

Behavioral insights applied to the academic performance factor as a suggestion to combat student dropout in federal university undergraduate programs

Insights comportamentais aplicados ao fator desempenho acadêmico como sugestão de enfrentamento à evasão dos alunos na graduação das universidades federais

Insights conductuales aplicados al factor rendimiento académico como sugerencia para combatir la deserción estudiantil en carreras de pregrado en universidades federales

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ABSTRACT

This is a theoretical essay that aims to identify possible contributions to be offered by behavioral science to tackle the problem of dropout rates in federal public higher education in Brazil. We started with the causes identified in the literature for abandonment of undergraduate courses, with the selection of one of the relevant factors (academic performance) to explore, using the *SIMPLES MENTE* tool, how behavioral insights can contribute to the development of strategies that reduce dropout rates. The concluding theoretical reflection of the essay points out that behavioral elements associated with academic performance (class attendance; proactivity and assiduity in studying; student participation in reinforcement/academic support activities; student integration into the academic context; and recognition of student effort) can be enhanced through behavioral insights.

Keywords: Dropout. Higher Education. Behavioral Insights.

RESUMO

Trata-se de um ensaio teórico que se propõe a identificar possíveis contribuições a serem oferecidas pela ciência comportamental para o enfrentamento do problema de evasão na educação superior pública federal no Brasil. Partiu-se das causas identificadas na literatura para o abandono dos cursos de graduação, com a seleção de um dos fatores relevantes (desempenho acadêmico) para se explorar, com o uso da ferramenta *SIMPLES MENTE*, como os *insights* comportamentais podem contribuir para o desenvolvimento de estratégias que diminuam a evasão. A reflexão teórica final do ensaio aponta que os elementos comportamentais associados ao desempenho acadêmico (frequência às aulas; proatividade e assiduidade no estudo; participação do aluno em atividades de reforço/auxílio

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acadêmico; integração do aluno ao contexto acadêmico; e reconhecimento do esforço do aluno) podem ser beneficiados por meio de *insights* comportamentais.

Palavras-chave: Evasão. Educação Superior. *Insights* Comportamentais.

RESUMEN

Este es un ensayo teórico que tiene como objetivo identificar posibles contribuciones que pueden ofrecer las ciencias del comportamiento para abordar el problema de la deserción escolar en la educación superior pública federal en Brasil. Partimos de las causas identificadas en la literatura para el abandono de carreras de pregrado, con la selección de uno de los factores relevantes (rendimiento académico) para explorar, utilizando la herramienta SIMPLES MENTE, cómo los *insights* conductuales pueden contribuir al desarrollo de estrategias que reduzcan la evasión. La reflexión teórica final del ensayo señala que los elementos comportamentales asociados al rendimiento académico (asistencia a clases; proactividad y asiduidad en el estudio; participación del estudiante en actividades de refuerzo/ayuda académica; integración del estudiante al contexto académico; y reconocimiento de su esfuerzo) pueden beneficiarse a través de *insights* conductuales.

Palabras clave: Evasión. Educación Superior. *Insights* Conductuales.

INTRODUCTION

Dropout in higher education, particularly in undergraduate programs, has emerged as a managerial challenge for federal universities in Brazil (ANDIFES, ABRUEM and SESU/MEC, 1996; Prestes and Fialho, 2018; Assunção *et al.*, 2023), as the presence of students who enter the university system but do not complete their courses represents a social, academic, and economic loss. This situation renders the public investment in maintaining academic infrastructure ineffective and compromises human and regional development (Morosini *et al.*, 2012; Sales Junior *et al.*, 2016; Coimbra, Silva and Costa, 2021; Santos, Pilatti and Bondarik, 2022; Pfeiffer, Prestes and Santos, 2023).

The National Institute for Educational Studies and Research Anísio Teixeira (INEP), through the Higher Education Census, analyzes students' trajectories during undergraduate courses, considering three directions: dropout rate (students who have withdrawn or transferred from courses), completion rate, and retention rate. The results of the 2023 Higher Education Census (Brasil, 2024) reveal the impact of dropout rates in the country's higher education: considering all courses in Brazil, in both public and private institutions, of the students who enrolled in 2013, after ten years of follow-up (2013–2022), 58% dropped out, 41% graduated, and 1% were still enrolled in the course, showing a cumulative dropout rate significantly higher than the cumulative completion rate.

Dropout is a complex educational phenomenon that affects different levels of education and administrative categories (public or private) and can be triggered by multiple causes (Morosini *et al.*, 2012; Araújo, Silva and Pederneiras, 2021; Coimbra, Silva and Costa, 2021; Santos, Pilatti and Bondarik, 2022; Assunção *et al.*, 2023). This has led authors to develop and refine theories that consider variables encompassing situations such as: i. personal characteristics of the student; ii. characteristics of the higher education institution (HEI); and iii. aspects related to the external environment (Morosini *et al.*, 2012; Sales Junior *et al.*, 2016; Araújo, Silva and Pederneiras, 2021).

