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ANALYSIS OF FACTORS HINDERING LOGISTICS LEARNING DURING CLASSES: A THEORETICAL-EMPIRICAL STUDY

ANÁLISE DOS FATORES QUE IMPEDEM O APRENDIZADO DE LOGÍSTICA DURANTE AS AULAS: UM ESTUDO TEÓRICO-EMPÍRICO

ANÁLISIS DE LOS FACTORES QUE IMPIDEN EL APRENDIZAJE DE LOGÍSTICA DURANTE LAS CLASES: UN ESTUDIO TEÓRICO-EMPÍRICO

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ABSTRACT
This study aimed to analyze the factors hindering learning among students in the Higher Education Technology Program in Logistics during classes, addressing three guiding questions: which factors impede learning, how these factors interfere with the process, and why they produce such effects. This qualitative, exploratory, descriptive study involved students in a class in the Logistics Technology Program at the Federal Institute of Education, Science and Technology of Amazonas (IFAM), Manaus Industrial District Campus. Data were collected through an online semi-structured instrument and analyzed using a similarity technique, followed by grouping responses into analytical categories. The results revealed five dimensions of factors interfering with learning: pedagogical,

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technological, individual, behavioral/social, and structural-organizational. Pedagogical factors stood out, mainly related to a lack of practical application, an excess of theoretical classes, poor teaching methods, a lack of focus/conciseness, and issues with teaching approaches and instructor performance. The analysis showed that these factors primarily interfere with attention, concentration, focus, comprehension, interest, content retention, and the integration of theory and practice. Students cited attention deficits, comprehension difficulties, monotony, excessive complexity, lack of focus, absence of practical contextualization, insufficient resources, and low engagement. The study concludes that learning difficulties are a multidimensional, process-oriented phenomenon in which various factors can combine to compromise the conditions necessary for learning. The results suggest, therefore, that understanding learning in Logistics requires an integrated approach covering pedagogical, individual, technological, behavioral, social, and structural dimensions.

Keywords: Learning; Logistics education; Learning factors; Higher education; Pedagogical practices.

RESUMO

Este estudo teve como objetivo analisar os fatores que impedem o aprendizado de estudantes do Curso Superior de Tecnologia em Logística durante as aulas, considerando três questões norteadoras: quais fatores impedem o aprendizado, como esses fatores interferem nesse processo e por que produzem tais efeitos. Trata-se de uma pesquisa qualitativa, exploratória e descritiva, realizada com estudantes de uma turma do Curso de Tecnologia em Logística do Instituto Federal de Educação, Ciência e Tecnologia do Amazonas (IFAM), Campus Manaus Distrito Industrial. Os dados foram coletados por meio de um instrumento semiestruturado aplicado on-line e analisados por meio de uma técnica de similaridade, com posterior agrupamento das respostas em categorias analíticas. Os resultados evidenciaram cinco dimensões de fatores que interferem na aprendizagem: pedagógica, tecnológica, individual, comportamental e social e estrutural-organizacional. Entre elas, destacaram-se os fatores pedagógicos, relacionados principalmente à falta de prática, ao excesso de aulas teóricas, à falta de didática, à pouca objetividade e a questões associadas ao método e à atuação docente. A análise dos efeitos mostrou que esses fatores interferem principalmente na atenção, concentração, foco, compreensão, interesse, fixação dos conteúdos e na articulação entre teoria e prática. As razões atribuídas pelos estudantes incluíram déficit de atenção, dificuldade de compreensão, monotonia, excesso de complexidade, pouca objetividade, ausência de contextualização prática, insuficiência de recursos e baixo envolvimento. Conclui-se que as dificuldades de aprendizagem constituem um fenômeno multidimensional e processual, no qual diferentes fatores podem se combinar e comprometer, sucessivamente, as condições necessárias à aprendizagem. Os resultados sugerem, portanto, que a compreensão da aprendizagem em

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Logística requer uma abordagem integrada das dimensões pedagógica, individual, tecnológica, comportamental, social e estrutural.

Palavras-chave: Aprendizagem; Ensino de Logística; Fatores de aprendizagem; Ensino superior; Práticas pedagógicas.

RESUMEN

Este estudio tuvo como objetivo analizar los factores que obstaculizan el aprendizaje de los estudiantes del Curso Superior de Tecnología en Logística durante las clases, considerando tres preguntas orientadoras: qué factores impiden el aprendizaje, cómo interfieren dichos factores en el proceso y por qué producen tales efectos. Se trata de una investigación cualitativa, exploratoria y descriptiva, realizada con estudiantes de un grupo del Curso de Tecnología en Logística del Instituto Federal de Educación, Ciencia y Tecnología de Amazonas (IFAM), Campus Manaus Distrito Industrial. Los datos se recopilaron mediante un instrumento semiestructurado aplicado en línea y se analizaron mediante una técnica de similitud, seguida de la agrupación de las respuestas en categorías analíticas. Los resultados evidenciaron cinco dimensiones de factores que interfieren en el aprendizaje: pedagógica, tecnológica, individual, conductual, socioestructural-organizativa. Entre ellas, destacaron los factores pedagógicos, relacionados principalmente con la falta de práctica, el exceso de clases teóricas, la falta de didáctica, la escasa objetividad y cuestiones asociadas al método y a la actuación docente. El análisis de los efectos mostró que estos factores interfieren principalmente en la atención, la concentración, el enfoque, la comprensión, el interés, la fijación de contenidos y la articulación entre la teoría y la práctica. Las razones atribuidas por los estudiantes incluyeron déficit de atención, dificultad de comprensión, monotonía, exceso de complejidad, falta de objetividad, ausencia de contextualización práctica, insuficiencia de recursos y bajo nivel de implicación. Se concluye que las dificultades de aprendizaje constituyen un fenómeno multidimensional y procesual, en el que diferentes factores pueden combinarse y comprometer, de forma sucesiva, las condiciones necesarias para el aprendizaje. Por tanto, los resultados sugieren que la comprensión del aprendizaje en logística requiere un enfoque integrado de las dimensiones pedagógicas, individuales, tecnológicas, conductuales, sociales y estructurales.

Palabras clave: Aprendizaje; Enseñanza de Logística; Factores de aprendizaje; Educación superior; Prácticas pedagógicas.

1 INTRODUCTION

Learning in higher education has been extensively investigated in recent decades (Mayombe, 2025; Bauer et al., 2025; Wang et al., 2026), particularly in light of challenges posed by diverse student profiles (Martínez-Corcuera, 2026; Bolina et al., 2026), the intensified use of digital technologies (Kumi-Yeboah et al.,

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2025; Kabaçali et al., 2025), and transformations in teaching methodologies (Wang; Jiang, 2025; Li, 2024). In technology-focused degree programs—such as the Logistics Technology program—these challenges become even more pronounced, as the curriculum requires not only theoretical mastery but also practical skills applicable to the labor market. Against this backdrop, understanding the factors that hinder the student learning process, especially during the early stages of the program, is crucial for developing pedagogical strategies that are more effective and aligned with students' needs.

Recent studies indicate that learning difficulties cannot be attributed to a single factor but rather to a set of interrelated variables involving individual, pedagogical, social, technological, and structural aspects (Maican et al., 2025; Reho et al., 2024; Christodoulou et al., 2024; Li et al., 2024). Key factors among these include demotivation, lack of attention, non-interactive teaching methods, highly distracting classroom environments, inappropriate use of technology, and limitations in educational infrastructure. Furthermore, first-semester students often face additional challenges related to adapting to higher education, managing their time, and balancing studies, work, and personal life; these factors can exacerbate learning difficulties and negatively affect academic performance.

