along with self-actualization needs, for example, with the transition to employment (Škoda & Douřák, 2011). The comparison further revealed statistically significant differences between the pre- and post-semester measurements for both the Academic Preparation (AP) and Non-required Enrichment (NE) dimensions, although the effect sizes were small. This pattern is consistent with the view that stable learning-related behaviors, once established through experience and feedback, may generalize across contexts without necessarily reflecting deliberate strategy adoption (Škoda & Douřák, 2011).

In addition to the observed pre-post differences, the correlation analysis provides further insight into the internal coherence of the festina lente–related behavior pattern. Strong positive correlations were found between academic preparation and non-required enrichment at both measurement points, suggesting that these dimensions do not represent isolated behaviors but rather interconnected aspects of a broader self-regulatory learning orientation.

The strong associations between pre- and post-semester measures further indicate temporal stability in individual differences, while still allowing for gradual developmental change across the semester. These findings are compatible with interpreting festina lente as a coherent behavioral self-regulation pattern aligned with metacognitive principles rather than as a set of unrelated study behaviors.

The significant increase in NE scores from the beginning to the end of the semester suggests that students increasingly connect theory with practice during their studies. However, the small effect size indicates that this integration may occur in an automatic rather than deliberate manner, similar to other learning strategies (Škoda & Doulík, 2011). Importantly, this automaticity should not be interpreted as evidence of deliberate strategy development or metacognitive growth. Rather, it likely reflects the stabilization of learning-related behaviors shaped by repeated academic demands and feedback within the given instructional context.

The apparent automatic application of festina lente-related behaviors may instead reflect students' repeated exposure to feedback and academic routines that favor regular engagement with learning materials, such as working with smaller and more distributed amounts of information (Turek, 2014).

The development of metacognitive regulation requires systematic practice and explicit instructional support, as demonstrated by empirical intervention studies showing improvements in planning, monitoring, and strategy use even within relatively short instructional periods (Dignath & Büttner, 2008; Zohar & Barzilai, 2013). These findings align with the view that metacognitive development unfolds gradually and often implicitly, particularly when effect sizes are modest (Turek, 2014). This interpretation is further supported by the observation that the importance of metacognitive development is frequently underestimated in educational practice (Škoda & Doulík, 2011).

The differentiation of learning approaches was originally described by Marton and Säljö (1976a), who observed students' behavior when working with academic texts. They identified two main orientations: a surface approach, characterized by rote memorization without deeper understanding, and a deep approach, emphasizing comprehension, meaning, and the active integration of new knowledge with prior understanding (Marton & Säljö, 1976a). When students perceive a task as something to "understand," they adopt a deep approach, whereas when they perceive it as something to "pass," they rely on surface learning strategies (Marton & Säljö, 1976b).

Items in the AP subscale of our questionnaire correspond more closely to these theoretical learning approaches than the NE items, as AP focuses exclusively on fulfilling academic preparation, such as reading mandatory materials with comprehension. Based on Marton and Säljö's (1976a, b) conceptualization, the festina lente strategy in the academic context may represent different levels of applying the deep learning approach. At the same time, it is plausible that students who prefer deep learning are also more likely to engage in NE-type activities, as their motivation to "understand" naturally extends toward exploring knowledge beyond formal requirements (Marton & Säljö, 1976b).

To validate these assumptions, further studies are needed. Nevertheless, the present findings are consistent with previous research demonstrating that even short-term changes in the learning environment can lead to small but statistically significant increases in deep learning approaches within a single semester (Hall et al., 2004). The observed increase in

mean, median, and mode values for AP from pre- to post-semester is consistent with a pattern of deliberate pacing and reflective engagement, as represented by the festina lente principle, and may reflect gradual changes in learning-related self-regulation behaviors over time.

Implications for Practice and Recommendations

Previous research suggests that teachers can influence students' approaches to learning by modifying the learning environment (Hall et al., 2004). As a result, an active and reflective attitude towards academic responsibilities cannot be seen only as the responsibility of individual students, but also as the responsibility of educational institutions that shape the conditions for learning. Future research on festina lente could therefore focus on questions such as: Does the institution sufficiently support the development of festina lente in students? In what ways does it do so? How could this support be strengthened or made more effective?

