SEVEN
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EVALUATION OF THE EFFICACY OF MODULAR TEACHING IN UNDERGRADUATE STUDENTS: PERCEPTION ON MEANINGFUL LEARNING

AVALIAÇÃO DA EFICÁCIA DO ENSINO MODULAR EM ALUNOS DE GRADUAÇÃO: PERCEPÇÃO SOBRE A APRENDIZAGEM SIGNIFICATIVA

EVALUACIÓN DE LA EFICACIA DE LA ENSEÑANZA MODULAR EN ESTUDIANTES DE PREGRADO: PERCEPCIÓN SOBRE EL APRENDIZAJE SIGNIFICATIVO

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ABSTRACT
This study aimed to assess student perceptions of modular learning in an undergraduate health program. The research, approved by the Ethics Committee, used a semi-structured questionnaire administered in different modules. The results indicated that students recognize the model as organized, motivating, and meaningful, highlighting benefits such as increased engagement, content integration, and relevance to their education. However, they expressed uncertainty regarding the practical application of knowledge. It is concluded that modular learning contributes positively to learning and academic retention, provided it is combined with active methodologies and supervised practical experiences.

Keywords: Higher Education. Teaching Methods. Active Learning. Meaningful Learning. Motivation. Health Education.

RESUMO
Este estudo teve como finalidade avaliar a percepção discente sobre o ensino modular em um curso de graduação em saúde. A pesquisa, aprovada pelo Comitê de Ética, utilizou questionário semiestruturado aplicado em diferentes módulos. Os resultados indicaram que os estudantes reconhecem o modelo como organizado, motivador e significativo, destacando benefícios como maior engajamento, integração de conteúdos e relevância para a formação. Contudo, apontaram insegurança quanto à aplicação prática dos conhecimentos. Conclui-se que o ensino modular contribui positivamente para a aprendizagem e permanência acadêmica, desde que articulado a metodologias ativas e experiências práticas supervisionadas.

Palavras-chave: Educação Superior. Métodos de Ensino. Aprendizagem Ativa. Aprendizagem Significativa. Motivação. Educação em Saúde.

RESUMEN
Este estudio tuvo como objetivo evaluar la percepción de los estudiantes sobre el aprendizaje modular en un programa de salud de pregrado. La investigación, aprobada por el Comité de Ética, utilizó un cuestionario semiestructurado administrado en diferentes módulos. Los

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resultados indicaron que los estudiantes reconocen el modelo como organizado, motivador y significativo, destacando beneficios como mayor participación, integración de contenidos y relevancia para su formación. Sin embargo, expresaron incertidumbre respecto a la aplicación práctica de los conocimientos. Se concluye que el aprendizaje modular contribuye positivamente al aprendizaje y la retención académica, siempre que se combine con metodologías activas y experiencias prácticas supervisadas.

Palabras clave: Educación Superior. Métodos de Enseñanza. Aprendizaje Activo. Aprendizaje Significativo. Motivación. Educación para la Salud.

1 INTRODUCTION

The modular teaching model has been a growing alternative in higher education, seeking to promote a more structured and integrated organization of academic content. In the Collective Health course at Forma Pará, this model allows students to have access to teaching that prioritizes interdisciplinarity and reflective practice. However, students' perception of the effectiveness of this model in promoting meaningful learning is still little explored, especially in comparison with active methodologies, which have proven effective in various educational contexts (Lacerda et al., 2018).

The lack of personalization of teaching can result in demotivation and disengagement on the part of students, leading to a passive, ineffective learning experience with a greater prospect of dropout. This cycle of disinterest can not only compromise academic success but also students' emotional health, fueling an environment prone to dropout. Thus, it is urgent to explore not only more effective teaching methods, but also to understand the intersection between education and psychological well-being, seeking a holistic approach that promotes engaging and healthy learning (Zanoni; Venturi; Sousa, 2022).

One of the great challenges today for higher education in Brazil is the minimization of the dropout rate, as there is a high investment in the maintenance of public courses, funded by society, and many of them with a scarce number of students enrolled. On the other hand, the eagerness of young people to enter public higher education and the complexity of maintaining themselves until the end of the chosen course (Belasco et al., 2018) can be perceived.

Another important point that deserves attention from education scholars is how teaching methodologies and techniques reflect on the psychological well-being of university students. The university is a time of transition and adaptation that imposes persistent demands, pressure for academic performance, multiplicity of tasks, and responsibilities (Arino et al., 2018). These and other factors characteristic of this period may be related to the high prevalence of mental illness in the university public (Leão et al., 2018).