Given this context, it has become essential to systematically investigate the factors that interfere with learning to inform institutional and pedagogical initiatives to improve the quality of education. Identifying these factors not only helps explain the difficulties students face but also guides interventions that foster greater engagement, participation, and academic success. Moreover, this analysis helps strengthen more inclusive and effective educational practices, aligning with the contemporary demands of higher education. Thus, this article aimed to analyze the factors hindering learning among first-semester students in the Logistics Technology program during classes, employing a multidimensional approach that considers individual, pedagogical, behavioral, social, technological, and structural aspects. By proposing this analysis, the study seeks to advance knowledge in education and provide practical insights for improving the teaching-learning process in technology-focused degree programs.

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2 LITERATURE REVIEW

The literature review revealed that the factors affecting student learning are multidimensional and interdependent, and can be organized into distinct analytical dimensions. Studies indicate that variables related to the student, the teacher, the social environment, technology, and institutional structure interact to determine educational outcomes. Research by Morales (2024) shows that learning difficulties arise from the interplay of personal, pedagogical, and social factors, underscoring the need for systemic analytical approaches. Ramos et al. (2025) examined the post-pandemic period and found that cognitive, emotional, and social dimensions are now considered together when analyzing learning, broadening understanding of the educational phenomenon. These studies emphasize that the learning process is influenced by elements such as motivation, environment, teaching methods, and technological resources, characterizing it as a multifactorial system. Furthermore, research on educational technologies shows that technological factors complement other variables and can either enhance or hinder academic performance (Duarte et al., 2024). Recent evidence indicates that social influence and organizational context also play a significant role in learning, particularly in technology-mediated environments (Bett & Tezza, 2025). Thus, the literature classifies factors that hinder classroom learning into five main dimensions: individual, pedagogical, behavioral and social, technological, and structural-organizational.

The individual dimension pertains to the student's internal processes and involves cognitive, metacognitive, motivational, and emotional components that regulate engagement in academic activities. Studies show that self-regulation capacity strongly shapes learning; it is defined as the set of strategies students use to plan, monitor, and evaluate their performance. Hartelt and Martens (2024) explain that students with greater self-regulation mastery achieve better academic results because they can manage their attention, effort, and cognitive strategies more efficiently. Factors such as fatigue, lack of interest, and lack of focus are directly associated with reduced cognitive load available for information

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processing, which hinders meaningful learning. Research by Bruin et al. (2025) indicates that motivation and self-efficacy play a central role in a student's willingness to invest mental effort and determine educational success. The individual dimension should be understood as a dynamic system in which psychological and cognitive aspects continuously interact, influencing the student's ability to maintain attention and persist in learning tasks.

Distraction and multitasking—especially when mediated by digital technologies—intensify challenges within the individual dimension, directly affecting students' levels of attention and self-regulation. Classroom distraction is associated with reduced cognitive control and the inadequate use of learning strategies, thereby compromising academic performance (Deng et al., 2024). Self-regulated learning is a cyclical process that integrates cognitive, emotional, and behavioral factors and is essential for developing competencies such as critical thinking, autonomy, and problem-solving (Šašić & Atlaga, 2024). Research such as that by Li (2024) indicates that students with low self-regulation capacity are more prone to disengagement and procrastination, underscoring the importance of educational interventions aimed at developing these skills. The individual dimension constitutes a central axis for understanding learning difficulties, as it encompasses internal variables that directly shape how the student interacts with the educational process.

The pedagogical dimension (encompassing both instruction and teaching practice) comprises elements related to the teacher's role, teaching strategies, and the didactic organization of content, serving as a key determinant of learning quality. Teaching effectiveness is directly linked to the teacher's ability to foster active student engagement through interactive, student-centered methodologies—such as the flipped classroom model. This model significantly impacts the development of learning capabilities by boosting student engagement, demonstrating that well-structured pedagogical strategies enhance academic performance (Pan & He, 2024). Innovative pedagogical practices, such as those described by Tan-Abrenica et al. (2024), show that approaches like project-based learning and gamification foster greater student participation and motivation,

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thereby mitigating disinterest and passivity. Another relevant aspect is adopting active and adaptive methodologies, which allow instruction to be tailored to individual student needs and promote deeper, more meaningful learning (Shi & Liu, 2025). The pedagogical dimension highlights that overly theoretical lessons, a lack of practical application, and a lack of didactic clarity directly compromise the teaching-learning process by limiting interaction and the active construction of knowledge.

The literature also indicates that the quality of teaching practice depends not only on the methodologies employed but also on the continuous development of the teacher's pedagogical competencies and their ability to adapt to diverse educational contexts. Collaborative programs, such as "lesson study," significantly enhance teaching competencies and positively affect didactic organization, inclusion, and teaching effectiveness (Basister et al., 2025). The teaching strategies instructors adopt directly influence the depth of student learning, with pedagogical interaction serving as an essential mediator (Xu et al., 2025). Research such as Xinfa et al. (2025) highlights that well-structured, innovative, and hybrid teaching models enhance both teaching quality and student satisfaction, though they require continuous pedagogical and institutional improvement. Student-centered teaching, supported by technologies and interactive methodologies, represents an established trend in contemporary education (Sway, 2025). The pedagogical dimension serves as a structural axis of learning, encompassing variables related to didactics, methodology, and teaching competence that directly influence educational outcomes.

The behavioral and social dimension of the classroom environment concerns student interactions, the collective atmosphere, and behavioral patterns that emerge during pedagogical activities, all of which directly influence the learning process. Noise from side conversations and student activities is a major source of cognitive interference, hindering comprehension of the teacher's speech and reducing concentration. Fretes and Palau (2025) showed that classroom noise negatively affects cognitive functions—such as attention, memory, and comprehension—and therefore affects students' academic performance. Visentin

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and Prodi (2025) indicated that noise from student activity is the primary component of the classroom acoustic environment and can reach levels that impede speech perception and compromise student well-being. Other studies have also shown that poor acoustic quality significantly reduces listening and learning capabilities, particularly in contexts with multiple simultaneous sources of speech (Vettori et al., 2024). Factors such as side conversations, interruptions, and lack of discipline are not merely behavioral issues but also structural elements of the environment that directly affect the cognitive processes involved in learning.

Literature shows that peer behavior strongly influences individual performance, framing the classroom as a dynamic social system where students learn not only from the teacher but also from one another. Peers who exhibit disruptive behavior can negatively affect academic outcomes and even shape future educational trajectories, highlighting the "behavioral contagion" effect within the school environment. Disruptive behaviors are often linked to external factors—such as family context and socioeconomic conditions—reinforcing the ecological nature of the educational setting (Ashraf et al., 2024). Mealings and Buchholz (2025) found that classroom organization—including behavior management and activity structure—is crucial for fostering well-being, attention, and learning, particularly in contexts of heightened vulnerability. The behavioral and social dimension underscores that the classroom environment must be understood as an interactive ecosystem in which norms, interpersonal relationships, and collective behavioral patterns directly influence the quality of the educational process.

