

## **The participation of human anatomy monitoring in the teaching and student learning process: a critical review of the literature**

**A participação da monitoria de anatomia humana no processo de ensino e aprendizagem discente: uma revisão crítica da literatura**

**La participación del monitoreo de la anatomía humana en el proceso de enseñanza y aprendizaje de los estudiantes: una revisión crítica de la literatura**

Received: 05/08/2022 | Reviewed: 05/15/2022 | Accept: 05/20/2022 | Published: 05/25/2022

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### **Abstract**

Implemented in Higher Education Institutions (HEIs) for some years, the monitoring activity is understood as a pedagogical resource to strengthen the teaching and learning process through the establishment of new pedagogical and experiential practices and experiences. In this work we aim, through an integrative review, to describe the monitoring activity of human anatomy in the process of teaching and student learning. The PICo strategy was used to form the guiding question, the results were presented through the Prisma Flow diagram. The databases consulted were Scielo, Portal Capes and Google Scholar, searching for articles from 2011 to 2021. Our results show that in addition to generating a strengthening of learning, the monitoring activity provides an incentive for teaching and is a collaborative and cooperative moment. between peers making the teaching and learning process active. In the search for a more critical and reflective professional future for the demands of today's world.

**Keywords:** Human anatomy; Monitoring; Teaching; Learning.

### **Resumo**

Implementada nas Instituições de Ensino Superior (IES) já há alguns anos, a atividade de monitoria é compreendida como recurso pedagógico para o fortalecimento do processo de ensino e aprendizagem por meio do estabelecimento de novas práticas e experiências pedagógicas e vivenciais. Neste trabalho objetivamos através de uma revisão integrativa, descrever atividade de monitoria de Anatomia humana no processo de ensino e aprendizagem discente. Utilizou-se a estratégia PICo para a formação da pergunta norteadora, os resultados foram apresentados através do diagrama Prisma Flow. As bases de dados consultadas foram Scielo, Portal Capes e Google Scholar, buscando artigos no período de 2011 a 2021. Nossos resultados mostram que além de gerar um fortalecimento do aprendizado, a atividade de monitoria proporciona um incentivo à docência é um momento colaborativo e cooperativo entre pares tornando o processo de ensino e aprendizado ativo. Na busca de uma futuro profissional mais crítico e reflexivo para as exigências do mundo atual.

**Palavras-chave:** Anatomia humana; Monitoria; Ensino; Aprendizagem.

## Resumen

Implementada en las Instituciones de Educación Superior (IES) desde hace algunos años, la actividad de seguimiento se entiende como un recurso pedagógico para fortalecer el proceso de enseñanza y aprendizaje a través del establecimiento de nuevas prácticas y experiencias pedagógicas y vivenciales. En este trabajo pretendemos, a través de una revisión integradora, describir la actividad de seguimiento de la anatomía humana en el proceso de enseñanza y aprendizaje de los estudiantes. Se utilizó la estrategia PICO para formar la pregunta guía, los resultados se presentaron a través del diagrama Prisma Flow. Las bases de datos consultadas fueron Scielo, Portal Capes y Google Scholar, buscando artículos de 2011 a 2021. Nuestros resultados muestran que además de generar un fortalecimiento del aprendizaje, la actividad de seguimiento incentiva la enseñanza y es un momento colaborativo y cooperativo entre compañeros haciendo activo el proceso de enseñanza y aprendizaje. En la búsqueda de un futuro profesional más crítico y reflexivo ante las exigencias del mundo actual.

**Palabras clave:** Anatomía humana; Vigilancia; Enseñando; Aprendizaje.

## 1. Introduction

One of the main pillars of science in health education is human anatomy. Learning it is of paramount importance for the development of the skills and competencies of these future professionals (Ruzycki et al., 2019). Traditionally, the act of teaching anatomy was based on cadaver dissections and didactic lectures. Currently, in view of curricular changes, new strategies are taking place, and “passive” learning makes room for the introduction of new methods that actively involve students, in addition to the traditional methodology of teaching (Woodcock et al., 2019). Given this scenario, it is observed the increase in the presence of student monitors during the teaching and learning process of human anatomy, making it a cooperative, reflective, and especially creative moment (Alcântara et al., 2021).

