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Student self-perception of learning using active methodologies in a hybrid course on physiotherapeutic expertise

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Abstract: The objective of this study was to evaluate students' self-perception of learning using active methodologies in a hybrid course on physiotherapy expertise. Using questionnaires, this study analyzed sociodemographic characteristics, experience with digital technologies, satisfaction with classes and self-perception of learning. It concludes that the use of active methodologies contributed to students' learning and can be an adjuvant in teaching aiming its qualification.

Keywords: students learning; active methodologies; hybrid course.

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Autopercepção de aprendizagem discente pelo uso de metodologias ativas em curso híbrido sobre perícia fisioterapêutica

Resumo: O objetivo deste estudo foi avaliar a autopercepção de aprendizagem discente pelo uso de metodologias ativas em curso híbrido sobre perícia fisioterapêutica. Por meio de questionários, o estudo avaliou características sociodemográficas, experiência com tecnologias digitais, satisfação com as aulas e autopercepção de aprendizado. Conclui que o uso de metodologias ativas contribuiu para o aprendizado discente, podendo ser um adjuvante no ensino visando à sua qualificação.

Palavras-chave: aprendizagem discente; metodologias ativas; curso híbrido.

Autopercepción del aprendizaje del alumno mediante el uso de metodologías activas en un curso híbrido de experiencia fisioterapéutica

Resumen: El objetivo de este estudio fue evaluar la autopercepción del aprendizaje de los estudiantes mediante el uso de metodologías activas en un curso híbrido de especialización en fisioterapia. Mediante cuestionarios se evaluaron características sociodemográficas, experiencia con tecnologías digitales, satisfacción con las clases y autopercepción del aprendizaje. Se concluye que el uso de metodologías activas contribuyó al aprendizaje de los estudiantes y podría ser un complemento a la enseñanza orientada a su cualificación.

Palabras clave: Enseñanza-Aprendizaje; Metodologías Activas; Educación Híbrida.

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1 INTRODUCTION

In addition to undergraduate education in the healthcare field, it is important that students also qualify their professional training through extracurricular courses (Da Veiga et al., 2019), and one of the contemporary ways in which teachers can instruct is through the use of digital technologies (Pedra, 2021). The integration of software featuring images and animations, alongside the use of virtual learning environments (VLEs), allows faculty to employ methodological strategies that facilitate knowledge construction (Fabrin et al., 2014). Thus, digital technologies are viewed as indispensable tools, facilitating connection among students, teachers, and institutions (Da Costa et al., 2024), enabling many extracurricular healthcare courses to take place in a hybrid format. This teaching modality consists of combining in-person and distance activities using digital technologies, offering advantages such as learning flexibility and the possibility of integrating different methodologies (Zukowsky-Tavares et al., 2023).

Physical Therapy expertise aims to evaluate the functional and biomechanical conditions of individuals in judicial or administrative contexts (Lucas, 2009) and is a technical subfield that is not included in the curriculum of all Brazilian Physical Therapy programs (Lehm; Schmidt, 2023). Thus, an extracurricular course on this topic becomes valuable for the education of these professionals (Guimarães et al., 2023).

How can an extracurricular course be made attractive to students? Undoubtedly, there are many alternatives, but the use of active methodologies combined with digital technologies can be one of them. Active methodologies are educational approaches that can promote a critical and reflective teaching-learning process, as well as increase student engagement and motivation, encouraging them to become active agents in building their own knowledge (Morán, 2015). Guimarães et al. (2021) point out that they can be valuable tools for learning when combined with expository and dialogic lectures, if they are applied within a context connected to professional reality. Thus, it is also necessary to address theoretical-scientific knowledge regarding pedagogical problems to assist students in developing concepts that serve as mental tools to deal with society's problems and dilemmas (Libâneo et al., 2022; Rubtsov, 1996).

Hybrid education is part of the 21st century as a teaching-learning model that combines the

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best practices of in-person and Distance Education (DE) modes in higher education and, when associated with active methodologies, has favored learning (De Oliveira et al., 2021). Fidler and Prestes (2024) conducted research on students' self-perception regarding the benefits of using active methodologies in hybrid education. In their findings, they identified higher engagement, active participation, and deeper knowledge acquisition according to student opinions, which indicates that these strategies can be explored to maximize teaching in this modality.

According to Sekuler, Watamaniuk, and Blake (2002), perception is a process that involves the organization and interpretation of sensory stimuli, allowing for the recognition of objects and events. One of the essential elements of perception is self-perception, which encompasses how individuals perceive their attitudes and beliefs based on their behavior. Salvador (1994) defines it as a set of qualities, limitations, and characteristics that individuals recognize in themselves; therefore, it is an internal factor that can facilitate or hinder learning, impacting educational goals (Tonelotto; Gonçalves, 2002). Understanding students' perceptions regarding the use of active methodologies adopted in the teaching-learning process within a hybrid modality provides elements to support improvements in teaching quality. Consequently, the objective of this study is to evaluate students' self-perception of learning using active methodologies in a hybrid course on physical therapy expertise.

2 MATERIALS AND METHODS

This is a cross-sectional study with a quantitative-qualitative approach. Following the project's approval by the Research Ethics Committee (CEP) of the Federal University of Health Sciences of Porto Alegre (UFCSPA) (CAAE 68850423.2.0000.5345), the Physical Therapy program at the institution was contacted via email to present the study to be developed. With institutional consent, the course offering was advertised on social media and in UFCSPA Physical Therapy WhatsApp groups. Hence, the extracurricular hybrid course titled “Introduction to Physical Therapy Expertise” was launched and took place between October and December 2023. The in-person sessions were held at UFCSPA, and the distance sessions were conducted in a synchronous format via Google Meet, along with asynchronous activities on Moodle (the VLE provided by the higher education institution).

The extracurricular course consisted of 12 meetings, divided into modules (7 online classes and 5 in-person classes), planned to address the main concepts on the topic, starting from the

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theoretical knowledge that students were expected to achieve by the end of each class. Therefore, all classes were divided into two parts: they began with an expository-dialogic class in which the theoretical content was addressed, and subsequently, different active methodologies were applied so that students could perceive whether they had understood the material covered, discuss it, reflect on it, and resolve questions. As active methodologies, the following were used, in order (from the first to the twelfth class):

- Peer instruction (Mazur, 2015): five questions involving the practice of physical therapy professionals in the forensic field were presented. Students organized themselves into trios and discussed each question provided by the teacher for five minutes. Analysis of the answers showed a correct response rate exceeded 70%; therefore, the instructor briefly commented on the subject and moved forward with the content;

- Flipped classroom (Bollela, 2017): a technical discussion was conducted in a forum with a guiding question on the topic in Moodle. Additional reading material was also made available in the form of scientific articles and technical texts;