On the one hand, there are issues that depend on modifications to the organizational structure of HEIs — such as policies for access and retention in higher education and reformulation of curricula (Araújo, Silva and Pederneiras, 2021; Santos, Pilatti and Bondarik, 2022) — as well as aspects that

even precede students' entry into undergraduate programs, such as the robustness of their prior schooling (Sales Junior *et al.*, 2016; Pfeiffer, Prestes and Santos, 2023). On the other hand, there are individual student behaviors that influence the decision to drop out or persist in the course, which can be addressed through a careful approach and intervention proposals from behavioral sciences.

Behavioral sciences are an interdisciplinary field of knowledge that emerged throughout the 20th century, supported by the historical development of areas such as psychology — e.g., experimental psychology, which deals with the scientific investigation of human behavior and its mental and emotional processes through controlled experiments (Dobson and Bruce, 1972); sociology, with studies aimed at understanding social behaviors, social structures, and human interactions (Lucchini, 2008); anthropology, with research on human behavior in cultural and social contexts (Sherif, 1959); and behavioral economics, which combines principles of economics and psychology, notably through the work of Daniel Kahneman and Amos Tversky, who studied cognitive biases and psychological influences on economic decisions, challenging the traditional assumption that individuals always make rational decisions (Tversky and Kahneman, 1974; Santos, 2010).

Behavioral sciences aim to understand and explain human behavior and the mental processes that support it by investigating both individual and collective aspects. They seek to understand how individuals relate to themselves, to others, and to the environment in which they are embedded (Senna, Souza and Vogel, 2021).

In this context, it is believed that theoretical perspectives from behavioral sciences can be used to provide practical insights for addressing the complex phenomenon of academic dropout in undergraduate education, considering its multiple individual, social, and institutional factors. This raises the following research question: can behavioral insights be applied to tackle student dropout in undergraduate programs at Brazilian federal universities?

The research objectives are to explore the principles and concepts of behavioral science to reflect on how behavioral insights can be applied to address dropout, considering the causes already identified in the literature for this phenomenon. Additionally, to incorporate a practical aspect into this reflection, the study aims to identify, through the *SIMPLES MENTE* method, possible approaches that higher education institutions can implement to address a relevant identified cause — in this case, academic performance.

To this end, the next section will present the main causes of undergraduate student dropout in higher education as identified in the literature. Subsequently, possible behavioral issues related to this matter will be outlined, along with some applicable theories. Following this, the *SIMPLES MENTE* method will be introduced and its application as a tool for developing proposals to address the problem will be discussed, along with the final considerations.

DROPOUT IN HIGHER EDUCATION: SOME CAUSES IDENTIFIED IN THE LITERATURE

For the purposes of this study, dropout will be understood as the abandonment of an undergraduate course by the student (Sales Junior *et al.*, 2016; Santos, Pilatti and Bondarik, 2022), that is, the *“definitive departure of the student from their original course, without completing it”* (ANDIFES, ABRUEM and SESU/MEC, 1996). This is referred to as an understanding for the purposes of this study because it is a concept that admits different approaches (ANDIFES, ABRUEM and SESU/MEC, 1996; Morosini *et al.*, 2012; Coimbra, Silva and Costa, 2021). In mapping the bibliographic production on the subject, Coimbra, Silva and Costa (2021) point to the existence of diverse definitions, which have led them to develop a framework containing 13 works and their respective concepts. However, according to the authors, most definitions use different expressions to address a convergent issue, namely, disconnection (from the course, the institution, or the education system), whether by the voluntary act of the student or not.

Regarding the state of the art on the subject, there is the bibliographic review conducted by Araújo, Silva, and Pederneiras (2021) through the Coordination for the Improvement of Higher Education Personnel (CAPES) theses and dissertations database and the Scientific Electronic Library Online (SciELO) system, considering publications that occurred between the years 2016 and 2020 on the topic of dropout in higher education. This search identified 27 works, grouped into five categories of analysis:

a) elements that contribute to student dropout; b) dropout and adaptation to the university context; c) dropout, evening courses, and work-study reconciliation; d) dropout, affirmative access and retention policies, and the adoption of SISU [Unified Selection System]; and e) strategies used for the prevention and combating of dropout. (Araújo, Silva and Pederneiras, 2021, p. 259)

In general terms, the authors highlighted that factors such as the individual's vocational guidance, the strength of their prior education, difficulties in the student-teacher relationship, low academic performance, financial difficulties in supporting the student even in public institutions, and the need to reconcile work and study, among others, impact the decision to drop out or not.

They also noted the diversity of studies showing that higher dropout rates occur at the beginning of the course, especially in the first semester, demonstrating the importance of adapting to the university environment in the decision to continue or not in the course. As causes of this decision, issues such as adapting to the new teaching methodology, integrating with other students, the availability of tutoring and monitoring, among others, were mentioned.

Furthermore, specifically regarding the student-teacher interaction, the authors found evidence that the discourse of some teachers blaming students for low academic performance contributes to dropout from the course (Araújo, Silva and Pederneiras, 2021).