Education must be able to stimulate a vision of the whole - of interdependence and transdisciplinarity - in addition to providing the construction of networks of social change, with the consequent expansion of individual and collective consciousness. Thus, one of its competencies lies precisely in the increase in the tendency to search for innovative methods, which admit an ethical, critical, reflective and transformative pedagogical practice,

transcending the limits of purely technical training, to effectively achieve the formation of man as a historical being, inscribed in the dialectic of action-reflection-action (Mitre et al., 2008).

The lack of understanding about the effectiveness of modular teaching, combined with the limited use of innovative methodologies, can compromise the quality of learning. This study seeks to investigate how Forma Pará Collective Health students perceive learning in the modular context, analyzing the effectiveness of different pedagogical approaches in the teaching-learning process.

2 MATERIAL AND METHODS

The project was submitted to the Center for Biological and Health Sciences Committee – CCBS (Campus II), which obtained an approval opinion under number 7432.062. The data collected during the research were treated confidentially. Identity and personal information were anonymized, ensuring that no individual information was linked to the data obtained. Participants were informed about the benefits and risks of the research, including minimal risks of data leakage or embarrassment when answering questionnaires related to psychological aspects.

The present study had an informed consent form, in which participants who were interested in participating signed to ensure their inclusion in the study. It was essential to ensure that all participants fully understood the objectives, procedures, risks and benefits before agreeing to participate. In this sense, informed consent was obtained voluntarily, allowing the participant the freedom to withdraw their consent at any time without suffering any penalty.

The research was carried out in the municipalities of Capanema and São João da Ponta, located in the State of Pará, with students from the Collective Health course at the State University of Pará (UEPA). The sample size was calculated based on the sample calculation formula for descriptive studies, considering a confidence interval of 95% and sampling error of 5%. The application of the instrument took place at the end of the module.

Students who, for any reason, could not guarantee full participation in all scheduled activities, in order to ensure consistency and integrity of the data collected, were excluded.

A semi-structured questionnaire was applied to investigate the students' perception of learning. The instrument used was composed of different types of questions, ranging from demographic aspects to more detailed questions about the students' perception of modular teaching.

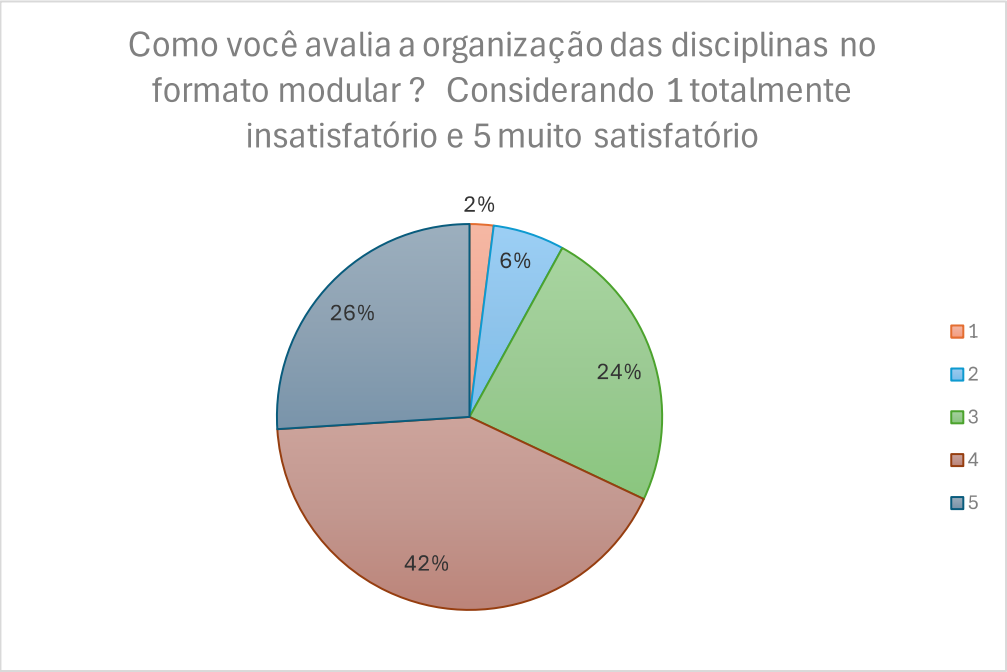
3 RESULTS AND DISCUSSION

Based on the application of fifty questionnaires to students of the Collective Health course at the State University of Pará, it was possible to draw a detailed overview of the perceptions about modular teaching. The sample was mostly female (90%) and concentrated in the sixth semester (100%).