- Charles Maguerez Arch (Berbel, 2012): allows interaction between student and teacher, enabling the (re)construction of concepts and sharing of everyday perceptions. Following the theoretical explanation, the teacher asked questions, and each student had to answer them individually and live;

- Serious game (Limeira et al., 2015): participants were divided into two groups, and questions were asked via Kahoot (a learning platform that uses game dynamics and quizzes). Students discussed the questions in pairs to reach a consensus and marked their chosen option on Kahoot using their internet-connected mobile devices (Castilho; Haydu, 2024). Subsequently, the teacher provided feedback, creating space for discussion on the concepts studied;

- Jigsaw puzzle (Monteiro, 2024): an authorial virtual puzzle, titled “Physical Therapy Expertise Jigsaw Puzzle,” on the topic (in PowerPoint format), developed by the teacher and made available to students through Moodle. Participants were divided into pairs, and each pair was required to upload the completed puzzle file to Moodle. Students received an expert report that served as the basis for gameplay. Participants had 15 minutes to read this material

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and execute the game. Subsequently, the teacher demonstrated how the puzzle should have been assembled and opened space to resolve questions;

- Discussion cycle and problem-solving via forum in Moodle (Lucas, 2024): students were challenged to build a word cloud, which is a visual representation of word frequency in a text (Franco et al., 2024). For this purpose, the Mentimeter application (a platform that allows the creation of interactive presentations) was used (Franco et al., 2024). After this construction, an open discussion with the whole group was fostered through a discussion and problem cycle, an educational strategy in which participants face challenges in groups and that operates through (I) problem identification, (II) group discussion, and (III) identification of unclear points (Lucas, 2024);

- Board game (Monteiro, 2024): an authorial board game titled "Ergonomics Race" presented to students in printed format. The class was divided into groups of 3 to 4 participants, and the game rules were explained by the teacher. Match durations ranged between 10 and 15 minutes, depending on the dialogue and decisions made by each player, as well as factors of luck and setback in acquiring cards that facilitated or hindered their moves, enabling students to understand the consequences of their decisions regarding the theme. Following this, a large-group discussion began;

- Mind maps (Franco et al., 2024; Queiroz et al., 2023): participants were divided into pairs or trios and received randomly assigned topics related to the class. Then, they developed a virtual mind map highlighting the main ergonomic risk factors and aspects that can lead to human impairment and disabilities in these patients. The maps were published on MindMeister, which is an online platform that facilitates the creation of collaborative mind maps, allowing users to capture, organize, and share ideas with their teams in a fast and intuitive manner (Nitchot; Gilbert, 2025). Students were asked to create a presentation, followed by a discussion of the elaborated map with the large group;

- Constructivist spiral (Xavier, 2023): promotes the construction of knowledge in a continuous and interactive way and functions through problematization, formulation of explanations, development of questions related to the study problem, and knowledge building through interaction and reflection, forming a continuous learning spiral. In class,

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the teacher presented a case, which was developed verbally to foster reflection and discussion among all actors;

- Role-playing (Souza et al., 2023): students were divided into groups and challenged to organize a simulation of an expert examination chosen by the teacher, simulating professional situations, with a 30-minute planning time inside the classroom, to be presented in 5 to 10 minutes to the class. Afterwards, a discussion was held with the large group regarding the dramatized case, clarifying doubts;

- Virtual walls (Biella et al., 2024): the teacher distributed printed examples of expert reports to the students, who were divided into groups, so that they could observe how the expert document is drafted and structured. Participants used notebooks/tablets to build a virtual wall (on Padlet – a platform that allows the creation of virtual boards to organize information, functioning as a digital bulletin board where users can add text, images, videos, and links, facilitating collaboration and the organization of ideas) so that students could learn, reflect, interact, and form their concepts. On this virtual wall, each group developed a proposal for an expert evaluation for a specific lawsuit assigned by the teacher. Subsequently, the groups posted their work on the course Moodle page to interact with the posts of other groups, commenting in person on the activities, assessing whether there was understanding or possible misunderstandings, with immediate feedback;

- Discussion circle (Leopoldino et al., 2023): allows collective resonance in the construction and reconstruction of concepts and arguments based on listening and dialogue. The teacher presented cases experienced in professional practice regarding document writing; thereafter, students were divided into pairs or trios, conducting a simulated expert evaluation and writing a technical report. Finally, an open discussion on the topic took place during class.

In addition to the activities described, during the first meeting, students were invited to participate in the research, although participation was voluntary and not a prerequisite for attending classes. The eligibility criteria to join the study included being enrolled in the Physical Therapy program at UFCSPA and in the extracurricular hybrid course, being 18 years of age or older, and having signed the Informed Consent Form (ICF). The sample was selected by convenience (Fletcher;

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Fletcher; Fletcher, 2014). Participants completed a closed and structured questionnaire regarding their sociodemographic characteristics (sex, age, place of residence, employment status, semester of the UFCSPA Physical Therapy program) and experience with digital technologies, solely to determine the sample's familiarity with hybrid courses (with questions regarding access to training opportunities, courses, and professional development, whether this training was conducted according to their interest, whether respondents were satisfied with their academic education and the use of digital technologies in the Physical Therapy program, whether they frequently used video lectures to study, whether they believed an extracurricular course could contribute to their education, and whether they agreed that they found it easy to use computer resources) (pre-intervention questionnaire). Immediately thereafter, a diagnostic assessment featuring a complex clinical case with 12 questions was administered, answered individually in class, covering technical physical therapy expertise content. Participants were required to solve it individually without consulting external sources, aiming to assess their prior knowledge on the topic. No feedback was given to students regarding the clinical case or the correct answers to the questions presented in the diagnostic evaluation. Quantitative data were transcribed and tabulated for analysis using Excel version 2023, being presented further below in absolute and relative values as well as percentages.

From then on, regardless of the virtual or in-person nature of the class, a Likert-type feedback questionnaire was administered after each class regarding the level of satisfaction with the lesson (very dissatisfied, dissatisfied, neither satisfied nor dissatisfied, satisfied, and very satisfied). An open-ended question was also included to evaluate students' self-perception of their learning (Did you learn from the class? Justify.). In virtual meetings, whether synchronous or asynchronous, the same questionnaires were administered via Google Forms. Quantitative data obtained from the Likert-type questions were processed as described above. Meanwhile, qualitative data obtained from the open-ended question were submitted to content analysis, a systematic method of describing and interpreting narratives (Bardin, 2009).