The technological dimension encompasses factors related to the use, access, and integration of digital technologies in the teaching-learning process, playing an ambivalent role as both a facilitator and a potential source of distraction. Digital devices—especially smartphones and laptops—are currently a primary cause of classroom distraction, fostering "distractive multitasking" that compromises attention and content retention (Deng et al., 2024). Martin et al. (2025) showed that digital distraction leads to significant losses in academic performance, linked to fragmented attention, ineffective reading, and reduced comprehension. Inappropriate use of mobile devices in the classroom is a global

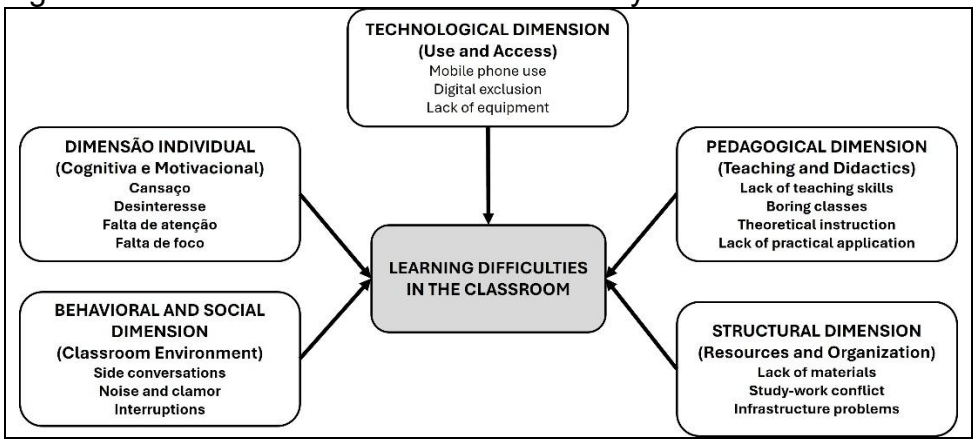
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phenomenon influenced by motivational and contextual factors, reducing student engagement (Flanigan et al., 2025). These findings indicate that mobile phones, electronic devices, and technology—when not properly mediated—become critical factors that negatively interfere with learning. The technological dimension highlights that mere access to technology does not guarantee educational improvement; effective pedagogical management is required to avoid adverse effects (Figure 1).

Figure 1. Theoretical architecture of the study.



Source: Prepared by the authors.

Digital technologies possess transformative potential when integrated pedagogically and strategically into the educational process. Fahrni et al. (2025) indicate that technology-mediated learning environments can foster self-regulation, metacognition, and student autonomy, especially when combined with appropriate instructional strategies. Alam et al. (2025) also noted that educational technologies—such as interactive response systems, adaptive platforms, and artificial intelligence-based tools—significantly increase engagement and personalize learning. Integrating technology with self-regulation strategies supports monitoring one's learning and improves academic performance, particularly in complex digital environments (Sohail et al., 2025). These benefits depend directly on equitable access to technology; the digital divide is a critical factor that exacerbates educational inequalities. Consequently, the technological

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dimension must be understood as a dual system where opportunities and risks coexist, requiring a balance between access, pedagogical use, and the regulation of digital behavior to maximize learning outcomes.

The structural and organizational dimension encompasses the physical, material, and institutional conditions that underpin the educational process, including school infrastructure, the availability of teaching resources, and the organization of time and academic activities. The quality of the physical learning environment significantly influences student performance, particularly in contexts where basic resources are scarce. Factors such as access to teaching materials, facility quality, and equipment availability are essential components of the so-called educational production function and directly affect learning outcomes (Andrade et al., 2024). Andrade et al. (2024) found that inadequate infrastructure—such as overcrowded classrooms, insufficient furniture, and a shortage of pedagogical resources—is associated with lower engagement and higher dropout rates. Open educational resources have been identified as an effective strategy to expand access to materials and reduce inequalities, thereby improving performance and course completion rates. This implies that investments in educational infrastructure, including improvements to physical spaces and support resources, can boost academic performance, provided they are integrated with effective pedagogical practices. The structural dimension demonstrates that learning depends not only on individual or pedagogical factors but also on the concrete conditions that enable teaching to take place.

The literature also highlights that organizational factors—such as time management, balancing study and work, and institutional organization—play a decisive role in student retention and performance. Okoye et al. (2024) point out that the organizational structure of educational institutions, including curriculum planning, the distribution of course hours, and access to resources, directly influences the academic experience and educational outcomes. Arjanto and Telussa (2024) demonstrated that improving school facilities and resources (while important) is not sufficient on its own to guarantee better outcomes; the interaction with pedagogical and socioeconomic factors must also be considered. Other

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research highlights that educational continuity can be severely compromised by structural flaws, such as a lack of planning and infrastructure vulnerability to external events, which impact students' academic trajectories (Opabola; Galasso, 2024). The structural and organizational dimension should be understood as an integrated system that includes not only physical resources but also how those resources are managed and made available. This implies that factors such as a lack of materials, inadequate resources, and conflicts between study and work pose significant barriers to learning, reinforcing the need for educational policies that promote equity, accessibility, and organizational efficiency within the school environment.

3 RESEARCH METHODOLOGY

This research is a qualitative, exploratory, and descriptive study aimed at understanding, based on students' perceptions, the factors that hinder learning in logistics classes. The investigation was structured around three guiding questions: 1) what factors hinder learning during classes, 2) how these factors hinder it, and 3) why these factors hinder it. These questions guided data collection, organization, analysis, and interpretation, enabling a progression from identifying the factors to understanding their effects and the reasons students attributed to those effects.

The research design was developed in successive stages: defining the general objective and guiding questions; selecting participants; contacting respondents; administering the data collection instrument; transcribing and organizing responses; conducting a similarity analysis; identifying convergences and differences; generating results; and interpreting findings by comparing empirical data with the theoretical framework. This procedure organized student responses into three analytical levels corresponding to the research questions: what hinders learning, how it hinders learning, and why it hinders learning.

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3.1 Context, population, and participants

The research was conducted at the Federal Institute of Education, Science and Technology of Amazonas (IFAM), specifically at the Manaus Industrial District Campus, involving students from the Higher Education Technology Program in Logistics. Participants were in a Scientific Writing class, which provided the context for investigating student perceptions of factors that interfere with learning during classes.

The study involved all 17 student participants, as noted in the description of data collection and research limitations. All participants completed the instrument online via the course messaging group. Demographic data indicated a predominance of students aged 21 to 30 and a majority of male participants; regarding employment status, 64.71% reported being employed, and 35.29% had no employment ties.

3.2 Data collection instrument

Data collection used a semi-structured online instrument designed to address the research's guiding questions (Nascimento-e-Silva, 2020; 2021a; 2023). The instrument was organized into three main sections. The first asked students to identify factors that hindered learning during classes; the second asked how these factors interfered with learning; and the third asked why these factors produced such effects. In addition, the study collected demographic information on participants' age, gender, and professional status.

For each of the three central questions, students indicated two factors or responses they considered relevant to explaining the phenomenon under investigation. The instrument was developed based on the research's theoretical framework, then cross-referenced with that framework and evaluated by other researchers, as described in the study (Nascimento-e-Silva, 2023; 2021b). This structure allowed for the collection of open-ended responses, which were later grouped based on thematic and semantic proximity.

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3.3 Data collection procedures

The instrument was made available to students via an online form, and the link was sent to the course messaging group. Follow-up requests were sent to encourage form completion because responses were delayed. Once data collection concluded, all responses were compiled and organized for subsequent analysis.