These findings are supported by the study conducted by Oliveira Junior, Dalmau, and Souza (2022) with managers, teachers, and students, including those who dropped out of the philosophy course at the Federal University of Mato Grosso do Sul (UFMS). This study verified that a lack of identification with the course, limited job market prospects, difficulties in reconciling work and study, and poor academic performance are common reasons for dropout.

Pfeiffer, Prestes, and Santos (2023) also point out these same aspects, highlighting the lack of academic and pedagogical support, as well as the inadequacy of high school education, as factors that contribute to dropout.

From another perspective, analyzing the factors that interfere with the decision to stay in the course, Assunção *et al.* (2023) conducted a survey study with a sample of 790 students from the Federal Institute of Minas Gerais, and identified that the institution's commitment to providing adequate structural conditions, clear goals, and engagement actions influences the students' commitment to the institution, which is relevant in the decision to remain.

In a study conducted with students who entered undergraduate face-to-face courses at the Federal University of Espírito Santo via entrance exams between 2006 and 2011, Sales Junior *et al.* (2016) identified that, even in the presence of other factors, student participation in assistance programs, involvement in research, and involvement in internships were highly predictive of non-dropout. According to the authors, students who received assistance, research scholarships, or participated in internships had, respectively, a 65, 60, and 95% lower chance of dropping out compared to students who did not participate in these programs.

Regarding student assistance, Sales Junior *et al.* (2016) suggest that the benefit arises from aspects that go beyond the material, pointing to issues such as the indication of the student's integration with the institution (as there is an assumption that the enjoyment of the benefit occurs

because the student is informed about their rights, rules, and procedures), as well as the feeling of gratitude that the measure can evoke in the student, which in turn can increase commitment and retention in the course.

Regarding the benefits arising from involvement in research and internships, the authors point to the increase in academic integration, as well as the perception of these experiences as academic rewards, noting that academic performance is identified as a relevant factor in the decision to stay or drop out:

In his theory, Tinto (1975; 1997) states that academic performance is a fundamental factor in a student's decision to stay in the course. The author emphasizes that educational outcomes are related to various other factors, such as prior education and commitment to the institution and objectives, and therefore academic performance is seen as an explicit reward that reinforces the student's motivation to continue performing well and obtaining more rewards, directly influencing the decision to stay or drop out. The results of this study reinforce this theory, detecting a strong association between academic performance variables and the form of exit. The results showed that academic performance is a good indicator for predicting dropout. Thus, it can be stated that a low-grade point average and a high number of failures in subjects considerably increase the chances of student dropout.

In this study, the results of the logistic regression allow us to state that, when compared to students who did not fail any subjects, students with one or two failures have, on average, 1.1 times higher chances of dropout; students who failed three to five times have, on average, 8.4 times higher chances of dropout; students who failed six to ten times have 14.8 times higher chances of dropout; and those who failed more than ten times have, on average, 61.7 times higher chances of dropout. (Sales Junior *et al.*, 2016, p. 506-507)

Specifically regarding involvement in internships, the situation also presents itself as a stimulus to the expectation of employability in the job market after graduation, given the experience gained during the course. In this regard, the authors highlight the existence of a study that associates dropout with the lack of job opportunities during the course, a finding also presented by Oliveira Junior, Dalmau, and Souza (2022).

Also noteworthy among the findings of the study by Sales Junior *et al.* (2016) is the result regarding the group of independent variables termed 'intentions regarding goals and commitments,' which indicates that students who were less prone to dropout: i. chose the course seeking professional qualification for the exercise of a profession; ii. considered the chosen course to be suitable for their vocation and personal aptitude; iii. had not yet started a higher education course. According to the authors:

These results present two suggestions regarding the student's commitment to their goals: (i) a student who has dropped out of a course once may do so a second time, as a lack of commitment to goals may be a trait of their personality; and (ii) students who have already graduated from a higher education course and may have already entered the job market do not have the same determination as students who are seeking their first higher education diploma. (Sales Junior *et al.*, 2016, p. 505)

Finally, it is important to highlight the study conducted by the Special Commission created in 1995 within the Ministry of Education (MEC), which involved the Secretariat of Higher Education (SESU), the National Association of Leaders of Federal Institutions of Higher Education (ANDIFES), and the Brazilian Association of Rectors of State and Municipal Universities (ABRUEM). This study

aimed to gather data on graduation, retention, and dropout rates of students in undergraduate courses at Brazilian public universities, thus seeking to understand these institutions' performance.

The aforementioned study culminated in a Final Report (ANDIFES, ABRUEM and SESU/MEC, 1996), which, after identifying quantitative data that allow for a better understanding of the phenomenon, presented several hypotheses regarding the causes of dropout, classified into three categories (those related to the student; those related to the course and the institution; and those related to external socio-cultural and economic factors), with the note that there is a close interrelationship among many of them. A detailed indication of these hypotheses will not be provided, recognizing that those relevant to this study have already been addressed in the previously cited studies.

BEHAVIORAL PROBLEMS: BRIEF CONSIDERATIONS AND SOME APPLICABLE THEORIES

There are situations in everyday life in which individuals believe they have good reason to act in a certain way, yet still adopt different behaviors, challenging the strict rationality of the rational agent model (Campos Filho, Sigora and Bonduki, 2020; Lichand, Serdeira and Rizardi, 2022). In the present investigation, according to the literature reviewed, there may be behavioral aspects in students' individual actions that influence their decision to drop out or remain in the undergraduate program they are attending.