Since this research represents a pilot study, the current version of the questionnaire does not yet include items addressing institutional influences. However, the instrument developed for this study may have practical applications in higher education.

The results of the study could serve as a stimulus for reflective discussions between teachers and students, thereby promoting metacognitive awareness, one of the key determinants of effective learning (Turek, 2014). When these expectations are communicated directly to students, they may subsequently adopt positive beliefs about their own learning potential, a phenomenon known as the Galatea effect (Eden, 1992). Such reflective discussions could also guide students in formulating SMART goals, as specific, measurable, ambitious, realistic and time-bound goals. Setting SMART goals has been shown to reinforce self-fulfilling prophecies, such as the Pygmalion and Galatea effects (Howard et al., 2015), thereby creating a positive cycle between expectation, motivation and achievement.

To operationalize the festina lente principle in educational practice, instructors may intentionally design learning activities that support both dimensions of the strategy.

For the Academic Preparation (AP) dimension, one concrete approach is the use of structured preparatory tasks submitted well in advance of deadlines, such as short pre-class reflective prompts or concept-mapping assignments. These activities require students to engage with course content early, identify areas of uncertainty, and plan their learning process proactively, thereby fostering deliberate pacing and metacognitive monitoring rather than last-minute performance-oriented studying.

For the Non-required Enrichment (NE) dimension, institutions may support voluntary, low-stakes engagement beyond formal coursework, for example through optional field-related projects, reflective portfolios documenting extracurricular learning experiences, or credit-recognized volunteering linked to students' future professional roles. Such curriculum elements encourage students to connect theoretical knowledge with practice while allowing them to regulate their level of engagement according to personal goals and capacities, consistent with the festina lente principle of gradual and sustainable development.

Limitations of the Study

The research was conducted on a relatively small sample, which limits the generalizability and robustness of the findings. Moreover, personality and demographic factors that might influence engagement in learning-related behaviors associated with the festina

lente principle were not analyzed. Future research should therefore include larger and more diverse samples and consider individual differences such as prior academic achievement, motivational orientation, metacognitive skills, and self-regulation capacity. In addition, future studies should examine contextual moderators related to specific courses and instructional environments, which may influence learning-related behaviors associated with the festina lente principle. Such factors could help explain variability in effect sizes and clarify whether behaviors associated with festina lente reflect primarily automatic engagement patterns or more consciously regulated learning practices. Investigating these moderators may contribute to a more nuanced understanding of how deliberate pacing strategies develop in higher education contexts. Given the exploratory nature of the study and the lack of experimental manipulation, the observed temporal changes cannot be interpreted as evidence of strategy acquisition or metacognitive development. Rather, they indicate behavioral patterns that may be influenced by contextual and instructional factors. Further longitudinal and intervention-based research is needed to clarify these mechanisms. The unequal gender distribution in the sample further limits the generalizability of findings related to gender differences and should be considered when interpreting results associated with hypothesis H3. As the study relies on self-report data, responses may be influenced by social desirability bias and subjective self-perception. Such data capture perceived learning behaviors rather than objectively observed or experimentally verified regulatory processes, which should be considered when interpreting the findings.

CONCLUSIONS

The findings indicate that college students engage in learning-related behaviors associated with the festina lente principle during independent learning. However, the resulting pattern suggests that this engagement is likely to occur in an automatic rather than a deliberate manner, highlighting the need for further research. The results also suggest that learning-related behaviors associated with the festina lente principle are conceptually aligned with metacognitive regulation, which concerns how learners monitor, plan, and adjust their learning over time. Given that this study represents an initial pilot study, further research is needed to confirm these interpretations. The insights gained from this monitoring could help educators improve students' metacognitive awareness and promote more sustainable and self-regulated approaches to learning.

ACKNOWLEDGEMENTS

Special thanks are extended to PhDr. ThLic. Peter Ikhardt, PhD., and Mgr. Gabriela Pleschová, MSc., PhD., for their valuable advice and recommendations, which significantly contributed to the development of this study.

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