In Brazil, the complementary monitoring activity was instituted in 1968, with Law nº 5.540/68 (Borsatto et al., 2006) and ratified in 1996 with Law nº 9.394, called the Law of Guidelines and Bases of National Education (LDB). These laws establish the use of students in teaching, research and extension activities. Subsequently, new decrees delegate to Higher Education Institutions (HEIs) to regulate such activity, vetoing the possibility of its use as a substitute for any teaching activity (Nunes et al., 2014).

In resume, the monitor develops an activity that aims the improvement of the process of professional training and promotes the amelioration of the quality of teaching and learning in a space for exchanging knowledge (Souza et al., 2020). The student monitor has a fundamental role in peer learning, being a facilitator of knowledge that is learned inside and outside the classroom, and also a link between student and teacher (Moutinho, 2015). In addition, the monitor provides an opportunity to experience the teacher training process (Fonseca & Borges, 2021).

Based on these premises, the objective of this work was to carry out an integrative review of articles published from 2011 to 2021 on the process of teaching and student learning during the monitoring activity of Human Anatomy.

## 2. Methodology

The monitoring of human anatomy in the student teaching and learning process was chosen as the theme of this research. To prepare the guiding question, was used the PICO Strategy, avoiding unnecessary searches. Based on an acronym where:

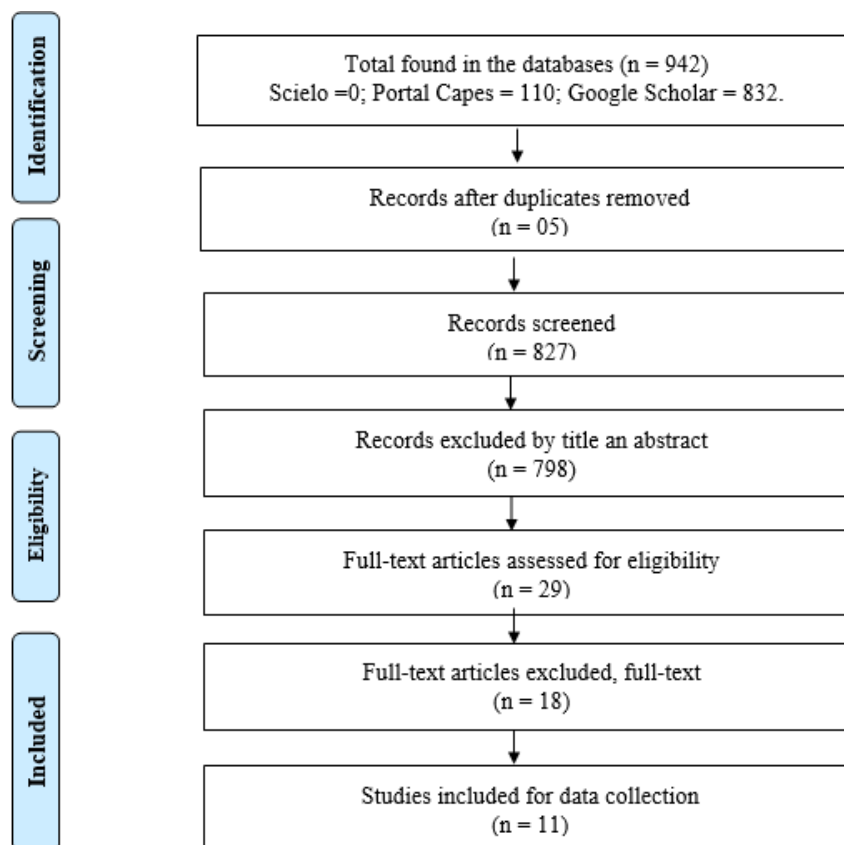
- “P” stands for population/patient;
- “I” stands for intervention/interest;
- “C” stands for comparison/context;
- “o” stands for outcome

Based on this, the following research question was defined: What are the contributions of the Human Anatomy monitoring activity to the teaching and learning process of students in the health area?