Various theories from the behavioral sciences can help to understand the motivational factors that influence human decision-making and may contribute to the present investigation.

The first examples are some of the existing motivation theories (e.g., Maslow's theory of human motivation, which posits a hierarchy of human needs organized at different levels, from basic physiological needs to self-actualization needs (Sampaio, 2009); Victor Vroom's expectancy theory, which emphasizes that people are motivated to take action when they believe that their effort will lead to good performance, that good performance will be rewarded, and that the rewards are valued by them (Vroom, 1964); and the self-determination theory by Edward Deci and Richard Ryan, which seeks to explain how intrinsic motivation and self-determination influence human behavior, emphasizing autonomy, competence, and social connection as important psychological needs for human motivation (Deci and Ryan, 1985; Martelo *et al.*, 2018).

Social learning theory, which highlights that people learn through observation (observational learning), imitation of others' behaviors (modeling), and the consequences of those behaviors (vicarious reinforcement); as well as social cognitive theory, which advances and expands this perspective to include cognitive processes (thoughts, beliefs, and self-efficacy) in explaining human behavior (Bandura, Azzi and Polydoro, 2008; Nabavi and Bijandi, 2012), can also be used to analyze occurrences of school dropout. This is due to the importance of both social aspects (e.g., examples of other students who dropped out and their consequences) and cognitive aspects (e.g., a student's belief in their ability to overcome challenges) in understanding this dropout behavior.

Furthermore, the theory of identity and belonging, according to which identity is a social and psychological construct developed through belonging to different social groups — such as family, community, school, ethnicity, religion, and nationality, among others — can be useful to explore the impact of individual identity and the sense of belonging to a group on student behavior (Copatti, Ziech and Callai, 2016; Silva, 2019; Santana Filho, 2021). Since university dropout may be related to a lack of identification with the academic environment, difficulties in social integration, or identity conflicts, understanding how identity and the sense of belonging affect dropout rates can provide valuable insights for developing intervention strategies.

Finally, there is the field of behavioral economics, which combines principles of traditional economics with insights from psychology to understand how people make economic decisions and which behavioral and psychological factors may influence their choices — often challenging the traditional economic assumption that individuals are rational and make decisions solely based on costs and benefits (Kahneman, 2012; Thaler, 2015).

In the context of university dropout, behavioral economics can provide an additional perspective to understand why students abandon their studies, exploring the underlying motivations and psychological factors that influence their decision to leave the course.

Some examples include present bias — the tendency to place greater value on immediate benefits rather than future rewards (Kahneman, 2012) — which can lead students to undervalue the long-term benefits of education and prioritize instant gratification, resulting in school dropout; loss aversion — people tend to be more sensitive to losses than to gains (Kahneman and Tversky, 1979) —, so if students perceive education as a negative experience or feel they are missing out on other opportunities by staying in school, they may be more likely to drop out; lack of self-control — the inability to self-regulate and the tendency to give in to immediate impulses (Thaler, 2015); and the previously mentioned social influence (students' decision-making can be influenced by their peers and social environment, with examples of dropout leading to further dropout cases).

Finally, nudge theory (Thaler and Sunstein, 2019), recognizing that human beings do not always make rational decisions and are influenced by psychological, social, and environmental factors, seeks to modify the decision-making context through subtle interventions, known as “nudges.” These interventions aim to influence people's choices in a predictable way without imposing restrictions or prohibitions, encouraging more positive and beneficial behaviors.

In the academic context, nudges can be applied to promote behaviors and practices that improve student performance (Damgaard and Nielsen, 2017; O'Connell and Lang, 2017; Blumenstein *et al.*, 2018; Smith *et al.*, 2018; Castleman and Meyer, 2020; Seah and Tan, 2023).

Based on these and other theories, tools have been developed for their practical application, particularly in public policies (Campos Filho, Sigora and Bonduki, 2020; Lichand, Serdeira and Rizardi, 2022).

For the present study, the *SIMPLES MENTE* tool will be explored, which aims to assist in the application of some of the most robust elements identified by behavioral economics (Campos Filho, Sigora and Bonduki, 2020) and will be chosen to support the presentation of an intervention proposal for the problem of university dropout in the federal public network.

SIMPLES MENTE METHOD

The *SIMPLES MENTE* tool was developed to work with the most robust behavioral elements identified in the literature, based on empirical evidence and best international practices, with great potential for practical application in improving public policies (Campos Filho, Sigora and Bonduki, 2020). It is recommended in the practical guide of the UN Innovation Network — UNIN (2022, Annex B) as one of the resources to be used in United Nations (UN) policies and programs involving behavioral sciences.

In Brazil, the *SIMPLES MENTE* tool has already been applied by the National Electric Energy Agency (Aneel) in a study to improve the tariff flag system in electricity bills (Campos Filho, Sigora and Bonduki, 2020), and by the Federal Revenue Service of Brazil in a study to optimize communication with taxpayers and improve compliance with obligations (Fontes, 2020).