The responses were transcribed and organized to preserve the content participants originally provided. For each question, responses were presented in tables to identify similarities, differences, and recurring themes. This procedure aimed to maintain the fidelity of the students' statements and provide an organized basis for analysis (Nascimento-e-Silva, 2023; 2021c).

3.4 Data organization and analysis procedures

Data analysis used a similarity technique to identify significant similarities and differences among participants' statements (Nascimento-e-Silva, 2026). Initially, the researchers examined responses to each question individually and grouped them by the proximity of meaning. When different participants provided similar responses, these were grouped into a single analytical category; when they presented distinct content, the differences were preserved to reflect the breadth of the phenomenon under investigation.

For the first question (what factors hinder learning during classes?), responses were subsequently organized into the five analytical dimensions defined in the theoretical framework: individual; pedagogical; behavioral and social; technological; and structural-organizational. This classification allowed us to identify the concentration of occurrences within each dimension and led to the organization presented in Table 1.

For the second question (how do the factors hinder learning?), the analysis sought to identify each factor's effect on the learning process. Responses were grouped into categories related to distraction and loss of concentration, loss of focus, difficulty in comprehension, reduced interest, difficulty in retaining content,

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and difficulty in connecting theory and practice, resulting in the analytical structure shown in Table 2.

For the third question (why do these factors hinder learning?), the reasons or explanatory mechanisms cited by the students themselves were identified. Responses were grouped into categories such as: attention deficits and loss of focus; difficulty in comprehension; monotony and lack of engagement; excessive complexity and lack of conciseness; absence of practical contextualization; insufficient resources and equipment; low engagement or motivation; factors external to the pedagogical process; and difficulty following the lesson. This stage resulted in the organization presented in Table 3.

3.5 Strategy for interpreting the results

The interpretation of the results compared empirical findings with the theoretical framework adopted for the research. The procedure sought to address not only what was found but also how specific factors interfere with learning and why they produce such effects. Thus, the interpretation linked the students' data to the five analytical dimensions established in the literature review.

This strategy enabled an interpretive sequence connecting the three guiding questions. First, the sources of learning difficulties were identified; next, the effects of these sources on the learning process were examined; finally, the reasons or mechanisms explaining these effects were identified. Based on this procedure, the results were interpreted according to a logic that can be summarized as follows: interfering factor → impairment of attention, interest, or comprehension → difficulty with assimilation, retention, or the integration of theory and practice → hindrance to learning.

3.6 Summary of the methodological process

The methodological process adopted can be summarized in ten interrelated stages: 1) definition of the general objective; 2) formulation of guiding questions; 3) selection of participants; 4) contact with participants; 5) administration of the instrument; 6) organization/transcription of responses; 7) systematization of data;

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8) analysis based on similarity; 9) generation of results; and 10) interpretation of results through comparison with the theoretical framework. This process transformed individual student responses into analytical categories that represent the various dimensions of the phenomenon under investigation.

3.7 Methodological limitations

The main limitations of the research are the small number of participants and the fact that the study was conducted within a single class and institution, which restricts the generalizability of the results to other educational contexts. Furthermore, the study relied primarily on a single source of evidence (student responses) and did not incorporate, for example, systematic classroom observations or teacher accounts. The authors acknowledge that using other sources could broaden understanding of the phenomenon and allow for triangulation of evidence.

4 RESULTS AND DISCUSSION

This research presents and discusses results based on an analysis of responses from all 17 students enrolled in the Higher Education Technology Program in Logistics—specifically in the "Introduction to Scientific Research" course—to understand learning difficulties during classes from a multidimensional perspective. The findings are organized around the study's three guiding questions, making it possible to identify, first, which factors hinder learning; next, how these factors interfere with the learning process; and finally, why they produce these effects. Student feedback was grouped by similarity and linked to the five analytical dimensions established in the theoretical framework (individual, pedagogical, behavioral/social, technological, and structural-organizational). This approach highlighted not only the frequency of these factors but also the relationships among their causes, effects, and the mechanisms through which they compromise learning. Thus, the results go beyond identifying obstacles, showing how various interfering factors can progressively compromise attention,

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interest, comprehension, assimilation, retention, and the connection between theory and practice.

4.1 Factors that hinder learning

The most significant finding is that pedagogical barriers emerge as the primary factor, accounting for 10 (30.3%) instances. Students specifically cite the absence of practical activities, overly theoretical lessons, a lack of effective teaching methods and clarity, and issues regarding teaching approaches and instructor performance. Technological factors rank second, with 8 instances (24.2%); however, these should not be interpreted simply as a "lack of technology." Table 1 reveals a more complex scenario, showing a combination of issues: inappropriate use of technology, use of mobile phones and electronic devices, technological exclusion, and a lack of access to computers. Individual factors accounted for 7 instances (21.2%)—the third-largest group—and included fatigue, lack of interest, and lack of attention or focus. Behavioral and social factors accounted for 6 instances (18.2%) and primarily involved talking, noise, side conversations, and interruptions during class. Structural and organizational factors appeared in 2 instances (6.1%), the least frequent category; these were associated with a lack of materials and difficulty balancing study time with work.

Table 1. Factors hindering learning during classes.

Synthesis factor	Main manifestations observed	Dimension	Incidents
Problems in pedagogical practice	Lack of practical classes or hands-on experience; theoretical classes; lack of pedagogical skills, clear methodology, and focus; teaching performance issues	Pedagogical	10
Inadequate or insufficient use of technology	Mobile phones, electronic devices, inappropriate use of technology, the digital divide, lack of computers and audiovisual resources	Technological	8
Low student engagement	Fatigue, lack of interest, inattention, and lack of focus	Individual	7
Interference from the classroom environment	Conversations, noise, side conversations, and interruptions	Behavioral / social	6
Structural and organizational limitations	Falta de materiais e dificuldade de conciliar estudo e trabalho	Structural / organizational	2

Source: Research data collected by the authors.

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The data suggest a pattern of interconnected barriers to learning, where difficulties originate predominantly in the pedagogical process but are exacerbated by technological, individual, and relational factors within the learning environment. The concentration of issues in the pedagogical dimension suggests that the way classes are organized and conducted forms the core of this dynamic; when instruction is perceived as overly theoretical, lacking in practical application or focus, or pedagogically flawed, student engagement may decline—manifesting as disinterest, inattention, fatigue, and a loss of focus. At the same time, inadequate or insufficient use of technology, along with side conversations, interruptions, and other environmental distractions, can amplify these difficulties. Thus, the results point to a systemic process in which pedagogical, technological, individual, and behavioral factors interact to hinder Logistics learning. At the same time, structural and organizational limitations appear as less frequent, complementary factors.

4.2 How these factors hinder learning

Table 2 indicates that the factors hindering Logistics learning operate through various mechanisms but primarily converge on reduced attention, concentration, and focus; difficulty comprehending and retaining content; reduced interest; and challenges in connecting theory with practice. Key factors affecting attention and focus include mobile phone use, social media, side conversations, interruptions, and inappropriate use of technology as a teaching method; meanwhile, a lack of focus, technical vocabulary, and the complexity of the subject matter are associated with comprehension difficulties. In turn, a lack of interest, classes perceived as boring, and unengaging teaching reduce student involvement. In contrast, a reliance on theory, a lack of practical activities, and a scarcity of examples hinder the contextualization and application of knowledge. Thus, the data suggest that learning obstacles do not produce a single effect but rather interfere with various stages of the learning process—attention, comprehension, engagement, assimilation, and knowledge application—highlighting a dynamic in which pedagogical, individual, technological, and

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behavioral factors can combine to impede the learning of Logistics in the classroom.