Subsequently, was carried out the integrative review, which consists of a broad method that allows the inclusion of different types of study, such as experimental and non-experimental, in order to synthesize the knowledge for understanding the theme or phenomenon (Souza et al., 2010).

To search for the articles used in this review, a search was made in the following databases: Scielo, Portal da Capes and Google Scholar, using the following combinations of words: “monitoring” and “human anatomy” and “teaching”. The inclusion criteria used were articles published in Portuguese, English, or Spanish between the years 2011 and 2021 related to the guiding question of this article. The exclusion criteria used were theses, dissertations, monographs, abstracts, languages not listed in the inclusion criteria, review articles, duplicate articles, and articles outside the study topic. Figure 1 presents more detailed information on the selection, inclusion, and exclusion of works identified in the databases (Andrade et al., 2019).

**Figure 1** - Representation of the selection process of studies through Prisma 2009Flow Diagram.



Source: The authors for Prisma 2009 Flow Diagram (2022).

After the selection of articles to be included in the integrative review, the following information was compiled in a table: author and year, methodology, objective of the work, design, main outcomes, and journal of publication. After the assembly of data in that table, the collected information was discussed.

### 3. Results and Discussion

The data collection process of the included studies revealed that eleven studies answered the research question within the period 2011 to 2021.

**Table 1** - Summary of the results found.

Author and year	Methodology used	Objectives	Study design	Main outcomes	Journals
Neto & Andrade, 2016	A descriptive method with a cross-section and qualitative and quantitative approach.	Evaluate academic monitoring as inventive the teaching career, as well as perceiving the main activities developed by the monitors and their performance in assignments as academic and future professionals.	As a data collection instrument, an online satisfaction and performance evaluation questionnaire, for frequency distribution and direct description of the data. The sample consisted of monitors working at a private higher education institution in the city of Juazeiro do Norte-CE.	It revealed to the students/monitors new horizons and perspectives, both academic and professional. Being able to contribute to the awakening of the vocation and/or to prevent future errors in the performance as to future professionals, in them social relations in the labor market.	Revista Interfaces: Saúde, Humanas e Tecnologia
Costa et al., 2020	A descriptive method with a quantitative approach.	To evaluate the impact of academic monitoring in the discipline of Human Anatomy for Nursing students.	As an instrument, a questionnaire with 12 subjective questions was used, carried out in a private higher education institution in the city of Aracati-CE, with students from the nursing course who attended the monitoring activity.	The students reported that they were able to better understand the knowledge related to human anatomy, since the monitors have verbal clarity, in addition to a good relationship. They claimed to be essential for strengthening learning.	Revista Enfermagem Atual In Derme
Batista, Strini, & Strini, 2019	A descriptive study of the experience report type.	To report the experience of academic monitoring activities carried out in the Human Anatomy discipline of the Medicine course at the Federal University of Jataí.	Report of performance of the Medicine student as a monitor of the Human Anatomy discipline of the course itself.	It is concluded that the activity favored the best use of the studies, allowing a greater understanding of the contents taught by the teacher in the classes, associated with the clarification of doubts brought by the students. It also allowed greater contact with the anatomical parts, which improved learning conditions and knowledge retention. In addition, it betters the stimulation of the monitor's creativity and the development of teaching-related skills.	Brazilian Journal of Development
De Moraes et al., 2016	The study is of the qualitative nature of the experience report type.	To report the importance of the monitoring experience in the academic life of student-monitors of the discipline of Human Anatomy.	Report of experience lived by student-monitors of the discipline of Human Anatomy, course of Physiotherapy at Universidade De Pernambuco (campus Petrolina) from March 2013 to December 2014.	The study demonstrated the possibility of experiencing teaching, research, and extension proposals, involving various activities that go beyond the barriers of the laboratory, or the classroom. Monitoring presents gains in several areas required in the Physiotherapy job market.	Travessias.