Data collection was discontinued upon reaching thematic saturation (Amado, 2017). The analysis was conducted considering the full content of the responses. Each questionnaire response (individual responses) was transcribed into Excel version 2023, in table format, for categorical analysis. Subsequently, this analysis was used to classify responses into defined categories, facilitating the interpretation of results within the context of physical therapy expertise. In summary, the definition of final categories occurred through the following stages: creation of a table with

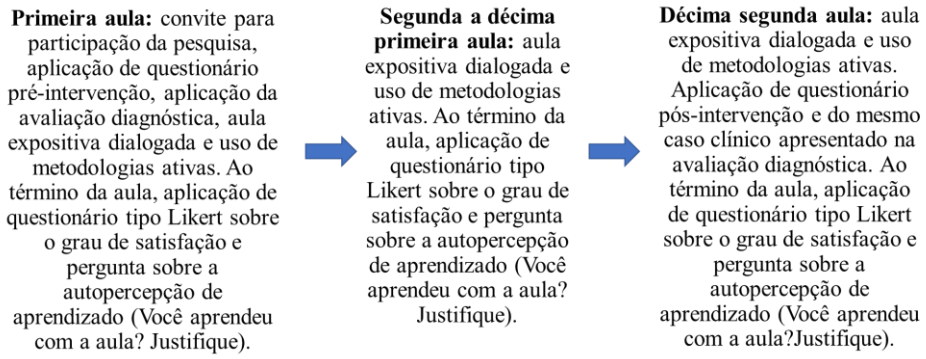
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individual responses, as shown; identification of recording units; and formation of thematic axes. Finally, during the processing of results, inference, and interpretation, the categorization of results was generated (Bardin, 2009). Participants had their anonymity guaranteed, as their names were replaced by acronyms (participant 1 = P1, participant 2 = P2, and so forth).

During the final in-person class, students completed a closed Likert-type questionnaire to evaluate the course (post-intervention questionnaire), with questions assessing whether the way the course was structured (using active methodologies) contributed to their learning on the topic; whether it improved their knowledge; whether activities were well-organized (expository-dialogic lectures and use of active methodologies); whether the hybrid course content was useful for learning or reviewing concepts; whether active participation in course activities aided learning; whether the organization of materials on Moodle helped study planning; whether the active methodologies adopted in the course motivated execution, promoted participation, and fostered engagement throughout course participation; whether the strategies and methods used during the hybrid course were the same as those used in undergraduate classes; whether there was a preference for in-person classes over virtual classes; and whether the materials provided by the instructor were studied prior to coming to class.

These questions were answered with the following options: strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree. Furthermore, the same clinical case from the first meeting, containing 12 questions to be solved, was re-administered individually and without consulting external resources to verify the development of student knowledge (knowledge retention) on physical therapy expertise. Figure 1 below presents the flowchart of the applied methodology.

Figure 1 – Flowchart of the methodology applied in the study on the extracurricular course titled "Introduction to Physical Therapy Expertise" conducted between October and December 2023.



Source: author, 2024.

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3 RESULTS

As observed, the objective of this study was to evaluate student self-perception of learning through the use of active methodologies in a hybrid course on physical therapy expertise. In this case, 12 students agreed to participate in the research. To this end, they signed the ICF and completed the course. The pre-intervention questionnaire revealed a predominance of female participants, representing 75% (n=10), with only two individuals identifying as male. Regarding the academic semester, 8 participants (66.67%) were enrolled in the second semester of the Physical Therapy program at UFCSPA, 2 (16.67%) were enrolled in the final semester, and the remainder (n=2, 16.67%) were in the penultimate semester. The survey indicated that participants were between 18 and 28 years old. Eleven participants (91.67%) resided in the city of Porto Alegre/RS, 1 student (8.33%) resided in Canoas/RS, and 9 individuals (75%) were not engaged in paid employment at that time.

This same questionnaire sought to understand the participants' experiences regarding educational processes involving digital technologies in health education, aiming to determine their previous background with these tools. Among the twelve participants, half reported having access to training opportunities, courses, and professional development, undertaking them according to their interest (50%); 50% of the sample reported being satisfied with their academic education and the use of digital technologies in the Physical Therapy program; 100% frequently use video lectures to study during their academic training; 42% of respondents stated that an extracurricular course can contribute to their education; finally, 67% of participants strongly agreed that they found it easy to use digital resources.

As described in the methodology, a diagnostic assessment of the prior knowledge of participants in the "Introduction to Physical Therapy Expertise" course was also conducted. The average rate of correct answers on the diagnostic assessment during the first class was 10%, data presented at the end of this subsection alongside the results of the re-application of the same instrument after the completion of the course for comparison purposes.

Regarding students' level of satisfaction with the classes, a Likert-type feedback questionnaire was administered, and an open-ended question was formulated to evaluate students' self-perception

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of their learning, as described. All respondents reported being completely satisfied across all classes (100%). As for student self-perception of learning, based on the analysis of findings obtained from the open-ended question, it was possible to arrive at two categories for the qualitative data: A) developing student competencies, referring to skills, knowledge, and attitudes that students reported acquiring and enhancing according to their perceptions; and B) teacher evaluation, referring to the analysis and measurement of teaching performance in educational activities according to their opinions. Regarding the subcategories generated from the identified categories, the following were obtained: A) technical-scientific performance, referring to information related to the combination of technical and scientific knowledge to solve expertise problems; conduct, referring to information associated with the set of professional behaviors, attitudes, and principles; B) organization, referring to information on the planning and structuring of the experienced didactic-pedagogical activities; content, regarding the set of information, concepts, skills, and activities addressed during class; quality, which included information on the effectiveness and relevance of the class in the teaching-learning process; time, in which information regarding the duration designated for conducting the class was included; and punctuality, which included information regarding the practice of starting and ending classes at the schedule-established times, as will be demonstrated in Table 1.

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Table 1 – Developing student competencies and teacher evaluation of the extracurricular course titled "Introduction to Physical Therapy Expertise" conducted between October and December 2023.