The tool covers 12 key aspects of behavioral sciences in accordance with its acronym, where the letters stand for:

- “S” for simplification, which means making something easier by removing unnecessary barriers related to time, effort, and understanding. Simplifying processes can compensate for people’s limited attention and information-processing capacity, contributing to better outcomes;
- “I” for incentives, which are the rewards for adopting the expected behavior. To be more effective, they must consider patterns of human psychology that go beyond strictly rational behavior;
- “M” for messenger, which suggests that one must consider the influence of the messenger on how the message will be received by the recipients, ultimately impacting the success or failure of the intended strategy;
- “P” for priming, which is associated with subliminal stimuli. Exposure to certain agents — colors, sounds, words — can affect the unconscious way of responding to subsequent events;
- “L” for reminders and commitments (*lembretes*, in Portuguese). Given limited attention and self-control, reminders and commitments can help draw attention to the goals that need to be achieved;
- “E” for emotion, which has been recognized as inherent to decision-making, and its management is a component to be considered in the design and implementation of public policy;
- “S” for salience, which suggests that, due to the limited capacity of attention, giving proper emphasis to an important factor at the moment of decision-making can contribute to a better outcome of a public policy;
- “M” for mental models, which are linked to mental representations — constructs such as stereotypes, narratives, and worldviews derived from culture — that guide human behavior and should be considered;
- “E” for ego, which is related to self-perception. People tend to act in ways that make them feel better about themselves, in order to maintain a positive self-image, often with the bias of overestimating their abilities in relation to others;
- “N” for social norms. People seek conformity with the behavior of their groups, a factor that can be used to alter individual behavior that is dissonant with these social norms;
- “T” of tendency for the default, which indicates that people tend to follow the standard behavior of their group. Therefore, there are cases where comparison can be highly positive. Additionally, considering the individual’s inertial behavior allows the use of default choices as a powerful behavioral tool; and
- “E” for scarcity (*escassez*, in Portuguese) — the feeling of having more needs than resources — causes people to experience a reduction in cognitive capacity and executive control, which can lead to what is known as the tunnel effect, meaning less favorable decisions are made by ignoring promising alternatives that are outside the narrow focus of problem-solving (Campos Filho, Sigora and Bonduki, 2020).

Each of these 12 elements of the *SIMPLES MENTE* acronym is analyzed based on four different card proposals (and colors), which are available online (Campos Filho, 2019) and aim to guide the process of better understanding the problem to propose innovative solutions through behavioral insights. The four sets, each with 12 cards, are as follows:

- 1) reference cards (red cards): describe the main concepts related to the key aspect and aim to bring reflections that allow a deeper look into the problem, considering the various nuances involved;
- 2) insight cards (yellow cards): simulate reflections to expand the understanding of the issue under analysis, for example, regarding the behavioral aspect involved in the key aspect;

- 3) example cards (blue cards): aimed at identifying experiences in which each behavioral element was applied, facilitating its understanding; and
- 4) application cards (green cards): present strategies that have been used in different contexts and can inspire interventions for the case under analysis.

As seen, the 12 key aspects of the acronym are analyzed through the four sets of cards, totaling up to 48 cards to be answered, depending on the behavioral element under analysis. There is no obligation to follow the order of the acronym's letters or to obtain a relevant answer for all the cards, as some of them may not provide insights for the specific case (Campos Filho, 2019; Campos Filho, 2020; Campos Filho, Sigora and Bonduki, 2020).

Finally, the *SIMPLES MENTE* methodology was developed to be applied in three distinct stages: i. defining the challenge that will be the focus of the behavioral approach; ii. analyzing the behavioral elements associated with the challenge to be addressed, using the red and yellow cards; and iii. developing strategies to tackle the challenge, using the blue and green cards (Campos Filho, 2020).

APPLICATION OF THE *SIMPLES MENTE* METHOD

DEFINITION OF THE CHALLENGE

As mentioned, the application of the *SIMPLES MENTE* method begins with identifying the aspect to be analyzed and the goal to be pursued as a proposal to address this aspect.

In this first stage, considering the various causes of dropout identified in the literature, as mentioned in the previous section, "academic performance" (recognized as a fundamental factor in a student's decision to stay in or leave the course) was chosen as the challenge to be addressed using the behavioral approach. This does not exclude the possibility of applying the method to other causes of dropout that can also be addressed through behavioral sciences.

The studies that identify academic performance as a relevant factor for dropout in undergraduate courses at Brazilian universities (e.g., Oliveira Junior, Dalmau and Souza, 2022), however, do not specify the particular behaviors associated with this factor. Therefore, the analysis in this theoretical essay will be based on hypothetical student behaviors that impact academic performance, which will be presented later.

In this context, the suggestions presented at the end are a reflective and theoretical effort aimed more at encouraging this investigative process — with examples that can be adapted to different realities — rather than serving as a directive for implementation.

Furthermore, it will be proposed as a goal that the academic performance of all students exceeds 80% — a target that intentionally exceeds the grade required for approval in the subjects, as it is understood that this increase will make the goal even more challenging, stimulating interest.