Figure 1 shows the students' evaluation of the organization of the disciplines in the modular format, on a scale from 1 (totally unsatisfactory) to 5 (very satisfactory). There is a predominance of favorable perceptions, with 68% of the students classifying the experience as satisfactory or very satisfactory.

Figure 1

Evaluation of the organization of the disciplines



Source: Prepared by the authors, 2025.

The predominance of positive evaluations suggests that the modular structure was perceived by the students as an arrangement capable of favoring the organization of the contents and the conduction of the teaching-learning process. These findings are close to studies that show the perception of graduates about the Modular Teaching Organization System (SOME) in Pará, which recognize advances related to organization and access, but also point to challenges in infrastructure and pedagogical support (RODRIGUES; SILVA, 2018; ALVES; ALMEIDA, 2015).

However, the presence of median evaluations and a small group of unsatisfactory answers indicates that the student experience was not homogeneous. Recent research highlights that the effectiveness of modular teaching depends on clarity in pedagogical planning and institutional capacity to promote integration between contents (CHAGAS, 2022; RAMALHO; OLIVEIRA, 2024).

When evaluated to the question of whether modular teaching facilitates the integrated understanding of the contents covered; It is observed that 60% of the participants answered affirmatively, while 26% stated "maybe" and only 14% considered that the modular format does not contribute to this integration.

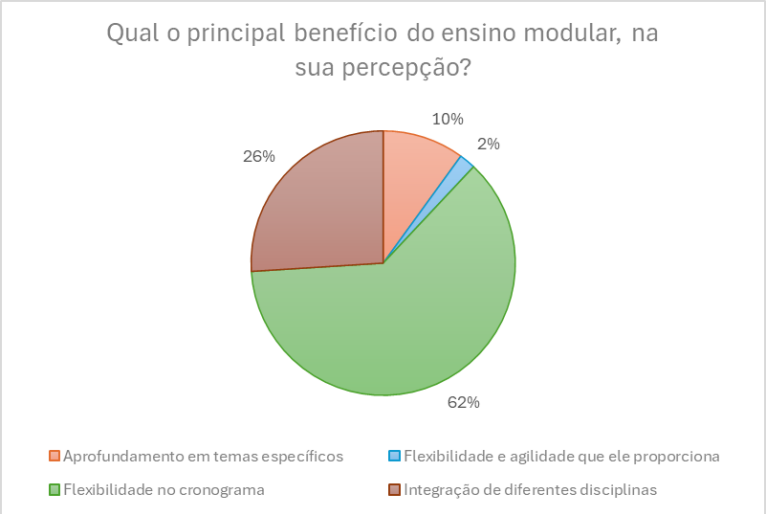
The predominance of positive responses suggests that modular teaching was perceived as a pedagogical arrangement capable of favoring the integration between different curricular components. This result is in line with studies that discuss interdisciplinarity and the articulation of knowledge in SOME and in modular models, emphasizing that the proposal has the potential to expand the coherence of the training process (RODRIGUES; SILVA, 2018; RAMALHO; OLIVEIRA, 2024).

On the other hand, the proportion of uncertain and negative answers indicates that not all students experienced this integration in a full way. As discussed by Alves and Almeida (2015), modularity can both contribute to the articulation of content and, in some contexts, generate fragmentation, if there is no alignment between teachers and curricular clarity. Chagas (2022) also highlights that the consolidation of modular teaching depends heavily on institutional planning and continuing education of teachers.

The majority of participants (62%) highlighted the flexibility in the schedule as the biggest differential of this format. Next, 26% pointed to the integration of different disciplines, while 10% indicated the deepening of specific topics. Only 2% identified the flexibility and agility provided by the model as a central benefit. (Figure 2).

Figure 2

Students' perception of the benefit of modular teaching



Source: Prepared by the authors, 2025.

The emphasis attributed to flexibility in the schedule corroborates findings in the literature on SOME, in which temporal flexibility is frequently mentioned as one of the main attractions of the model, especially in regions of difficult access (ALVES; ALMEIDA, 2015; RODRIGUES; SILVA, 2018). This characteristic favors adaptation to local realities and contributes to the permanence of students.