Fonseca & Borges, 2021	Quantitative and qualitative descriptive study and experience report.	Assess the monitor performance and the importance of remote monitoring in the pandemic period.	Nine human systems were studied in the form of problem cases, which were later evaluated through a questionnaire.	It was found that the monitoring process benefits not only the monitor or the teacher but the entire chain that is involved within the teaching-learning process.	Revista científica multidisciplinar
Brandli & de Andrade, 2019	A descriptive study of the experience report type.	The objective was to report the experience in the relationship of voluntary monitoring for students entering the year 2018 of undergraduate courses at Campus Uruguaiana of UNIPAMPA.	The study reported the monitoring experience that started in March 2018 and has been taking place until the present moment. There were 8 hours of monitoring per week, 3 hours accompanying the professor and students during practical classes, and 5 hours during free study hours in the anatomy laboratory.	It was possible to perceive that the students feel a lot of security during the learning process with the presence of the monitors. Because some students who are shy during classes feel more comfortable asking their questions at these times.	Brazilian Journal of Health Review.
Miazaki et al., 2011	A descriptive method with a quantitative approach.	Identify the interface between anatomy monitoring and medical training.	Different questionnaires were applied to the professors, the academic monitors, and the non-monitors of the Faculty of Medicine of Jundiá.	The frequency of students in Anatomy monitoring is directly associated with the academic performance of the discipline. The greater the participation, the greater the performance. Anatomy monitoring provides important learning for non-monitor students and even greater learning for monitors.	Perspectivas Médicas
Tavares et al., 2017	Descriptive study, experience report type.	To describe the contributions of human anatomy monitoring in the academic training of Nursing students.	It sought to report the performance of the Human Anatomy monitoring activity in a Higher Education Institution, from August to December 2014 and from August to December 2015, the Nursing course.	It was possible to observe that the monitoring facilitated learning in human anatomy, in addition to providing the academic-monitor with the teaching experience, it also helped in the mediation between nursing students and professors.	Revista de enfermagem da UFPE online
Barbosa et al., 2021	Experience report.	To describe the experiences lived in the academic monitoring program in the discipline of Human Anatomy.	He reported the experience of nursing students regarding academic monitoring in the discipline of Human Anatomy, directed to the class in the first period of the nursing course at a University Center in Manaus.	It demonstrated the importance of personal and professional development, providing growth and deepening in the contents of Human Anatomy. It also made it possible to review the contents taught in class, as well as to acquire new knowledge.	Revista Eletrônica Acervo Enfermagem
Corveloni et al., 2021	A descriptive, cross-sectional, and quantitative study.	To analyze the influence of academic monitoring in Human Anatomy on the performance of Physiotherapy students.	A total of 44 students from the Physiotherapy course at the Federal University of Jataí participated in the study. All the participants were duly enrolled in the discipline of Anatomy	A positive correlation was found between monitoring frequency and student performance, in relation to the grades obtained in the discipline. Observing a positive influence of monitoring in the teaching-learning process, or of Physiotherapy students.	Interdisciplinary Journal of Health Education

			human.		
de Souza et al., 2020	A quantitative and qualitative approach.	Check the influence of academic monitoring of human anatomy on the performance of students, knowing the perception of teachers and monitors regarding the practice of this activity.	The research was developed at the Federal University of Goiás, between 2015 and 2016. With a population of 169 students, distributed in the courses in the health area who are enrolled or who attended the disciplines of Human Anatomy and/or Neuroanatomy. Twenty-one human anatomy and neuroanatomy monitors were evaluated. The data collection was obtained through the application of three questionnaires with objective and descriptive questions for each group.	The activity contributes positively to the academic performance of monitors and students. It provides assistance to teachers with regard to teaching classes and solving students' doubts regarding the content. A limitation found was the lack of studies to compare the results obtained, suggesting more research in this area, in order to better cover, statistically, the entire sphere of the monitoring program, according to the category (student, monitor, teacher-advisor).	Arquivos do Mudi

Source: Authors (2022).