Categoria	Subcategorias	EXEMPLO 1	EXEMPLO 2	EXEMPLO 3	EXEMPLO 4
COMPETÊNCIAS DISCENTES EM DESENVOLVIMENTO	ATUAÇÃO TÉCNICO-CIENTÍFICA CONDUTA	"A relação da fisioterapia com a justiça do trabalho é muito maior do que eu pensava, o profissional é responsável por elaborar um laudo detalhado com informações de saúde" (P1) "A avaliação do trabalhador e ambiente de trabalho é complexa e devemos quantificar e qualificar os acometimentos funcionais do paciente" (P5) "Aprendi o que é feito na perícia fisioterapêutica, compreendi sobre a avaliação, o laudo e com quem colaboramos (advogados). Também entendi os requisitos mínimos para um laudo pericial" (P7)	"Eu entendi o papel do perito: auxiliar juiz ou as partes envolvidas no processo, com intuito de passar a opinião especialista e esclarecer melhor as partes que dizem respeito à perícia fisioterapeuta" (P2) "Outro ponto muito importante da aula foi conhecer as varas especializadas em acidentes do trabalho do RS" (P3) "Estudamos que o código de processo civil, reformulado em 2015 (NCPC), regulamenta o processo judicial no Brasil, contendo normas inclusive sobre a nomeação e cadastramento (online) dos peritos no tribunal e sistema de justiça, para que possam ser nomeados para atuar nos casos da justiça do trabalho" (P1)	"Gostei sobre o alerta da peça inicial, que muitas vezes pode ser aumentada por profissionais. Também achei muito importante a descrição detalhada e completa, com muitos termos técnicos, sobre a situação que pode vir a trazer o problema físico do cliente" (P8) "Foi interessante conhecer a proposta de composição de processos e o formato de registros técnicos. Também na descrição dos registros da Perícia Fisioterapêutica: importante embasamento técnico sustentado por referências que respaldam as análises efetivadas, sejam ergonômicas ou físicas-funcionais" (P12) "Foi possível aprender também sobre os passos do processo trabalhista, como a informação de que todos os documentos relacionados a saúde do trabalhador tenham que ser inseridos no processo" (P4)	"Foi interessante ver quais as atuações do perito fisioterapeuta segundo as normas da – ABRAPEFI e COFFITO" (P11) "O perito não pode exceder sua atuação com opiniões pessoais. O laudo deve ser direcionado a perícia, avaliações e achados, não se deve interferir com parcialidade" (P9) "Uma parte muito importante foi o professor ter ressaltado que tanto o reclamado quanto o reclamante podem mentir e omitir informações, afinal muitas vezes nos esquecemos disso e acabamos confiando somente na palavra da outra pessoa e isso não deve ocorrer. Por fim, a apresentação das leis e artigos que definem a atuação dos peritos foi muito importante para o entendimento da aula" (P10)

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AVALIAÇÃO DOCENTE	ORGANIZAÇÃO CONTEÚDO QUALIDADE TEMPO PONTUALIDADE	"Ótima organização. Atividade em grupo interessante e sem muita pressão no aluno" (P3) "A aula me surpreendeu muito, tanto pelo conteúdo quanto pela qualidade" (P1) "Aula dinâmica, clara, pontual e organizada" (P6) "Achei a aula muito bem explicada, objetiva, tempo eficiente e a didática ótima também" (P7)	"Aula densa, então foi um ótimo recurso realizá-la de forma assíncrona para que possamos ver com calma, pausar, anotar, rever e conseguir fixar de forma completa o conteúdo" (P4) "Os conteúdos programados foram abordados de forma clara e bem explicada" (P11) "Aula clara e bem direta, materiais organizados e pontualidade" (P10) "Aula objetiva, áudio bom, qualidade da imagem boa" (P12)	"O conteúdo da aula, mesmo que mais extenso foi de fácil compreensão. A aula foi clara e com bom ritmo, prendendo a atenção" (P12) "Eu gostei de ver em casa, pois sinto que presto mais atenção, principalmente se for em um sábado" (P8) "Gostei muito da aula, o conteúdo foi muito bem explicado, em uma linguagem clara" (P2) "Conteúdo foi muito bem apresentado e todas as dúvidas foram sanadas" (P5)	"Uso do *Kahoot* é uma ação que diversifica a aula, nos faz memorizar/raciocinar de um jeito mais natural" (P8) "Apesar de ser uma aula com um conteúdo mais complexo, o professor conseguiu passar os conteúdos de maneira rápida e bem explicada" (P9) "Aula dinâmica e com interação no final com o jogo que ajuda fixar o conteúdo que foi abordado, gostei muito" (P2) "Pontualidade; boa abordagem do conteúdo; aula dinâmica; boas explicações" (P3)

Source: author (2024).

Legend: ABRAPEFI – Brazilian Association of Physical Therapy Expertise; COFFITO – Federal Council of Physical Therapy and Occupational Therapy. Participant 1 = P1, Participant 2 = P2, and so forth.

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It is observed that the recording units for the emerging categories and subcategories presented in Table 1 represent only examples of student perceptions. Consequently, the presentation of quotes by category/subcategory reflects the illustrative nature of these findings, indicating not the frequency or recurrence of mentions, but rather the diversity of themes addressed by students in their self-perceptions of learning. Still, it is worth highlighting that among the 12 participants, all mentioned the categories/subcategories shown in Table 1 at least once.

Following the completion of the extracurricular course, on the final day of class, as noted, the post-intervention questionnaire was administered. Research participants affirmed that the way the course was structured (using active methodologies) contributed to their learning on the topic (100% of the sample), and most respondents agree or strongly agree that they improved their knowledge of physical therapy expertise (91%). Thus, most students reported that the activities were well-organized (92%), that the hybrid course content was useful for their learning or concept review (100%), that actively participating in course activities aided learning (100%), that the organization of materials on Moodle helped study planning (100%), and that the methodologies adopted in the course motivated execution, promoted participation, and fostered engagement throughout their course participation (100%). Conversely, half of the participants disagree or strongly disagree that the strategies and methods used during the extension course are the same as those used in undergraduate classes (50%). Therefore, students reported disagreeing or strongly disagreeing when questioned about a preference for fully in-person classes (50%). Regarding studying materials before coming to class, half of the students reported accessing the content in advance (50%).

Associated with the pre-intervention and post-intervention questionnaires, whose results were presented above, a diagnostic assessment was administered during the first meeting. As mentioned, no feedback was provided to the students regarding this assessment so that it could be presented again and completed individually on the final day. In the diagnostic assessment of the first meeting, only one individual (8% of the total sample) correctly answered three technical questions. Furthermore, the remaining participants (92% of students) were limited to two or fewer correct answers. Additionally, 8 individuals (67%) left four or more questions unanswered. Comparisons between pre- and post-intervention can be observed below in Table 1.

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Table 1 – General overview of correct and incorrect answers to the clinical case questions (diagnostic assessment), administered on the first and last days of the extracurricular course to evaluate the population's knowledge of the topic of the hybrid course, applied in the extension course "Introduction to Physical Therapy Expertise" developed at UFCSPA between October and December 2023 for physical therapy undergraduate students.

Participante	N° de acertos (pré)	N° de erros (pré)	N° de não respondidas (pré)	Aproveitamento total (% de acertos) – (pré)	N° de acertos (pós)	N° de erros (pós)	N° de não respondidas (pós)	Aproveitamento total (% de acertos) – (pós)
P1	2	8	2	**17%**	11	1	0	**92%**
P2	3	7	2	**25%**	12	0	0	**100%**
P3	2	7	3	**17%**	11	1	0	**92%**
P4	1	6	5	**8%**	12	0	0	**100%**
P5	1	4	7	**8%**	12	0	0	**100%**
P6	0	2	10	**ZERO**	10	2	0	**83%**
P7	2	2	8	**17%**	12	0	0	**100%**
P8	2	6	4	**17%**	10	0	2	**83%**
P9	1	3	8	**8%**	12	0	0	**100%**
P10	1	4	7	**8%**	10	2	0	**83%**
P11	1	2	9	**8%**	10	2	0	**83%**
P12	0	1	11	**ZERO**	9	3	0	**75%**

Source: author (2024).