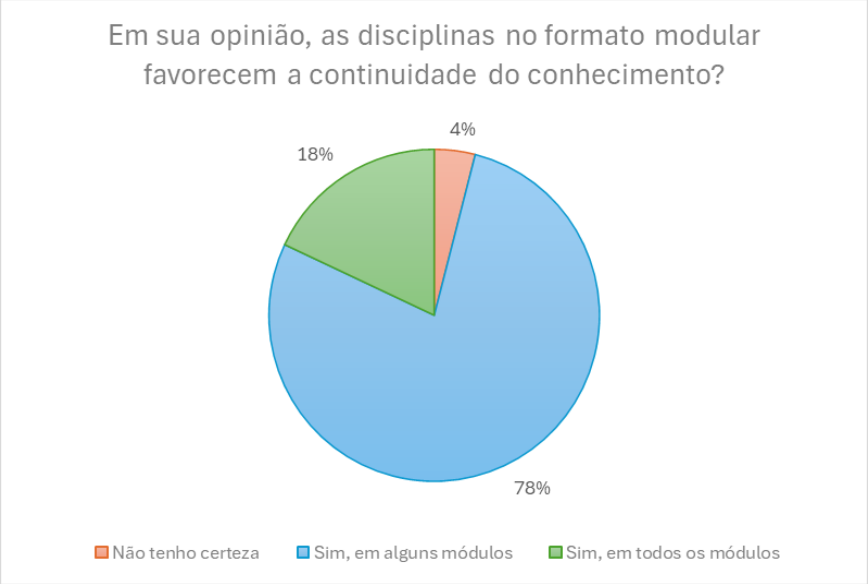
The integration of different disciplines, mentioned by 26% of the participants, reinforces recent analyses that point to the potential of modular teaching to promote interdisciplinarity, bringing academic content closer to practical and community needs (CHAGAS, 2022; RAMALHO; OLIVEIRA, 2024).

The lesser emphasis on the deepening of specific topics and agility reveals limitations of the model. According to Rodrigues and Silva (2018), although SOME allows access and differentiated organization, the overload of content and the lack of time for deepening can compromise the pedagogical experience.

Figure 3 shows the students' perception of the disciplines in the modular format that favor the continuity of knowledge. The majority (78%) answered that the format promotes continuity in some modules, while 18% stated that this continuity occurs in all modules. Only 4% declared that they were not sure about this aspect.

Figure 3

Students' perception of the disciplines in the modular format



Source: Prepared by the authors, 2025.

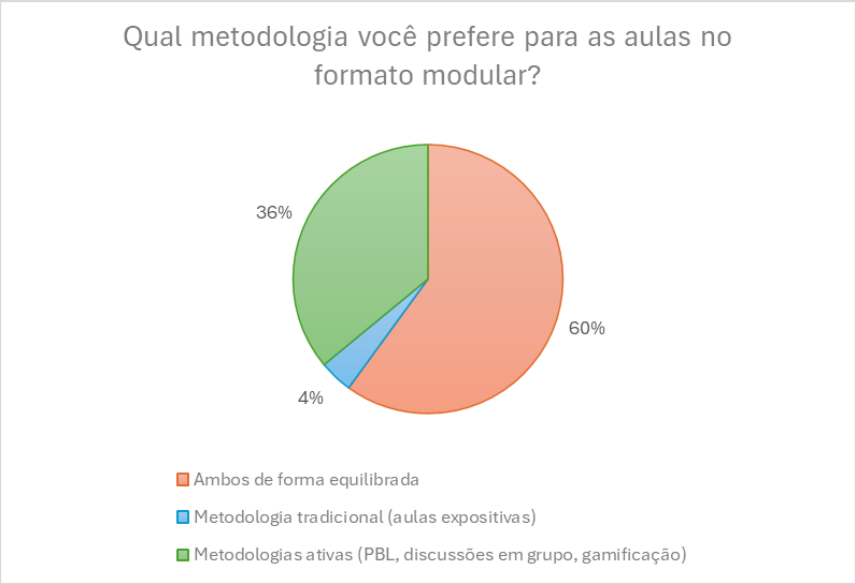
The findings show that, in the perception of the students, the modular format has the potential to ensure continuity of knowledge, even though this perception is not uniform in all modules. Studies on the Modular Teaching Organization System (SOME) in Pará identify a similar phenomenon: although the proposal favors greater curricular organization and access to distant communities, difficulties persist related to the articulation between the modules and the standardization of pedagogical quality (RODRIGUES; SILVA, 2018; ALVES; ALMEIDA, 2015).