Next, we proceed to the identification of the behavioral elements associated with academic performance.

ANALYSIS OF THE BEHAVIORAL ELEMENTS ASSOCIATED WITH THE CHALLENGE

Considering the challenge of having undergraduate students achieve academic performance above 80%, the decomposition of this goal into behavioral components was carried out, resulting in the identification of the following actions: presentation of the course by the professor, understanding of the course by the student, revising for exams, and proper correction of them. These behaviors were further decomposed, leading to actions that may or may not be suitable for a behavioral approach. The elements that were understood as appropriate for the implementation of a behavioral approach and will be the target behaviors of this study are:

- attendance in classes;
- proactivity and consistency in studying;
- student participation in academic support/reinforcement activities;
- integration of the student into the academic context;
- recognition of the student's effort and improvement in their academic performance.

These target behaviors will be the focus of the application of the *SIMPLES MENTE* tool. However, before that, some observations are necessary.

Regarding attendance in classes, it should be acknowledged that there is the possibility of difficulties arising, for example, from the cost of commuting to the university (such as failures in student assistance programs) or even from scheduling conflicts due to potential overlap with paid work (which may also be a result of failures in student assistance programs and/or in the granting of research and/or internship scholarships), which are hindering class attendance. These aspects relate to the organizational and managerial aspects of universities, which also significantly impact student dropout, as previously discussed by Sales Junior *et al.* (2016) and Oliveira Junior, Dalmau, and Souza (2022).

Similarly, the managerial organization of the university also has a significant impact both on the student's participation in academic support/reinforcement activities and on the integration of the student into the academic context.

Academic support activities can be provided through the granting of tutoring or mentoring, as well as through various other means, such as pre-existing knowledge leveling courses. These activities are often necessary for students with social vulnerability, reinforcing the importance of strengthening policies by higher education institutions for student assistance in a broad sense, i.e., scholarships, food, housing, financial aid, offering paid internships, and providing academic support activities, among others.

Oliveira Junior, Dalmau, and Souza (2022) highlight the relationship between low academic performance and deficiencies in basic education, stating that, as it is a structural issue, it is the duty of HEIs to seek ways to mitigate it. Pfeiffer, Prestes, and Santos (2023) also emphasize the connection between deficiencies in basic education and student dropout.

The integration of the student into the academic context can occur in different manners: participation in internships and research, as highlighted by Sales Junior *et al.* (2016); extension activities, which is an important way for the university to engage with the community it is part of, promoting the development of that locality; conferences, seminars, cultural activities, social projects, and other activities that foster a sense of belonging to the academic community, thereby increasing students' commitment to the course and motivation to study.

In this regard, it is noted that, in the evaluation of the antecedents of student dropout conducted by Assunção *et al.* (2023), the hypotheses were validated that engagement, clear goals, and motivation lead to student retention, and that situations that promote a sense of belonging, such as research and extension activities, are even greater incentives.

Having made these clarifications, the application of the *SIMPLES MENTE* tool is resumed, using the red and yellow cards in relation to each of the five target behaviors listed above, with the results presented in Table 1.

STRATEGIES FOR FACING THE CHALLENGE

Continuing, in order to identify possible strategies to be developed to address the issues that emerged in the previous stages, the blue cards (containing examples that better clarify the analyzed aspects) and the green cards (which contain application proposals) of the *SIMPLES MENTE* tool were applied to the identified behavioral elements (Campos Filho, 2019).

Table 1 – Mapping of behavioral insights.

SIMPLES MENTE Acronym	Behavioral Insights
Target behavior: attendance in classes	
Incentives	Is there any benefit to attending classes?
Emotion	Discouragement due to finding the class uninteresting or not understanding its relevance to their professional future may be interfering with the student's decision to attend classes.
Mental Models	Some students consider that missing class is not a problem because they can learn the content from a classmate's notebook.
Social Norms	What is the attendance rate of students with a performance above 80%? Do the other students know?
Target behavior: proactivity and consistency in studying	
Reminders and Commitments	Students may fail to maintain a regular study routine because they don't know how to organize it and are not reminded to follow through with what has been defined in this organization.
Emotion	Students may be feeling discouraged (powerless and directionless) because they are not adapted to the new teaching methodology of universities.
Mental Models	Some students believe that it is enough to study for the exam, and only the day before, not understanding the importance of assimilating the content for their professional future.
Ego	Excessive confidence from some students about their performance in assessments, leading them to not prepare adequately.
Social Norms	What is the study method of students with a performance above 80%? Do the other students know?
Target behavior: student participation in academic support/reinforcement activities	
Priming	Is there an adequate and appealing structure for carrying out these activities?
Reminders and Commitments	Students may fail to participate in academic support activities simply because they forget the date.
Emotion	Students may feel apprehensive and embarrassed about participating in these activities due to the judgment of their peers ('They will think I'm dumb, unprepared').
Salience	Is there positive and effective communication about these spaces and their importance?
Ego	Could the self-esteem of vulnerable students be affecting their participation in these activities?
Target behavior: integration of the student into the academic context	
Emotion	What could be influencing the student's sense of belonging and integration into the educational institution? Does the institution not evoke a sense of pride in them? Do they not feel the need to contribute to the academic community or not see a way to do so?
Salience	Does the student know about the events and activities promoted by the university, such as extension projects, scientific research, conferences, cultural events, etc.?
Social Norms	What is the percentage of students with a performance above 80% who engage in extension activities? Do the other students know?