Table 2. How factors hinder learning during classes.

Central effect	Associated factors
Distraction and loss of concentration	Mobile phones, social media, technology, conversations, and interruptions
Loss of focus	Mobile phones, lack of interest, lack of focus, and off-topic discussions
Difficulty understanding	Methodology, lack of focus, technical vocabulary, materials, and lack of interest
Reduced interest	Lack of interest, boring classes, and teaching style
Difficulty fixing content	Side conversations, audiovisual aids, and lack of practical activities
Difficulty articulating theory and practice	Theoretical classes, lack of practical work, and lack of examples

Source: Research data collected by the authors.

The results suggest a chain-reaction logic regarding learning difficulties, in which the identified factors do not act in isolation but trigger successive effects within the learning process. The logic emerging from the data can be represented as follows: interfering factor → alteration in attention or engagement → difficulty with comprehension or assimilation → impaired learning. Thus, factors such as mobile phone use, conversations, and interruptions tend to cause distraction and a loss of focus; pedagogical factors—such as a lack of conciseness, an excess of theory, a lack of practical application, and the use of technical vocabulary—seem to hinder comprehension and contextualization; meanwhile, disinterest, fatigue, and classes perceived as monotonous reduce student engagement. These effects can overlap and reinforce one another; consequently, learning difficulties appear to stem less from a single isolated factor and more from the accumulation and interaction of interferences affecting attention, interest, comprehension, knowledge retention, and application. The results suggest a process that originates from various sources of interference, passes through intermediate cognitive and behavioral mechanisms, and culminates in difficulty learning Logistics content.

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4.3 Why these factors hinder learning

The findings in Table 3 indicate that, from the students' perspective, the factors hindering Logistics learning interfere with fundamental processes such as attention, comprehension, and engagement with the content. Factors related to mobile phone use, social media, side conversations, interruptions, and technology use are primarily associated with distraction, attention deficits, and loss of focus. Conversely, a lack of conciseness, excessive technical terms, complex subject matter, and insufficient examples are perceived as obstacles to understanding and absorbing the material. At the same time, the teaching method, reliance on theory-based classes, lack of practical application, monotony, teaching style, and lack of interest appear linked to reduced student engagement and a decline in the subject's appeal. A lack of equipment and the digital divide hinder activity completion, while scheduling conflicts are tied to financial needs. Thus, the data suggest that difficulty in learning Logistics stems not from a single barrier, but from a combination of factors that successively undermine attention, comprehension, interest, and the ability to connect theoretical knowledge with practice—as students themselves cite.

Table 3. Factors and how they affect learning in Logistics.

Factor/explanatory mechanism	Related factors	How they affect learning	Reasons affecting learning
Attention deficit and loss of focus	Mobile phones; social media; conversations; side conversations; interruptions; lack of focus; technology	Loss of focus, lack of concentration, and distraction	Attention deficit; social media; unrelated topics
Difficulty understanding	Lack of interest; fatigue; mobile phones; technical vocabulary; materials; conversations; audiovisual resources	Lack of understanding of the subject and difficulty retaining information	Lack of understanding; excessive technical jargon; content not absorbed
Monotony and unattractiveness	Method; boring classes; instructor's performance; lack of practical work	Uninteresting and unengaging class	Monotony; lack of appeal; unengaging class
Excessive complexity and little objectivity	Lack of focus/clarity; technical vocabulary; materials	Complex, wordy, and unfocused subject matter	Excessive technical jargon; lack of examples; low effectiveness
Lack of practical contextualization	Theoretical classes; lack of practical work; insufficient	Difficulty connecting and	Lack of hands-on practice; need for

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	practice	retaining the content	practical sessions
Insufficiency of resources and equipment	Lack of equipment; technological exclusion; audiovisual resources	Subject perceived as inaccessible and difficult to work with	Lack of equipment; difficulty accessing or carrying out activities
Low engagement/motivation	Lack of interest; fatigue; boring classes; instructor's performance	Lack of interest and failure to absorb the content	Lack of interest; monotony; unengaging class
Conditions external to the pedagogical process	Scheduling conflicts	Conflict between activities	Financial need
Difficulty following the class	Lack of interest; lack of focus; interruptions	The student fails to keep up with or properly engage with the content	“Failure to learn due to non-attendance”; loss of focus

Source: Research data collected by the authors.

The results suggest a process-based, cumulative dynamic in learning difficulties, in which the factors students identify do not act as isolated obstacles but interfere with multiple stages essential to learning. The pattern emerging from the data can be understood as a sequence: an interfering factor → compromised attention or engagement → difficulty with comprehension and assimilation → impaired learning. Thus, mobile phones, social media, conversations, and interruptions tend to compromise attention and focus initially; subsequently, factors such as a lack of conciseness, an excess of technical terms, complexity, and a lack of examples hinder comprehension; concurrently, monotony, disinterest, a reliance on theory, and a lack of practical application reduce engagement and the ability to relate the content to real-world situations. The ultimate result appears to be a progressive breakdown of the learning process. When a student loses attention or struggles to comprehend the content or connect it to practice, absorbing and retaining knowledge becomes harder. The results suggest that the problem lies not simply in the presence of specific factors, but in how they successively interfere with the conditions necessary for learning: paying attention, comprehending, engaging, connecting theory and practice, and, finally, retaining knowledge.

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4.4 Discussion

The results show that the factors hindering learning in logistics are multidimensional and interdependent, confirming the perspective presented in the literature review. Table 1 shows that pedagogical factors constituted the most frequent group (30.3%), followed by technological (24.2%), individual (21.2%), behavioral and social (18.2%), and structural and organizational (6.1%) factors. This result aligns directly with Morales (2024)—who views learning difficulties as the product of the interaction between personal, pedagogical, and social factors—and with Maican et al. (2025) and Ramos et al. (2025), who advocate for a multifactorial understanding of learning involving cognitive, emotional, social, technological, and contextual dimensions. The predominance of pedagogical factors is particularly significant, as students highlighted a lack of practical application, an excess of theory, poor instructional delivery, a lack of focus, and issues related to teaching methods and instructor performance. This perception is supported by Pan and He (2024), Tan-Abrenica et al. (2024), and Shi and Liu (2025), whose studies show that interactive methodologies, project-based learning, gamification, and adaptive strategies foster student engagement and participation. The results suggest that, in the context investigated, learning difficulties are strongly linked to how knowledge is organized, presented, and connected to practical situations—an aspect particularly relevant in a technology-oriented program such as Logistics. The predominance of pedagogical factors also helps explain the results in Table 2, where the absence of practical activities, an excess of theory, a lack of focus, the use of technical jargon, and insufficient examples are associated with difficulties in comprehension, retention, and integrating theory and practice. This result aligns with literature attributing a central role to pedagogical interaction in the depth of learning. Xu et al. (2025) show that teachers' strategies influence deep learning, with interaction acting as a mediator, while Basister et al. (2025) highlight the importance of developing teachers' pedagogical competencies for instructional organization and teaching effectiveness. Similarly, Pan and He (2024) found that strategies such as the flipped classroom can boost performance by enhancing student engagement.