The fact that only 18% of the participants perceived continuity in all modules suggests that the effectiveness of modularity depends strongly on pedagogical planning and integration among teachers. Chagas (2022) points out that failures in coordination and teacher training can generate fragmentation and compromise the progression of knowledge throughout the modules. Similarly, Ramalho and Oliveira (2024) argue that, in some contexts, modularity ends up being experienced in a discontinuous way, which can affect both students' motivation and learning.

Figure 4 shows the students' preference in relation to the methodologies used in modular teaching. The majority (60%) said they prefer a balanced combination between traditional and active methodologies. Next, 36% showed an exclusive preference for active methodologies, such as Problem-Based Learning (PBL), group discussions and gamification. Only 4% indicated a preference for traditional methodologies (lectures).

Figure 4

Students' preference in relation to the adopted methodology



Source: Prepared by the authors, 2025.

The preference for a balanced combination of methodologies suggests that students recognize the value of traditional lectures, but at the same time demand active strategies that favor participation and autonomy. This finding is in line with research that points to the need for methodological hybridization in higher education, in order to contemplate different learning styles and maximize pedagogical effectiveness (BERBEL, 2011; BORGES; ALMEIDA; PEREIRA, 2020).

The fact that 36% of students opt exclusively for active methodologies confirms the growing relevance of these strategies, which have been widely discussed in the literature as effective means to promote engagement, critical thinking and meaningful learning (MITRE et al., 2008; CYRINO; TORALLES-PEREIRA, 2004). Experiences with PBL, collaborative discussions, and gamification have shown positive impacts on student motivation and knowledge retention in courses in the area of health and applied social sciences.

On the other hand, the low adherence to exclusively traditional methodologies (4%) indicates that students perceive limitations in lectures as a central strategy. Recent studies indicate that, although important for the structured transmission of content, when used in isolation, such methodologies tend to reduce student engagement and autonomy (BORGES; ALMEIDA; PEREIRA, 2020).

When assessing the students' perception of engagement and motivation during classes that use active methodologies, it was detected that the vast majority (86%) stated

that they felt more engaged and motivated in these classes, 10% were not sure, and 4% stated that they were no longer engaged.

The results show that active methodologies were perceived by students as high-impact tools for promoting engagement in the teaching-learning process. The literature corroborates this finding: Mitre et al. (2008) point out that strategies such as problem-based learning, problematization and participatory methodologies favor autonomy, intrinsic motivation and the collective construction of knowledge.

Similarly, Berbel (2011) highlights that active methodologies stimulate the student's protagonism, leading him to assume an active role in the search, analysis and application of knowledge. Borges, Almeida and Pereira (2020) reinforce that the incorporation of these practices in higher education expands interaction, improves content retention and strengthens criticality.

The low proportion of negative responses (4%) may be associated with difficulties in adapting to the new format or individual preference for more structured lectures. Cyrino and Toralles-Pereira (2004) emphasize that the successful implementation of active methodologies depends on consistent pedagogical planning and teacher preparation, in order to avoid frustration or disorganization in the teaching process.

Regarding the students' self-assessment of their participation in classes that use active methodologies. Most (48%) evaluated their participation with a score of 4, followed by 24% who gave a score of 5, indicating high levels of involvement. Another 20% were intermediate (grade 3), while only 6% and 2% assigned grades 2 and 1, respectively.

The results point to a predominantly positive perception of student participation in active methodologies, suggesting that such strategies promote greater involvement in the teaching-learning process. Studies corroborate this finding: Mitre et al. (2008) highlight that methodologies such as Problem-Based Learning (PBL) and problematization favor not only motivation, but also the active participation of students in the construction of knowledge.

Similarly, Berbel (2011) points out that the adoption of active methodologies contributes to student protagonism and meaningful learning, since it shifts the focus from the transmission of content to critical and collaborative participation. Borges, Almeida and Pereira (2020) reinforce that the perception of greater engagement is directly associated with teaching practices that combine challenges, collaboration and reflection.