Legend: Pre – Pre-intervention, application of the clinical case during the first course meeting, in October 2023; Post – Post-intervention, application of the clinical case during the last course meeting, in December 2023.

After the complete execution of the course, during the assessment conducted in the final meeting (the same clinical case from the diagnostic assessment comprising 12 questions), an increase in correct answers to the clinical case questions and a substantial reduction in unanswered items were observed. Furthermore, participants began employing appropriate technical terms and applied technical reasoning in solving the clinical case to classify impairments and establish causal nexus relationships.

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4 DISCUSSION

For the public considered "digital natives," defined as those individuals born after the year 2000 and raised in a context dominated by digital technologies (Prensky, 2009), learning through them extends beyond the physical boundaries of the classroom (Gallo et al., 2024). Most students in the present study were classified as digital natives, which explains why all participants frequently use video lectures to study and why most agree that they easily navigate computerized resources when questioned about their experiences with digital technologies.

In this sense, Quintana and Afonso (2017) corroborate the findings obtained, as they also identified digital natives who used digital technologies in the teaching-learning process and felt satisfied with them in their study. Santos et al. (2024), in their research with health science students with a mean age of 23 years, explain that video lectures represent one form of digital technology utilization and that their importance during academic training is undeniable.

The present study also demonstrated a predominance of female, white, single participants who were not engaged in paid employment. Supporting these findings, De Souza et al. (2014) and Anjoulette and Cardenari (2015) observed in their works that physical therapy students are predominantly women, aged between 18 and 30 years, white, and single.

Furthermore, most participants in the present study state that they have access to training opportunities and courses, undertaking them according to their interest. These data are corroborated by Batista et al. (2016), who demonstrate that flexibility and easy internet access are relevant factors enabling learners to acquire new skills driven by their own motivation. To teach through the hybrid modality, it is necessary to select digital tools capable of supporting the pedagogical objective, integrating technology with the teaching proposal and validating this choice, as the adopted instrument and methodology must exert a positive effect on student learning.

A point to be highlighted is that the boundaries between educational modalities are progressively being eliminated, as an increasing number of digital natives in the classroom are connected to the internet via mobile devices, being simultaneously present physically and virtually alongside their peers and the instructor. Thus, in contemporary times, the physical classroom comes to accommodate experiences acquired in virtual spaces, and there is no turning back, as online and offline environments have become integrated (Maieski et al., 2024).

Accordingly, digital technologies are embedded in daily life and play a leading role in preparing students for an ever-evolving digital society. Therefore, integrating them with active

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methodologies becomes highly advantageous, as combining both gives rise to a powerful synergy that seeks to make learning more meaningful, collaborative, and personalized, thereby enhancing the benefits of both approaches (Gallo et al., 2024).

It should be noted that in this study, various methodologies were employed so that subjects could experience different ways of revisiting theoretical content, given that neuroscience indicates individuals learn in diverse, unique, subjective, and non-transferable ways (Costa, 2023). Consequently, the intention was to provide the subject with opportunities to grasp the contradictions, relationships, and constitutive nexuses of reality (Libâneo et al., 2022). For Libâneo et al. (2022), active methodologies should ideally place the student in an active role and consider individual learning characteristics, thereby rendering learning meaningful. In this process, the ideal approach involves varying the types of tools used in class, triggering the neuronal plasticity of these individuals in diverse ways, as neuroscience explains (Costa, 2023).

It is worth highlighting that the use of active methodologies must be linked to the theoretical-scientific aspect of learning, given that teaching should promote the development of human capacities through the formation of students' theoretical-conceptual thinking, enabling them to understand abstractions and surpass knowledge gained through current experience (Libâneo et al., 2022). The present study corroborates the findings of Libâneo et al. (2022) and Costa (2023) by employing diverse methodologies and conducting discussions and reflections on the topic addressed in class following each session, thereby reinforcing concepts and addressing doubts. As demonstrated by Guimarães et al. (2021), from the perspective of student self-perception, the ideal approach involves alternating dialogic lectures with active methodologies, as the latter serve as a valuable additional teaching tool.

Regarding students' satisfaction level with the classes and student self-perception of learning, it was found that 100% of the students were highly satisfied and agreed that they had learned through the use of active methodologies and digital technologies. Thus, the implementation of software and hardware in the educational process concerning physical therapy expertise became a valuable alternative for expanding the teaching environment, offering more interactive learning through virtual educational applications (e.g., MindMeister, Padlet, Mentimeter, Kahoot, PowerPoint-based game), also utilized as active methodologies. According to student reports, this stimulated curiosity and increased engagement with the covered topics, consistent with the findings described by Miashiro et al. (2020) in their research.

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Regarding the qualitative data obtained concerning student self-perception of learning, participants emphasized the value of active methodologies in the teaching-learning process and suggested incorporating more opportunities with these tools. In this study, statements such as the following were collected: "The Padlet activity was interesting for synthesizing an expert report and identifying the key points of an expertise examination," "The activity developed [mind map] helped increase the level of reading and comprehension of technical documents," "I really enjoyed the class [dramatization]," "This was undoubtedly my favorite class; the game dynamic was great and helped me learn a lot," "I liked it because the class is interactive [peer instruction], the teaching method encouraged me, and the covered content is interesting," and "Using Kahoot diversifies the class and helps us memorize and reason in a more natural way."

One of the points most frequently mentioned by the participants was that the course had been carefully structured, featuring dedicated educational resources created exclusively for it. In this regard, Morán (2015) highlights that active methodologies encourage more efficient learning through practical activities, games, and meaningful projects by fostering collaboration and personalized instruction. This practice was likewise applied in the analyzed hybrid course, providing participants with the opportunity to develop skills in drafting and interpreting physical therapy expert reports in the field of labor health.

Throughout the course, the progress of students in conducting technical analyses of expert cases provided by the instructor and grounded in the suite of teaching and learning tools utilized in class was remarkable. Notably, this growth was also perceived in student self-perception of learning, as previously described. These data are corroborated by Ferri and Soares (2015), who argue that active methodologies contribute to content retention and the enhancement of students' critical thinking capacities.