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Thus, the findings of this study do not merely indicate a student preference for practical classes; rather, they suggest that a lack of contextualization and concrete application can disrupt the progression from content exposure and comprehension to the actual internalization of knowledge. Table 3 reinforces this interpretation, as students link theoretical classes, a lack of practical work, and a lack of examples to difficulty connecting and retaining the material.

Individual factors constituted the third most frequent group, primarily involving fatigue, disinterest, and a lack of attention or focus. Table 2 showed that these factors manifest as a loss of concentration, reduced interest, and comprehension difficulties. In contrast, Table 3 links these manifestations to a lack of understanding, attention deficits, monotony, and disengagement. These results align with the theoretical discussion on self-regulated learning presented by Hartelt and Martens (2024)—who link the ability to manage attention, effort, and cognitive strategies to academic outcomes—and by Bruin et al. (2025), who highlight the relationship between motivation, self-efficacy, cognitive load, and the willingness to invest mental effort. Deng et al. (2024), in turn, demonstrate that classroom distraction and multitasking are associated with reduced cognitive control and impaired academic performance. Thus, empirical data suggest that fatigue, disinterest, and a lack of focus should not be understood merely as isolated individual characteristics, but rather as conditions that affect the student's ability to sustain attention, process information, and persist in learning activities.

The results on the behavioral, social, and technological dimensions also align strongly with the literature. Side conversations, noise, and interruptions are among the main factors compromising attention and concentration; this aligns with Fretes and Palau (2025), who identified negative effects of noise on attention, memory, and comprehension, as well as with Vettori et al. (2024) and Mealings and Buchholz (2025), who highlight the influence of acoustic conditions and multiple sources of speech on listening, learning, and well-being. Regarding technology, the results reveal an ambivalent situation: mobile phones, social media, and electronic devices appear as sources of distraction but are also associated with technological exclusion, a lack of equipment, and insufficient

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resources. This ambivalence mirrors the literature review, which characterizes technology as both an opportunity to enhance learning and a potential source of distraction. Deng et al. (2024), Martin et al. (2025), and Flanigan et al. (2025) link digital distraction to fragmented attention, reduced comprehension, and lower performance, whereas Fahrni et al. (2025), Alam et al. (2025), and Sohail et al. (2025) demonstrate that pedagogically integrated technologies can foster self-regulation, metacognition, engagement, and personalization. Thus, the results reinforce that the issue lies not in the technology itself, but in the relationship between access, pedagogical purpose, self-regulation, and use.

The structural and organizational dimension appeared least frequently among the identified factors, yet these results should not be interpreted as indicating a lack of importance. Students cited a lack of materials and equipment, the digital divide, and the difficulty of balancing study and work—the latter being linked to financial needs in Table 3. These findings align with Andrade et al. (2024), who link infrastructure, materials, and equipment availability to educational outcomes, and with Okoye et al. (2024), who highlight how institutional organization, course workload, and resource access shape the academic experience. Arjanto and Telussa (2024) add that infrastructure improvements, while relevant, do not necessarily yield better results in isolation; they must be integrated with pedagogical and socioeconomic factors. In this sense, the lower frequency of this dimension in the study does not imply that structural conditions are irrelevant; it merely indicates that, among the factors participants spontaneously mentioned, they appeared less often than pedagogical, technological, individual, and behavioral factors. The conflict between work and study itself demonstrates that conditions outside the classroom can impact a student's available time, attention, and participation.

Taken together, the results from Tables 1, 2, and 3 reveal a logical sequence that expands upon and details the multidimensional model proposed in the literature review. Table 1 identifies the sources of difficulties; Table 2 shows how these sources affect attention, focus, comprehension, interest, retention, and the link between theory and practice; and Table 3 outlines the reasons students

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themselves attribute to these effects. Thus, the data suggest a process in which various factors influence intermediate learning conditions: pedagogical, technological, individual, social, and structural problems → compromised attention, interest, or comprehension → difficulty with assimilation, retention, and application → impaired learning. This interpretation is consistent with literature that views learning as a systemic phenomenon in which personal, pedagogical, social, technological, and organizational factors interact (Morales, 2024; Maican et al., 2025). It also reinforces the understanding that the difficulties students encounter cannot be explained solely by student behavior or teaching practices; rather, they must be analyzed based on the interaction among the student, teacher, technology, environment, and learning conditions.

The main contribution of the results to the theoretical discussion is that students not only identify the factors hindering learning but also explain how and why these factors produce this effect. This empirical logic aligns with the theoretical framework presented in Figure 1 of the article, in which individual, pedagogical, behavioral/social, technological, and structural dimensions converge to create classroom learning difficulties. The research adds an explanatory sequence to this framework, as seen in the students' accounts: these factors interfere with attention, engagement, and comprehension; when these conditions are compromised, assimilating, retaining, and applying knowledge becomes more difficult. This interpretation is also consistent with Wang et al. (2026), who highlight the role of student engagement in higher education learning, and with Fahrni et al. (2025), who emphasize the importance of teaching practices that foster self-regulation and metacognition. Thus, the results support the view that improving learning in Logistics requires simultaneously considering the quality of pedagogical mediation, student engagement, the organization of the learning environment, the pedagogical use of technology, and the concrete conditions that support academic participation.

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5 CONCLUSION

This study analyzed the factors hindering learning among first-semester students in the Logistics Technology program during classes, considering individual, pedagogical, behavioral/social, technological, and structural-organizational dimensions. The results showed that learning difficulties are multidimensional and cannot be explained by a single factor. Among the identified factors, those related to the pedagogical dimension stood out—specifically, a lack of practical application, an excess of theoretical lectures, a lack of effective teaching methods, a lack of focus/clarity, and issues with teaching methodology and instructor performance. The study also identified technological, individual, behavioral, and social factors, as well as structural and organizational limitations.

A joint analysis of the three guiding questions made it possible to understand not only which factors hinder learning but also how and why they produce this effect. The results indicated that these factors primarily interfere with attention, focus, comprehension, interest, content retention, and the connection between theory and practice. Mobile phone use, social media, side conversations, and interruptions are associated with distraction and loss of concentration. At the same time, a lack of conciseness, technical vocabulary, content complexity, and a lack of examples hinder comprehension. At the same time, monotony, lack of interest, lecture-based classes, and a lack of practical activities reduce student engagement and make it difficult to connect classroom knowledge with its application.

The study's main conclusion is that the observed learning difficulties appear to form a chained, cumulative process. The identified factors initially affect conditions necessary for learning—specifically attention, interest, and comprehension—and then lead to difficulties in assimilating, retaining, and applying knowledge. The underlying logic can be summarized as follows: interference factor → impairment of attention, interest, or comprehension → difficulty in assimilation and in linking theory and practice → hindrance to learning. Consequently, the results reinforce the understanding that learning in Logistics

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must be analyzed as a systemic phenomenon, wherein student characteristics, pedagogical practices, class behavior, technologies, and structural conditions interact and can exacerbate learning difficulties.

From a pedagogical perspective, the findings highlight the importance of strategies that link Logistics content to practical situations, reduce excessive reliance on purely theoretical classes, clarify explanations, and use examples that support understanding and contextualization of the material. Similarly, the results point to the need to consider the pedagogical use of technology, given that the data revealed an ambivalent situation: technological resources can serve as both a source of distraction and a means of accessing information and supporting learning. It is also necessary to consider the students' individual and organizational circumstances, particularly those related to fatigue, lack of interest, lack of focus, and the challenge of balancing work and study.