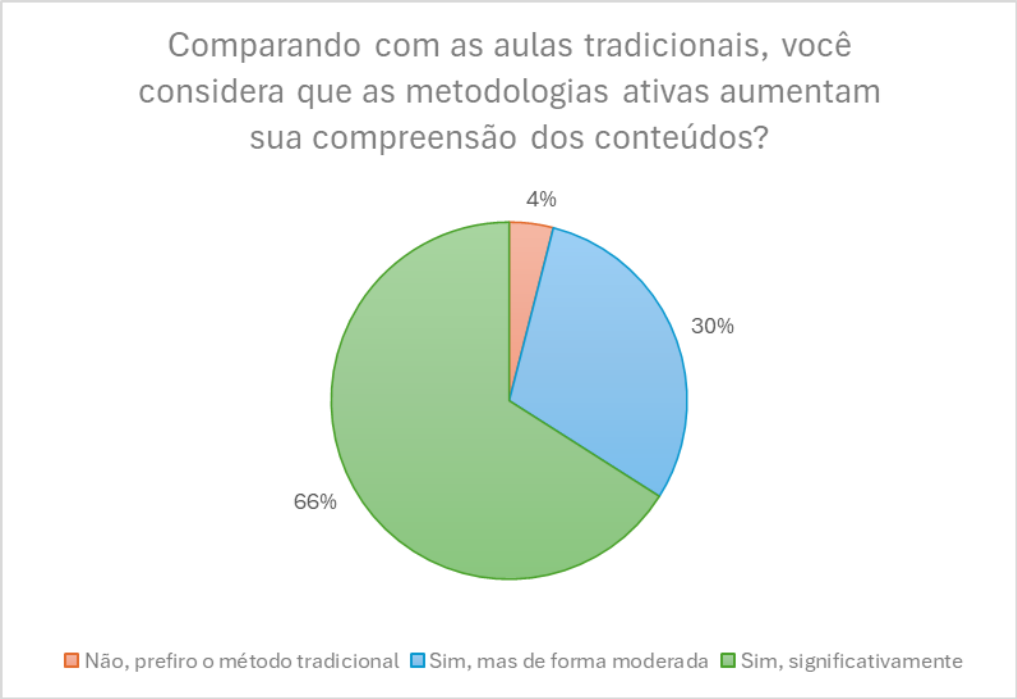
The small portion of students who self-assessed with low levels of participation (grades 1 and 2) may indicate individual difficulties in adaptation, preference for traditional

methodologies or deficiencies in the teaching conduct of activities. Cyrino and Toralles-Pereira (2004) emphasize that the effective implementation of active methodologies requires consistent pedagogical preparation and close monitoring of students so that everyone can engage in an equitable manner.

Figure 5 shows the students' perception of the impact of active methodologies on the understanding of the contents compared to traditional classes. The majority (66%) stated that active methodologies significantly increase understanding. Another 30% considered that they improve comprehension, but in a moderate way. Only 4% declared a preference for the traditional method.

Figure 5

Comparison between active and traditional methodologies in the understanding of content



Source: Prepared by the authors, 2025.

The results show a clear appreciation of active methodologies in relation to traditional teaching, especially due to the perception that they promote greater understanding of the contents. Recent studies corroborate this trend: Pereira et al. (2019) demonstrated that active methodologies favor meaningful learning by stimulating student protagonism and the contextualization of content.

Similarly, Araújo et al. (2020) identified that practices such as Problem-Based Learning and collaborative learning increase students' ability to apply knowledge in practical situations,

in contrast to the expository approach, which tends to be limited to memorization. Furthermore, Lima et al. (2021) point out that the integration of active methodologies in higher education contributes not only to a better conceptual understanding, but also to the development of critical and collaborative skills, essential to academic and professional training.

The small portion that expressed a preference for traditional education (4%) may reflect greater familiarity with this model or difficulties in adapting to innovative practices. Studies indicate that the implementation of active methodologies requires teacher preparation, adequate infrastructure and time for planning, at the risk of compromising their effectiveness (SILVA; SAINTS; SILVEIRA, 2020).

When the motivation to learn in the modular disciplines was evaluated, the majority (50%) evaluated their motivation with a score of 4 (high level), while 26% gave a score of 5 (maximum level). On the other hand, 24% gave a score of 3, indicating an intermediate motivation.

Modular organization can favor greater student engagement by allowing concentration on specific content in shorter and more intensive periods (SILVA et al., 2021). In addition, methodologies that accompany the modular format, such as active learning and interdisciplinary integration, have been associated with increased student motivation and autonomy (FREITAS et al., 2020).

However, the proportion of students who remain at an intermediate level of motivation (24%) indicates that the modular format, by itself, does not guarantee full engagement. As Pires and Macedo (2022) point out, motivation in higher education is strongly linked to the combination of pedagogical methods and institutional support, including infrastructure conditions and clarity in training objectives.

Recent studies also emphasize that academic motivation is intrinsically related to the student's role in the learning process. Research by Costa et al. (2021) showed that students exposed to environments that encourage active participation, such as modular teaching associated with innovative methodologies, report greater interest, persistence, and perception of the usefulness of the content.