Regarding the academic content of the proposed course, participants highlighted the relevance of the subject matter studied and, through the Likert-type feedback questionnaire on satisfaction with the classes, indicated that the activities were well constructed and organized. They emphasized the quality of the materials provided, appropriate time management during classes, punctuality of the meetings, and explanations that helped resolve doubts, as illustrated by the narratives: "Dynamic, clear, punctual, and organized," "As always, a very objective class, a very interesting topic, time was left for questions (which is great), and I really liked the practical examples used in the explanations," "Punctuality, good approach to the content, dynamic class, and good explanations," and "The classes

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are always great and direct; the instructor always conveys knowledge clearly and with good examples." According to Bacich and Moran (2017), for learning to be effective, instructors must act as facilitators, encouraging innovation and experimentation in both face-to-face and virtual settings. The focus should remain on guiding students through practical activities and presenting challenges that foster engagement and the acquisition of required competencies.

Regarding the resolution of the clinical case (diagnostic assessment) administered in the first and final meetings, students were found to have refined their skills in solving physical therapy expertise problems when comparing the initial and final evaluations. The mean correct answer rate increased from 11% at the start of the course to 91% at the final application, as demonstrated in the results (noting that no feedback was provided on the diagnostic assessment questions administered on the first day of class in October, and that the evaluation was repeated in December of the same year—a two-month interval).

Furthermore, a potential study limitation should be noted, given that physical therapy expertise is not a mandatory component of undergraduate Physical Therapy curricula, as previously stated; thus, knowledge gains after the course can be expected, regardless of the methodologies used. Since this study did not intend to quantify learning in terms of performance, but rather to evaluate student self-perception of learning, we simply demonstrate that volunteers were able to solve the clinical case, applying the concepts covered in class and relating the equipment and expert reports examined during the course activities.

In this regard, Assunção (2021) ratifies that administering a diagnostic evaluation allows for verifying progress in the student teaching-learning process, since comparing an initial and a final assessment highlights teaching effectiveness and significant individual performance improvement. In addition, Acrani et al. (2020) describe that diagnostic assessment should identify student needs within the educational process, and pedagogical strategies should enhance student skills and competencies throughout learning. Thus, by identifying these difficulties, different methodologies can be sought in the teaching-learning process as a means of addressing gaps and foster the advancement of student knowledge (Guimarães et al., 2021).

Turning to the final day of the course, when the post-intervention questionnaire was administered, students reported having learned relevant content regarding the subject matter studied. In a similar study, Droescher and Silva (2014) show that well-structured extracurricular courses tend to offer relevant and motivating learning to their participants. The improvement in physical therapy

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expertise knowledge was described by most participants in this study, which was also demonstrated in the work of Da Veiga et al. (2019), highlighting positive outcomes in their research on the impact of complementary training in an extracurricular Physical Therapy course. Participants' narratives underscored the organization of the present hybrid course and its consistency with students' expected outcomes, reinforcing the value of pedagogical organization for learning promotion noted by Garcia et al. (2020), who emphasize the importance of a well-structured methodology for the success of the teaching-learning process.

The unanimity regarding the practical utility of the course is tied to the hands-on application of the content, a factor highlighted by several researchers as crucial for continuous learning (Leite et al., 2021; Souza et al., 2023). The use of games as a teaching tool was also a preference expressed by most participants in this study, aligning with research that underscores educational games as an effective means to foster engagement and learning, as pointed out by Droescher and Silva (2014).

Furthermore, students strongly agreed that actively participating in the course aided their learning, a factor strongly correlated with effective learning, as discussed in the literature on participatory methodologies in education (Roman et al., 2017). In this scenario, the use of Moodle as an educational platform proved useful for study planning, corroborating other authors who describe the effectiveness of VLEs [Virtual Learning Environments] in organizing and supporting classes (Assunção, 2021; Porto & Battestin, 2022).

A relevant point is that only half of the students accessed the content before the meetings in the course "Introduction to Physical Therapy Expertise," pointing to an opportunity to reinforce the importance of preparation, as indicated by studies from Pavanelo and Lima (2017) and Valente (2014), which state that early access to materials can significantly improve performance in courses. Motivation and engagement are essential aspects for success in any educational process, as demonstrated by Leite et al. (2021), who argue that active methodologies are fundamental strategies for fostering this type of involvement among higher education students. Meanwhile, the varied teaching methods utilized in the analyzed hybrid extracurricular course compared to those experienced by students during undergraduate studies reflect diverse expectations and experiences—a phenomenon previously discussed by Roman et al. (2017), who highlighted how methodological innovation can elicit positive and motivating responses from students.

A limitation of the present study concerns the use of questionnaires with responses restricted to "yes" or "no," which may lead to acquiescence bias, wherein participants might feel inclined to

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agree with the researchers by responding positively ("strongly agree; it was good/great") (Bispo Júnior, 2022). Consequently, responses were corroborated by consistent rationale collected during classes, strengthening the validity of the findings. This study also presented a limitation regarding its small sample size, which could be expanded to other populations in future research. Nevertheless, observations derived from the questionnaires and class feedback indicate that the intervention was an effective resource in the teaching-learning process of Physical Therapy students.

5 CONCLUSION

The results obtained reveal that Physical Therapy students at UFCSPA were satisfied with the hybrid extracurricular course ("Introduction to Physical Therapy Expertise") regarding both the content and the active methodologies employed, reporting that the activities developed contributed to student learning, according to their self-perceptions. These findings reinforce the relevance of approaches combining active methodologies and hybrid courses, demonstrating that adopting varied pedagogical practices in higher education within the health sciences can serve as an effective educational adjunct and contribute to its enhancement, in line with previous studies discussed throughout this article.

It is worth noting that the presented results pertain to a specific sample and a cross-sectional design, highlighting the need for further studies to broaden the understanding of these findings. Evaluating student learning, which was beyond the scope of this study, also represents an opportunity for future research.

REFERENCES

ACRANI, Simone et al. A utilização do inventário de kolb como estratégia de diagnóstico e planejamento de metodologias ativas para otimizar o processo de ensino-aprendizagem. **Brazilian Journal of Development**, v. 6, n. 2, p. 7882–7893, 2020.

AMADO, João. **Manual de Investigação Qualitativa em Educação**. 3rd ed. Coimbra: Imprensa da Universidade de Coimbra, 2017.

ANJOULETTE, Polianna Marques; CARDERARI, Monika Santana. Perfil sociodemográfico e acadêmico de discentes de fisioterapia de uma instituição de ensino superior. In: **CONGRESSO**

This work is licensed under a
Creative Commons License

DOI: http://doi.org/10.53628/emrede.v13i1112 ISSN 2359-6082

NACIONAL DE INICIAÇÃO CIENTÍFICA DO CENTRO UNIVERSITÁRIO CATÓLICO SALESIANO AUXILIUM, 16., 2015, Araçatuba. **Proceedings [...]**. Araçatuba: Unisalesiano, 2015.

ASSUNÇÃO, Ada Ávila. Metodologias ativas de aprendizagem: práticas no ensino da Saúde Coletiva para alunos de Medicina. **Revista Brasileira de Educação Médica**, v. 45, n. 3, p. e145, 2021.