The study contributes to understanding learning difficulties in technology-focused degree programs by highlighting (based on students' own perceptions) the relationship between sources of interference, mechanisms that impair learning, and the underlying reasons for these effects. However, interpret the results in light of the study's limitations (specifically, that it was conducted with a specific group of students and relied on a single source of evidence) and factors that limit the findings' generalizability. For future research, it is recommended to increase the number of participants, including different classes and institutions, and combine student perceptions with other sources of evidence, such as classroom observations and interviews with instructors. This would make it possible to verify the extent to which the logic identified in this study holds across different Logistics training contexts and to deepen the understanding of the relationships among attention, pedagogical practices, technology, the classroom environment, and learning.

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Received: 13/01/2026 - **Accepted:** 13/02/2026
Vol: 08.10
DOI: 10.66104/3773z398
Pages: 1-33

REFERENCES

ALAM, T. M.; STOICA, G. A.; ÖZGÖBEK, Ö. Asking the classroom with technology: a systematic literature review. **Smart Learning Environments**, v. 12, n. 1, p. 7, 2025.https://doi.org/10.1186/s40561-024-00348-z.

ANDRADE, A. E.; PADILLA, L.; CARRINGTON, S. J. Educational spaces: The relation between school infrastructure and learning outcomes. **Heliyon**, v. 10, n. 19, 2024. https://doi.org/10.1016/j.heliyon.2024.e38361.

ARJANTO, P.; TELUSSA, R. P. Educational management strategies: linking infrastructure, student activities, and academic performance. **JPPI (Jurnal Penelitian Pendidikan Indonesia)**, v. 10, n. 3, p. 163-174, 2024. https://doi.org/10.29210/020244097.

ASHRAF, M. A.; ALAM, J.; GLADUSHYNA, O. Teachers' perspectives on disruptive student behaviors: The interconnectedness of environment and early childhood education in Pakistan. **Sage Open**, v. 14, n. 1, p. 1- 14, 2024. https://doi.org/10.1177/21582440231221121.

BASISTER, M. P.; PETERSSON, J.; BACONGUIS, R. D. T. Effects of lesson study on the perceived teaching competencies of mathematics and special education teachers. **SAGE Open**, v. 15, n. 3, p. 1-20, 2025. https://doi.org/10.1177/21582440251365692.

BAUER, E. et al. Personalizing simulation-based learning in higher education. **Learning and Individual Differences**, v. 122, p. 102746, 2025. https://doi.org/10.1016/j.lindif.2025.102746.

BETT, A.; TEZZA, R. Fatores que influenciam a aceitação do m-learning da aprendizagem em estruturas do ensino superior da modalidade educação a distância-EAD. **EaD em Foco**, v. 15, n. 1, p. e2495, 2025. https://doi.org/10.18264/eadf.v15i1.2495.

RSV
ISSN 2674-8584

Received: 13/01/2026 - **Accepted:** 13/02/2026
Vol: 08.10
DOI: 10.66104/3773z398
Pages: 1-33

BOLINA, M. A.; MACULAN, B. C. M. S.; ZIVIANI, F. Active methodologies and formative assessment: experience report in a Library Science course. **RDBCI: Revista Digital de Biblioteconomia e Ciência da Informação**, v. 24, p. e026002, 2026. https://doi.org/10.20396/rdbci.v23i00.8679922/en.

BRUIN, A. B. H. et al. Cognitive load and challenges in self-regulation: An introduction and reflection on the topical collection. **Educational Psychology Review**, v. 37, n. 3, p. 65, 2025. https://doi.org/10.1007/s10648-025-10042-2.

CHRISTODOULOU, A.; TSAGKARIDIS, K.; MALEGIANNAKI, A.-C. A multifactorial model of intrinsic/environmental motivators, personal traits and their combined influences on math performance in elementary school. **European Journal of Psychology of Education**, v. 39, n. 4, p. 4113-4135, 2024. https://doi.org/10.1007/s10212-024-00846-1.

DENG, L.; ZHOU, Y.; BROADBENT, J. Distraction, multitasking and self-regulation inside university classroom. **Education and Information Technologies**, v. 29, n. 18, p. 23957-23979, 2024. https://doi.org/10.1007/s10639-024-12786-w.

DUARTE, A. C. T. et al. Impacto das tecnologias digitais na aprendizagem: analisar como as ferramentas digitais como plataformas de e-learning e aplicativos educativos influenciam a aprendizagem e o desenvolvimento dos discentes. **Revista FT**, v. 38, n. 139, p. 1-18, 2024. https://doi.org/10.69849/revistaft/th102410280534.

FAHRNI, D. D. D. et al. Teachers' practices in the use of digital technology to promote students' self-regulated learning and metacognition: A systematic review. **Teaching and Teacher Education**, v. 165, p. 105150, 2025.

FLANIGAN, A. E. et al. The interplay among digital distraction, self-regulation of learning tendencies, and motivational influences: A transnational investigation.

RSV
ISSN 2674-8584

Received: 13/01/2026 - **Accepted:** 13/02/2026
Vol: 08.10
DOI: 10.66104/3773z398
Pages: 1-33

The Internet and Higher Education, v. 67, p. 101023, 2025. https://doi.org/10.1016/j.iheduc.2025.101023.

FRETES, G.; PALAU, R. The impact of noise on learning in children and adolescents: a meta-analysis. **Applied Sciences**, v. 15, n. 8, p. 4128, 2025. https://doi.org/10.3390/app15084128.

HARTELT, T.; MARTENS, H. Self-regulatory and metacognitive instruction regarding student conceptions: influence on students' self-efficacy and cognitive load. **Frontiers in Psychology**, v. 15, p. 1450947, 2024. https://doi.org/10.3389/fpsyg.2024.1450947.

KABAÇALI, N. B.; ÇETİNKAYA, L.; KESER, İ. The regulatory effect of physical activity on perceived fatigue from digital technology use in schools. **Health Education & Behavior**, v. 53, n. 2, p. 149-159, 2025. https://doi.org/10.1177/10901981251362826.

KUMI-YEBOAH, A. et al. Addressing the role of technology in internationalization at a distance: Voices of students' in international distance learning from Ghana—sub-Saharan Africa. **British Journal of Educational Technology**, v. 56, n. 2, p. 890-908, 2025. https://doi.org/10.1111/bjet.13552.

LI, K. et al. Exploring the factors affecting elementary mathematics teachers' innovative behavior: An integration of social cognitive theory. **Scientific Reports**, v. 14, n. 1, p. 2108, 2024. https://doi.org/10.1038/s41598-024-52604-4.

LI, Q. Adaptive recommendation of teaching content in higher education using mobile interaction technology. **International Journal of Interactive Mobile Technologies**, v. 18, n. 24, p. 115–129, 2024. https://doi.org/10.3991/ijim.v18i24.53091.

CC BY

RSV
ISSN 2674-8584

Received: 13/01/2026 - **Accepted:** 13/02/2026
Vol: 08.10
DOI: 10.66104/3773z398
Pages: 1-33

LI, Y. The mechanism of self-regulated learning among rural primary and middle school students: Academic delay of gratification and resilience. **Learning and Motivation**, v. 87, p. 102013, 2024. https://doi.org/10.1016/j.lmot.2024.102013.