When analyzing the contribution of modular teaching to the interest in remaining in the course, the majority (48%) gave a score of 5, indicating that the model strongly contributes to academic permanence. Another 28% evaluated it with a score of 4, reinforcing a relevant

contribution, although slightly lower. On the other hand, 24% gave it a score of 3, revealing an intermediate perception of this impact.

The results are in line with the literature that points to modular teaching as a factor of student retention, as it facilitates the organization of learning in clearer and more objective stages (SANTOS; FIALHO, 2019). This format can contribute to reducing dropout, as it allows students to better visualize their progression in the course and achieve results in shorter cycles (FERNANDES et al., 2021).

In addition, recent research highlights that academic permanence is associated not only with the curricular structure, but also with the perception of belonging and engagement that the educational model offers (MOURA; RIBEIRO, 2022). In the case of modular teaching, the integration of content and the practical applicability of knowledge strengthen the intrinsic motivation of students, favoring their continuity in the courses.

However, the portion of 24% who showed intermediate perception reinforces that modular teaching is not an isolated factor in the decision to stay. Aspects such as infrastructure, pedagogical support, and methodological strategies also play a fundamental role, as highlighted by Lima and Barbosa (2020) in a study on permanence in higher education.

The majority (54%) answered that the model partially enables the development of autonomy, while 42% believe that modular teaching directly favors this competence. On the other hand, only 2% said they did not perceive this benefit, and another 2% reported uncertainty.

Autonomy is one of the pillars of learning in higher education, being strongly related to engagement and the development of critical skills (MORAN, 2018). The modular model, by organizing content in shorter and more concentrated blocks, favors the student's responsibility for the training process itself, stimulating greater protagonism (SILVA; LEE; BARBOSA, 2020).

The results obtained in this research are in line with studies that indicate that methodologies organized in modules can facilitate the self-regulation of learning, allowing students to identify short-term goals and monitor their evolution (MARTINS; ALMEIDA, 2021). However, the perception that autonomy occurs only "partially" (54%) may be associated with the fact that many courses still maintain teacher-centered practices, reducing opportunities for decision-making by the student (GOMES; CARVALHO, 2019).

Student autonomy is enhanced when modular teaching is combined with active methodologies, such as problem-based learning (PBL) and projects (MENDES; SILVA; CRUZ, 2022). Thus, the modular model, by itself, represents a favorable structure, but its effectiveness in promoting autonomy depends on participatory pedagogical practices that encourage the student to take an active role in the construction of knowledge.

When assessing the perception of the practical application of the knowledge acquired in the modules, it was observed that the majority (66%) stated that they felt prepared, although with some doubts. A relevant percentage (22%) stated that they felt fully prepared, showing confidence in modular teaching. On the other hand, 10% of the students reported insecurity in applying the contents, while 2% said they were not sure.

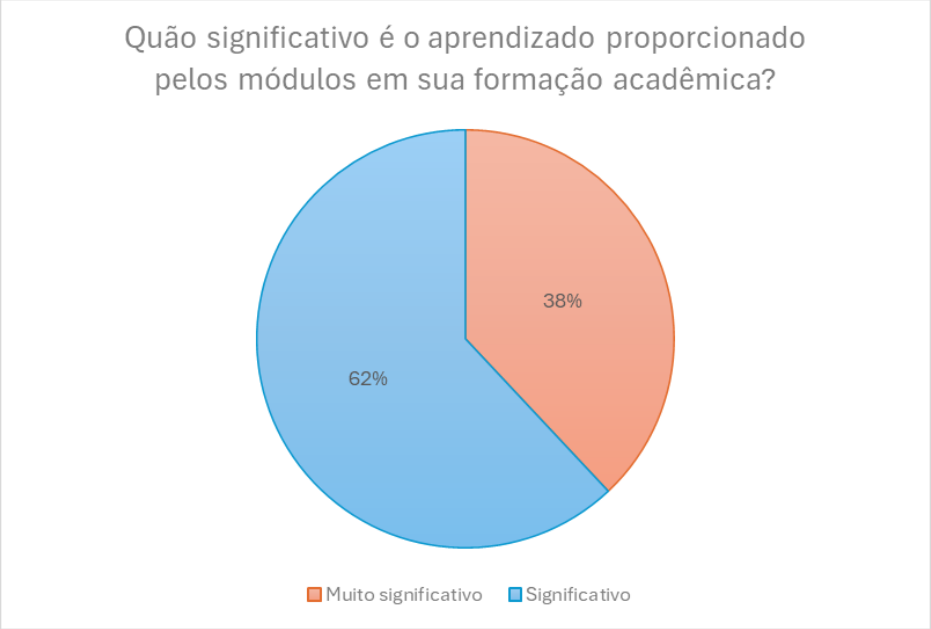
The practical application of knowledge is one of the main objectives of higher education in health, and is strongly associated with the integration between theory and practice (FREITAS; CUNHA, 2021). The results obtained reveal that, even in a modular model, most students still have doubts about their effective preparation, which indicates the need for pedagogical strategies that strengthen practical experience from the initial periods of training.