BACICH, Lilian; MORÁN, José. **Metodologias ativas para uma educação inovadora: uma abordagem teórico-prática**. Porto Alegre: Penso, 2017.

BARDIN, Laurence. **Análise de conteúdo**. Rev. and updated ed. Lisboa: Edições 70, 2009.

BATISTA, Edila Pablizia Cavalcante et al. A internet como ferramenta extensionista. **Revista Ciência em Extensão**, v. 12, n. 4, p. 174–182, 2016.

BERBEL, Neusi Aparecida Navas. A metodologia da problematização em três versões no contexto da didática e da formação de professores. **Revista Diálogo Educacional**, v. 12, n. 35, p. 103–120, 2012.

BIELLA, Ana Flávia de Carvalho Lima et al. Tecnologias de informação e comunicação: revolucionando o ensino e aprendizado da fisioterapia. **Revista Ibero-Americana de Humanidades, Ciências e Educação**, v. 10, n. 8, p. 2460–2468, 2024.

BISPO JÚNIOR, José Patrício. Viés de desejabilidade social na pesquisa qualitative em saúde. **Revista de Saúde Pública**, São Paulo, v. 56, p. 101–109, Dec. 2022. Available at: https://rsp.fsp.usp.br/artigo/vies-de-desejabilidade-social-na-pesquisa-qualitativa-em-saude. Accessed on: Mar. 4, 2022.

BOLLELA, Valdes Roberto. Sala de aula invertida na educação para as profissões de saúde: conceitos essenciais para a prática. **Revista Eletrônica de Farmácia**, v. 14, n. 1, 2017.

CASTILHO, Éllen Patrícia Alves; HAYDU, Verônica Bender. Utilização do Kahoot! em procedimentos de ensino: Uma revisão sistemática da literatura. **Revista Portuguesa de Educação**, v. 37, n. 1, p. e24012, 2024.

COSTA, Raquel Lima Silva. Neurociência e aprendizagem. **Revista Brasileira de Educação**, n. 28, 2023.

DA COSTA, Anna Karoline Vargas et al. Tecnologias da informação e comunicação: educação em saúde e educação permanente voltadas à covid-19. **Revista de Enfermagem e Atenção à Saúde**, v. 13, n. 1, 2024.

DA VEIGA, Litieli et al. A importância da extensão universitária na formação dos acadêmicos da saúde. **Cadernos de Educação, Saúde e Fisioterapia**, v. 6, n. 12, 2019.

DE OLIVEIRA, Muriel Batista et al. O ensino híbrido no Brasil após pandemia do covid-19. **Brazilian Journal of Development**, v. 7, n. 1, 2021.

This work is licensed under a
Creative Commons License

DOI: http://doi.org/10.53628/emrede.v13i1112 ISSN 2359-6082

DE SOUZA, Josiane Vieira et al. Perfil dos alunos universitários dos cursos de educação física e fisioterapia em relação à alimentação e à atividade física. **Revista Práxis**, v. 6, n. 11, 2014.

DROESCHER, Fernanda Dias; SILVA, Edna Lucia da. O pesquisador e a produção científica. **Perspectivas em Ciência da Informação**, v. 19, p. 170–189, 2014.

FABRIN, Saulo et al. Construção do conhecimento anatômico dos planos e eixos do corpo humano por meio de livro eletrônico-ebook. In: **ENCONTRO DE PESQUISADORES EM EDUCAÇÃO A DISTÂNCIA**, 2014, São Carlos. **Proceedings SIED/ENPED [...]**. São Carlos: Horizonte, 2014. Available at: https://ciet.ufscar.br/submissao/index.php/ciet/article/view/2296. Accessed on: Oct. 12, 2024.

FERRI, Kathynne Carvalho Freitas; SOARES, Lívia Maria Araújo. O jogo de tabuleiro como recurso didático no ensino médio: uma contextualização do ensino de química. **Anais da Semana de Licenciatura**, Jataí, v. 1, n. 1, p. 315–327, 2015. Available at: https://periodicos.ifg.edu.br/semlic/article/view/501. Accessed on: Jul. 10, 2026.

FIDLER, Mariella; PRESTES, Rosangela Ferreira. Educação híbrida e ensino de arte. **Boletim Técnico-Científico**, v. 9, n. 1, 2024.

FLETCHER, Robert H.; FLETCHER, Suzanne W.; FLETCHER, Grant S. **Epidemiologia clínica: elementos essenciais**. 5th ed. Porto Alegre: Artmed, 2014.

FRANCO, Bárbara et al. Metodologias ativas de aprendizagem da língua inglesa: explorando mentimeter, padlet e lyrics training. **Revista CBTecLE**, v. 8, n. 1, p. 124–135, 2024.

GALLO, Solange Aparecida et al. Metodologias ativas e tecnologia na educação. **Revista Ilustração**, v. 5, n. 1, p. 27–36, 2024.

GARCIA, Tânia Cristina Meira et al. Ensino remoto emergencial: proposta de design para organização de aulas. **Institutional Repository of the Federal University of Rio Grande do Norte**, Natal, 2020. Available at: https://repositorio.ufrn.br/bitstream/123456789/29767. Accessed on: Aug. 12, 2024.

GUIMARÃES, Alexsandro Ferreira et al. Práticas lúdicas no ensino de Fisiologia. **Revista Docência do Ensino Superior**, v. 11, p. 1–20, 2021.

GUIMARÃES, Ueudison Alves et al. Formação de professores: metodologias ativas envolvendo teoria e prática. **RECIMA21 - Revista Científica Multidisciplinar**, v. 4, n. 4, 2023.

LEHM, James; SCHMIDT, Jelson Budal. Fisioterapia Forense. **Monumenta - Revista de Estudos Interdisciplinares**, v. 4, n. 8, p. 69–101, 2023.

LEITE, Kamila Nethielly Souza et al. Utilização da metodologia ativa no ensino superior da saúde: revisão integrativa. **Arquivos de Ciências da Saúde da UNIPAR**, v. 25, n. 2, 2021.

This work is licensed under a
Creative Commons License

DOI: http://doi.org/10.53628/emrede.v13i1112 ISSN 2359-6082

LEOPOLDINO, Anna Paula de Carvalho Couto et al. Rodas de Conversa: Percursos e Diálogos para Pensar a Educação Geográfica e a Formação de Professores. **Revista Interacções**, v. 19, n. 66, p. 1–20, 2023.

LIBÂNEO, José Carlos et al. (Org.). **Didática e formação de professores: embates com as políticas curriculares neoliberais**. Goiânia: Cegraf UFG, 2022. E-book. Available at: https://cepedgoias.com.br/wp-content/uploads/2022/04/PDF_Edipe_2.pdf. Accessed on: May 28, 2025.