Continue...

Table 1 – Continuation.

SIMPLES MENTE Acronym	Behavioral Insights
Target behavior: recognition of the student's effort and improvement in their academic performance	
Incentives	Are students receiving any benefits for their effort in improving their academic performance?
Messenger	Is the use of a possible standard recognition message (and impersonal) appropriate? What is the best wording for it? Who should make this recognition and where?
Emotion	What emotions have teachers been evoking in students when providing feedback on their academic performance?

Source: the authors (2023).

Regarding the target behavior of class attendance, considering the behavioral elements identified in the parts of incentives, emotion, mental models, and social norms of the acronym, the proposed intervention is as follows:

- a) as an incentive, offering a bonus to teachers at the beginning of the year for high student attendance, which could be reduced by the end of the year if this attendance is not maintained. This approach may be more effective than offering the bonus only at the end of the term to those who reach a certain goal, due to the greater loss aversion described by Kahneman and Tversky (1979);¹
- b) mobilizing positive emotions through communication campaigns that link attendance and participation in the classroom to increased academic performance and future professional opportunities, a proposal aligned with Vroom's (1964) expectancy theory;²
- c) as a way to break the mental model of students regarding the 'clearing' of absences by accessing material from their classmates, teachers can use engagement nudges³ to encourage in-class activities that require student presence, such as the use of audiovisual resources and small surveys conducted during lessons on topics related to the course content. Additionally, they can hold remote classes using the internet for activities that can be carried out at a distance without pedagogical loss;
- d) in the field of influence generated by social norms, publicizing elements that link attendance with the performance of students who have a grade above 80% can serve as a way to foster identification among students and encourage the desired behavior, given the concept of

1 Studies are divided with regard to the effects of paying bonuses to teachers on academic proficiency — some report positive effects on student performance (Atkinson *et al.*, 2009; Lavy, 2009; Muralidharan and Sundararaman, 2011), while others, on the contrary, do not find these effects (Glewwe, Ilias and Klemer, 2003; Goodman and Turner, 2013; Bresolin, 2014). In any case, the studies cited focus on programs that adopt the strategy of paying bonuses at the end of the term after achieving pre-established results, which is different from the proposal in this essay, of advance payment, based on the theory of greater loss aversion by Kahneman and Tversky (1979).

2 According to Vroom (1964), if a person believes they are capable of performing a task (expectancy), that this accomplishment will lead to a reward (instrumentality), and that the reward is perceived as valuable (valence), there will be greater motivation to act. En (2005), in a study analyzing motivation and academic performance of accounting students in light of expectancy theory, found results that demonstrate the validity of the motivational factors identified by Vroom to explain students' motivation to exert effort for better grades, especially when they aim to acquire knowledge useful for a superior performance at work.

3 In this regard, Blondeel, Everaert, and Opdecam (2023), in a study employing nudges to overcome procrastination, found that students who engaged more frequently with the nudges available in the virtual learning environment reported lower levels of procrastination (greater attendance and preparation for classes), which subsequently resulted in improved performance. Brown *et al.* (2023), in turn, found that the nudge intervention was successful in increasing student engagement levels in online courses.

vicarious reinforcement (learning from the consequences of others' behavior) present in social cognitive theory (Bandura, Azzi and Polydoro, 2008).

Regarding the target behavior of proactivity and consistency in studies, considering the behavioral elements identified in the parts of reminders and commitments, emotion, mental models, ego, and social norms of the acronym, the proposed intervention is as follows:

- a) sending messages/reminders to students announcing intermediate deadlines for completing partial tasks, in cases of more complex or extensive activities (O'Connell and Lang, 2017);
- b) clear and objective communication about the evaluation rules, as well as the dissemination of suggestions by the educational institution on how to achieve the goals of its new methodology, which sets an 80% academic performance score as a target for its students (Damgaard and Nielsen, 2017; Castleman and Meyer, 2020);
- c) as a way to try to break the mental model of students who study only the day before exams, distributing the total grade of the course across a greater number of assessments (assignments, exams, etc.), creating a more spaced out sequence of micro-commitments that can be fulfilled over the academic term (Felkey, Dziadula and Chiang, 2023);
- d) to counter the potential overconfidence of some students about their ability to complete the proposed activities without adequate study, through assistance or mentoring (Damgaard and Nielsen, 2017), sharing the best submissions from students in previous terms as examples of the assignments/activities/exams that will be required or applied during the academic year;
- e) regarding students' compliance with other group members, considering the aforementioned vicarious reinforcement from social cognitive theory (Bandura, Azzi and Polydoro, 2008), it is suggested to share the study methods of students with performance above 80% through personal accounts or mentoring sessions conducted by these students.