Recent studies have pointed out that active methodologies, when associated with modular teaching, enhance meaningful learning, favoring the student's confidence to apply the content in real contexts (FREITAS et al., 2020; CAVALCANTE; SILVA; ANDRADE, 2019). However, research also indicates that the perception of insecurity may be related to low exposure to supervised practice scenarios, which limits the transposition of theoretical knowledge into practice (MELO; CRUZ, 2022).

Figure 6 shows the students' perception of the degree of significance of the learning provided by modular teaching. The majority of students (62%) rated this learning as significant, while 38% rated it as very significant. There were no records of negative or neutral responses, which demonstrates unanimity in valuing the formative experience within the modular model.

Figure 6

Significance of the learning provided by the modules in academic training



Source: Prepared by the authors, 2025.

The predominance of positive responses reinforces the potential of modular teaching to promote meaningful learning, a concept described by Ausubel and widely applied to higher education in health, in which the integration of new knowledge into pre-existing cognitive structures expands understanding and practical applicability (MOREIRA, 2019).

Similar results were observed by Silva et al. (2021), in a study with nursing students, in which modular teaching associated with active methodologies was perceived as facilitating knowledge retention and academic autonomy. This perception was also reported by Oliveira and Rodrigues (2020), who highlight that the modular organization, by presenting content in structured and interconnected blocks, contributes to greater engagement and perception of usefulness in the training process.

Students who attribute greater significance to the learning process tend to have greater intrinsic motivation and better academic performance, strengthening permanence and reducing dropout rates (SOUZA; SAINTS; ANDRADE, 2022). In this sense, the data obtained indicate that modular teaching not only organizes the curriculum, but also plays an important role in the subjective valorization of the educational process.

Most respondents (74%) reported that the modular format sometimes contributes to the practical application of knowledge, while only 26% stated that this always occurs.

The findings suggest that students recognize the potential of modular teaching to favor practice, but do not perceive it as a continuous guarantee. This perception is consistent with the literature, which points out that the effectiveness of the modular model is related to the way it is articulated with active teaching methodologies and experiences in real scenarios (OLIVEIRA et al., 2020; GATES; CARVALHO, 2021).

Practical application is maximized when modules include simulation activities, supervised internships, and teaching-service-community integration (COSTA; FILE; MOURA, 2022). However, when modular teaching is limited to theoretical transmission, the perception of applicability can be reduced, resulting in fragmented learning experiences (SILVA; SOUZA; PEREIRA, 2019).

Thus, the data of this research reinforce that modular teaching, in order to reach its full potential, needs to be associated with pedagogical strategies that connect theory and practice in a systematic way, strengthening professional training and student self-confidence.

4 CONCLUSION

The results of this research show that modular teaching has significant potential to favor learning in higher education in health, especially when associated with active methodologies. The analysis of the data revealed that most students perceive the format as organized, motivating and relevant to their academic training, attributing it a strong impact on engagement, intrinsic motivation and the significance of learning.

However, it was observed that the students' perception of the practical application of the acquired knowledge is ambivalent: although a considerable part of the students feel prepared to act in real contexts, many still report insecurity or partial understanding of the practical applicability. This limitation indicates that the modular model, by itself, does not guarantee the full development of student autonomy and self-confidence, and it is necessary to strengthen the integration between theory and practice, through simulations, supervised internships and greater articulation with the service and the community.

In addition, the perception that modular teaching contributes to continuity and permanence in the course reinforces its relevance not only in the curricular organization, but also as a strategy for reducing dropout and strengthening the student's bond with the training process.

Therefore, it is concluded that modular teaching is an effective pedagogical tool valued by students, but that its maximum effectiveness depends on the adoption of active

methodologies and integrative practices, capable of transforming the curricular structure into a space for meaningful, critical learning applicable to the professional reality.

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