LIMEIRA, Carlos Felippe Dias et al. Avaliação, análise e desenvolvimento de jogo sério digital para desktop sobre sintomas e procedimentos de emergência do Acidente Vascular Cerebral. **Blucher Design Proceedings**, v. 2, n. 2, p. 398–409, 2015.

LUCAS, Ricardo Wallace das Chagas. **Fisioterapia Forense**. Florianópolis: Rocha, 2009.

LUCAS, Ruti Irley da Costa. **Educação à distância: o uso da ferramenta fórum de discussão na plataforma virtual Moodle**. Academic Monograph (Postgraduate Specialization in Educational Informatics) – Instituto Federal do Amapá, 2024. Available at: https://repositorio.ifap.edu.br/items/3ac70c83-064d-49ae-83d3-8f76335b8c60. Accessed on: Oct. 10, 2024.

MAIESKI, Alessandra et al. Educação Híbrida, Educação Digital e os contextos brasileiros: o muito a debater e aprender. **Revista EmRede**, 2024.

MAZUR, Eric. **Peer instruction: a revolução da aprendizagem ativa**. Porto Alegre: Penso, 2015.

MIASHIRO, Gabriel et al. Uso de Softwares Educativos no Ensino de Matemática nos Anos Iniciais do Ensino Fundamental. **Anais CIET:Horizonte**, São Carlos, v. 5, n. 1, 2020. Available at: https://ciet.ufscar.br/submissao/index.php/ciet/article/view/710. Accessed on: Sep. 20, 2022.

MONTEIRO, Gabriela Souza. **Rotas da vida: reverberações da construção de um jogo de tabuleiro no contexto da educação**. 2024. Undergraduate Thesis (Bachelor's in Visual Arts) – Universidade Federal do Rio Grande do Sul, Porto Alegre, 2024. Available at: https://lume.ufrgs.br/handle/10183/279607. Accessed on: Oct. 12, 2024.

MORÁN, José. Mudando a educação com metodologias ativas. In: **Convergências midiáticas, educação e cidadania: aproximações jovens**. v. 2, n. 1, p. 15–33, 2015.

NITCHOT, Athitaya; GILBERT, Lester. Comparison of Mytelemap and MindMeister in using competence maps for self-learning. **Technology, Pedagogy and Education**, v. 34, n. 1, p. 69–89, 2025.

PAVANELO, Elisangela; LIMA, Renan. Sala de Aula Invertida: a análise de uma experiência na disciplina de Cálculo I. **Bolema: Boletim de Educação Matemática**, v. 31, p. 739–759, 2017.

PEDRA, Marielza Nascimento. Tecnologia Educacional como Suporte no Processo de Ensino/Aprendizagem. **RACE - Revista de Administração do Cesmac**, v. 9, p. 95–104, 2021.

This work is licensed under a
Creative Commons License

DOI: http://doi.org/10.53628/emrede.v13i1112 ISSN 2359-6082

PORTO, Bruno; BATTESTIN, Vanessa. Tendências das Propostas de Gamificação no Moodle: uma Revisão Sistemática. **EaD em Foco**, v. 12, n. 1, 2022.

PRENSKY, Marc H. Sapiens digital: from digital immigrants and digital natives to digital wisdom. **Innovate: Journal of Online Education**, v. 5, n. 3, 2009.

QUEIROZ, Rosane Gomes et al. O uso do mentimeter como recurso de aprendizagem na disciplina de história-relato de experiência no ensino médio em uma escola de Lábrea-AM. **Revista Ibero-Americana de Humanidades, Ciências e Educação**, v. 9, n. 8, p. 1691–1700, 2023. Available at: https://periodicorease.pro.br/rease/article/view/10965. Accessed on: Oct. 8, 2024.

QUINTANA, Alexandre Costa; AFONSO, Luís Eduardo. Satisfação em aprender: identificando a percepção dos estudantes sobre o uso de tecnologias da educação. **Cuadernos de Contabilidad**, v. 18, n. 46, p. 188–197, 2017.

ROMAN, Cassiela et al. Metodologias ativas de ensino-aprendizagem no processo de ensino em saúde no Brasil: uma revisão narrativa. **Clinical and Biomedical Research**, Porto Alegre, v. 37, n. 4, p. 349–357, 2017.

RUBTSOV, Vitaly. A atividade de aprendizado e os problemas referentes à formação do pensamento teórico dos escolares. In: GARNIER, Catherine; BEDNARZ, Nadine; ULANOVSKAYA, Irina (Org.). **Após Vygotsky e Piaget: perspectivas social e construtivista; escolas russa e ocidental**. Porto Alegre: Artes Médicas, 1996.

SALVADOR, César Coll. **Aprendizagem escolar e construção do conhecimento**. Translated by Emília de Oliveira Dihel. Porto Alegre: Artes Médicas, 1994.

SANTOS, Najara Farias Rosa et al. Percepção dos alunos sobre o uso das ferramentas online durante o ensino remoto em cursos de graduação em saúde. **Revista Valore**, v. 9, e-9002, 2024.

SEKULER, Robert; WATAMANIUK, Scott N. J.; BLAKE, Randolph. Motion perception. **Steven's Handbook of Experimental Psychology**, v. 1, p. 121–176, 2002.

SOUZA, Marina Rocha Fonseca et al. Curso on-line sobre saúde bucal do idoso voltado para cuidadores, alunos e profissionais da saúde: relato de experiência e grau de satisfação dos participantes. **Expressa Extensão**, v. 28, n. 2, p. 142–151, 2023.

SOUZA, Noemy dos Reis et al. Teatro como metodologia formativa na graduação em enfermagem. **Revista Enfermagem Contemporânea**, v. 12, p. e5183, 2023.

TONELOTTO, Josiane Maria de Freitas; GONÇALVES, Vanda Maria Gimenes. Autopercepção de crianças desatentas no ambiente escolar. **Estudos de Psicologia**, Campinas, v. 19, p. 31–41, 2002.

VALENTE, José Armando. Blended learning e as mudanças no ensino superior: a proposta da sala de aula invertida. **Educar em Revista**, v. 4, p. 79–97, 2014.

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Creative Commons License

DOI: http://doi.org/10.53628/emrede.v13i1112 ISSN 2359-6082

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XAVIER, Jaqueline Antonia. **A espiral construtivista: narrativa crítico-reflexiva a respeito da trajetória de graduação em medicina**. Institutional Repository of UFSCar, São Carlos, 2023. Available at: https://repositorio.ufscar.br/handle/ufscar/19451. Accessed on: Sep. 5, 2024.

ZUKOWSKY-TAVARES, Cristina et al. Ensino híbrido em saúde: um estudo de revisão da literatura. **Research, Society and Development**, v. 12, n. 2, 2023.

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DOI: http://doi.org/10.53628/emrede.v13i1112 ISSN 2359-6082