Regarding the target behavior of student participation in academic support activities, considering the behavioral elements identified in the parts of priming, reminders and commitments, emotion, salience, and ego of the acronym, the proposed intervention is as follows:

- a) providing adequate and appealing structures for carrying out these activities, given the emotional and cognitive effects that the physical environment can have on students (Rivero and Schulmeyer, 2018; Ferraz *et al.*, 2023);
- b) creating effective communication methods with students to clearly, objectively, continuously, and timely disclose the dates and academic support and assistance activities offered (Damgaard and Nielsen, 2017; Castleman and Meyer, 2020);
- c) regarding emotion and ego, considering the factor of social connection as an important psychological need for intrinsic motivation (Deci and Ryan, 1985), creating a welcoming environment for anxious or more vulnerable students by offering tutoring or mentoring activities (Silva, 2016), as well as preparatory courses for prior knowledge (Godoy and Almeida, 2017), in addition to other forms of student assistance that help them overcome potential initial barriers in knowledge or lack of material resources for adequate academic performance.

Regarding the target behavior of student integration into the academic context, considering the behavioral elements identified in the parts of emotion, salience, and social norms of the acronym, the proposed intervention is as follows:

- a) promoting campaigns that highlight the value of the educational institution and its academic community in order to awaken a sense of belonging in students (social connection as a factor

- for intrinsic motivation — Deci and Ryan, 1985) and contribute to a greater commitment to the course and motivation for studies;
- b) regarding salience, creating effective communication methods with students to clearly, objectively, continuously, and timely disclose the dates and extension activities developed by the educational institution, such as seminars, cultural activities, and social projects (Damgaard and Nielsen, 2017; Castleman and Meyer, 2020);
- c) regarding compliance with group members, encouraging students who have performance above 80% and participate in extension activities to share, through assistance or mentoring (Damgaard and Nielsen, 2017), their experiences with other students in their community.

Finally, regarding the target behavior of recognizing the student's effort and improvement in academic performance, considering the behavioral elements identified in the parts of incentives, messenger, and emotion of the acronym, the proposed intervention is as follows:

- a) regarding incentives, considering that people feel losses more strongly than equivalent gains (Kahneman and Tversky, 1979), for the portion of the grade related to student participation in class discussions and activities, offering the maximum score as a starting point, with a potential reduction throughout the term if a lack of participation or inadequate/incomplete completion of the proposed activities is observed;
- b) regarding the messenger, the institution's administration itself can send individual messages to students informing them about the historical progression of their academic performance (Smith *et al.*, 2018);
- c) in the field of emotion, positive feedback can be shared collectively, both within the class and throughout the institution, in cases of greater distinction (a factor that can contribute to increasing students' belief in their abilities to overcome challenges, according to social cognitive theory — Bandura, Azzi and Polydoro, 2008); negative feedback, on the other hand, should be given privately, with the presentation of alternatives for improvement and performance enhancement.

FINAL CONSIDERATIONS

This theoretical essay started with the issue of dropout in higher education, particularly in undergraduate programs, a complex educational phenomenon that can be triggered by a multitude of causes and has become a managerial challenge for federal universities in Brazil, aiming to stimulate reflection on the possibility that behavioral insights could be used to address this issue.

The research objectives were to explore the principles and concepts of behavioral science for a reflection on how behavioral insights can be applied to address dropout, considering the causes already identified by the literature for this phenomenon; and, from a more practical perspective, to identify, through the *SIMPLES MENTE* method, possible actions that can be implemented to improve the factor of academic performance.

In the development of this study, aspects already identified as causes of dropout among undergraduate students in higher education were presented, along with the potential behavioral issues linked to the problem, as well as some applicable theories from behavioral sciences. The *SIMPLES MENTE* tool was applied to generate suggestions for addressing the issue.

In the application of the *SIMPLES MENTE* tool, "academic performance" (identified as a key factor in the phenomenon of dropout) was chosen as the challenge to be addressed through a behavioral approach. The behavioral elements selected for the theoretical approach were: class attendance; proactivity and consistency in studying; student participation in reinforcement/academic

support activities; student integration into the academic context; and recognition of the student's effort and improvement in academic performance.

After the application of the tool, using the cards that guide the analysis of the identified behavioral elements, intervention suggestions were presented that, without being an execution command, stand out as examples of actions that can be adopted, with due adaptation, to the realities found in Brazilian universities dealing with the issue of student dropout.

As one of the limitations of this study, the choice of only one of the causes (low academic performance) among the various ones pointed out by the literature as being related to the complex phenomenon of dropout is highlighted for the application of the *SIMPLES MENTE* tool. There is a possibility that this method, as well as the other theories mentioned about behavioral sciences, could be applied to other causes of dropout that are based on behavioral problems. Furthermore, the theoretical essay was based on hypothetical causes of the potential academic performance issues of students, without access to records about the factual context of federal universities in the country.

Finally, as a proposal for future studies, it is suggested to conduct field research to deepen the analysis of the causes of dropout in higher education in Brazil and apply the tool to build new suggestions for addressing the problem, considering the scarcity of studies on the topic, acknowledged by the literature reviewed.

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