MAICAN, C. I. et al. The role of contextual and individual factors in successful e-learning experiences during and after the pandemic–a two-year study. **Journal of Computers in Education**, v. 12, n. 2, p. 589-624, 2025. https://doi.org/10.1007/s40692-024-00323-0.

MARTIN, F. et al. Digital distractions in education: a systematic review of research on causes, consequences and prevention strategies. **Educational Technology Research and Development**, p. 1- 29, 2025. https://doi.org/10.1007/s11423-025-10550-6.

MARTÍNEZ-CORCUERA, R. et al. Podcasting in higher education: Learning experiences in face-to-face and blended modalities. **Center for Educational Policy Studies Journal**, p. 1- 24, 2026. https://doi.org/10.26529/cepsj.1933.

MAYOMBE, C. The role of self-directed learning in enhancing entrepreneurial learning of students in higher education institutions. **Education Sciences**, v. 15, n. 5, p. 629, 2025. https://doi.org/10.3390/educsci15050629.

MEALINGS, K.; BUCHHOLZ, Joerg M. The effect of classroom acoustics and noise on preschool children's listening, learning, and wellbeing: A scoping review. **Building Acoustics**, v. 32, n. 1, p. 109-121, 2025. https://doi.org/10.1177/1351010X241286267.

MORALES, V. J. Um Olhar psicopedagógico aos fatores que dificultam a aprendizagem dos estudantes da escola superior pedagógica do Bengo. **Revista Ciências Humanas**, v. 17, n. 2, p. 98-112, 2024. https://doi.org/10.32813/2179-1120.2024.v17.n2.a1059.

CC BY

RSV
ISSN 2674-8584

Received: 13/01/2026 - **Accepted:** 13/02/2026
Vol: 08.10
DOI: 10.66104/3773z398
Pages: 1-33

NASCIMENTO-E-SILVA, D. **Handbook of the scientific-technological method**: Synthetic edition. Manaus: DNS Editor, 2021a. https://doi.org/10.5281/zenodo.19035456.

NASCIMENTO-E-SILVA, D. **Manual do método científico-tecnológico**: edição sintética. Florianópolis: DNS Editor, 2020. https://doi.org/10.5281/zenodo.19035103.

NASCIMENTO-E-SILVA, D. **O método científico-tecnológico**: coleta de dados. Manaus: DNS Editor, 2023. https://doi.org/10.5281/zenodo.19570428.

NASCIMENTO-E-SILVA, D. **O método científico-tecnológico**: fundamentos. Manaus: DNS Editor, 2021b. https://doi.org/10.5281/zenodo.19142042.

NASCIMENTO-E-SILVA, D. **O método científico-tecnológico**: organização de dados. Manaus: DNS Editor, 2026. https://doi.org/10.5281/zenodo.20628502.

NASCIMENTO-E-SILVA, D. **O método científico-tecnológico**: questões de pesquisa. Manaus: DNS Editor, 2021c. https://doi.org/10.5281/zenodo.19142187.

OKOYE, K. et al. Analyzing the impact of digitized-education toward the future of education: a comparative study based on students' evaluation of teaching data. **Studies in Educational Evaluation**, v. 82, p. 101359, 2024. https://doi.org/10.1016/j.stueduc.2024.101359.

OPABOLA, E. A.; GALASSO, C. Informing disaster-risk management policies for education infrastructure using scenario-based recovery analyses. **Nature Communications**, v. 15, n. 1, p. 325, 2024. https://doi.org/10.1038/s41467-023-42407-y.

PAN, Y.; HE, W. Research on the influencing factors of promoting flipped classroom teaching based on the integrated UTAUT model and learning engagement theory. **Scientific Reports**, v. 14, n. 1, p. 15201, 2024. https://doi.org/10.1038/s41598-024-66214-7.

RSV
ISSN 2674-8584

Received: 13/01/2026 - **Accepted:** 13/02/2026
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DOI: 10.66104/3773z398
Pages: 1-33

RAMOS, D. K.; ANASTACIO, B. S.; ALMEIDA, R. P. Impactos pós-pandemia sobre as dimensões da aprendizagem escolar. **Educação**, v. 48, n. 1, p. e47800-e47800, 2025. https://doi.org/10.15448/1981-2582.2025.1.47800.

REHO, M. et al. Development and factor structure of the teaching approach scale. **Frontiers in Education**, v. 9, p. 1404326, 2024. https://doi.org/10.3389/feduc.2024.1404326.

ŠAŠIĆ, S. Š.; ATLAGA, M. Student perception of teacher encouragement of self-regulated learning and its relationship with self-regulation learning strategies. In: **Frontiers in Education**. Frontiers Media SA, 2024. p. 1407584. https://doi.org/10.3389/feduc.2024.1407584.

SHI, P.; LIU, W. Adaptive learning oriented higher educational classroom teaching strategies. **Scientific Reports**, v. 15, n. 1, p. 15661, 2025. https://doi.org/10.1038/s41598-025-00536-y.

SOHAIL, A. et al. Integrating technology and self-regulation strategies to enhance learning outcomes: A dual-analysis approach. **Interactive Learning Environments**, p. 1-13, 2025. https://doi.org/10.1080/10494820.2025.2523401.

SWAI, C. T. A systematic review of classroom technologies supporting student centered teaching. **Discover Education**, v. 4, n. 1, p. 564, 2025. https://doi.org/10.1007/s44217-025-00932-6.

TAN-ABRENICA, G. C. et al. Innovative teaching techniques for enhancing classroom engagement in elementary education. **International Journal of Research and Innovation in Social Science**, v. 8, p. 679-682, 2024. https://dx.doi.org/10.47772/IJRISS.2024.8120054.

VETTORI, G. et al. The sound of silence: children's own perspectives on their hearing and listening in classrooms with different acoustic conditions. **European**

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Vol: 08.10
DOI: 10.66104/3773z398
Pages: 1-33

Journal of Psychology of Education, v. 39, n. 4, p. 3803-3823, 2024. https://doi.org/10.1007/s10212-024-00819-4.

VISENTIN, C.; PRODI, N. Let's get loud: how classroom activities influence speech and noise levels during lessons. **Building and Environment**, p. 113959, 2025. https://doi.org/10.1016/j.buildenv.2025.113959.

WANG, F.; JIANG, S. Adopting AI-powered chatbots for academic performance: A qualitative model based on grounded theory approach. **African Educational Research Journal**, v. 13, n. 1, p. 52-64, 2025. https://doi.org/10.30918/AERJ.131.25.006.

WANG, L. et al. Factors related to student engagement in blended learning in higher education: A narrative synthesis based on a systematic review. **Computers & Education**, p. 105625, 2026. https://doi.org/10.1016/j.compedu.2026.105625.

XINFA, T. et al. Enhancing educational through blended teaching: an analysis of teaching and learning quality with learning environment and social impacts. In: **Frontiers in Education**. Frontiers Media, 2025. p. 1584739. https://doi.org/10.3389/feduc.2025.1584739.

XU, Z. et al. The impact of teachers' teaching strategies on students' deep learning in online learning environments: the mediating role of learning interaction. In: **Frontiers in Education**. Frontiers Media, v. 10, p. 1680937, 2025. https://doi.org/10.3389/feduc.2025.1680937.

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