### 3.1 Contributions to encourage teaching

According to Barletta (2011, p. 2):

“There is a noticeable gap in the training of university professors, especially in the area of health, with regard to knowledge of pedagogical didactics. The professors are, for the most part, masters and doctors in a given technical area, they have vast knowledge and experience in the area in which they work. Despite this, in general, they were not prepared for the activity of teaching, of facilitating knowledge in a way that will promote a critical and transforming vision of the performance of the future professional”.

However, the monitoring activity provides a unique experience of discovery for the teaching vocation to the participating students (Batista et al., 2019). Enabling direct contact with everyday academic situations, from the process of pedagogical contribution to the development of activities in teaching and learning to the conduct issues of the academics themselves, each proves to be inconvenient and discouraging (Souza & Gonçalves, 2009).

For Neto e Andrade (2016), monitoring reveals new horizons and perspectives both academically and professionally, awakening vocation and/or preventing errors in choosing to act in the job market. It shows, in essence, the intention to provide “training” for a future teaching career (Tavares et al., 2017).

When we look at the discipline of Human Anatomy, which has both a theoretical and practical character, monitoring provides a differential for future professionals who choose a teaching career in this area. Since she expands her scientific repertoire and develops practical skills through her day-to-day experiences, both with other professors and with other academics.

### 3.2 Peer instruction

We can look at the monitoring activity as a form of peer learning. This active pedagogical strategy introduced in 1991 by Eric Mazur, in his physics classes at Harvard University, aims at cooperative learning with greater student involvement in the collaborative construction of knowledge.

As soon as the student monitor is considered a facilitator of knowledge, transmitting content in a simpler way with motivation, using an easy-to-understand language in the exchange of information, in addition, there is greater integration between student monitor and other colleagues, since himself is also an academic with more experience in the discipline (Haagi et al., 2008; Costa et al., 2020).

In addition, while the monitor supports the teaching and learning process of other students, it broadens their knowledge of specific concepts, deepens their interdisciplinary knowledge and stimulates their communication, and interpersonal skills (De Moraes et al., 2016).

Being a monitor in Human Anatomy is much more than just answering what you were asked, it is finding a unique way of explaining, translating knowledge, turning it into something palpable and at the same time a form of mutual construction of new knowledge (Brandli & Andrade, 2019; Miazaki et al., 2011; Barbosa et al., 2021).

### 3.3 Strengthening the learning process

For the discipline of Human Anatomy, which is part of the basic sciences and has a very complex teaching and learning process, since it covers a large number of concepts and structures to be studied, monitoring has a fundamental role (Barbosa et al., 2021).

Among the mapped studies, it was observed that monitoring acted in an impactful way in strengthening student learning, favoring better use, greater understanding and retention of knowledge. Consequently, better performance in both the human anatomy, and related subjects (De Souza et al., 2020; Corveloni et al., 2021; Miazaki et al., 2011; Batista et al., 2019, Fonseca



& Borges, 2021). Therefore, it contributes to becoming a bridge between the teacher and the students, favoring the connection between theory and practice (De Moraes et al., 2016).

#### 4. Conclusion

Although the topic has been little explored by scientific research, the importance of monitoring activity for the teaching and learning process of students in the discipline of Human Anatomy is notorious. Whether in relation to the clarification of curricular knowledge in a more accessible way, either as a stimulus to teaching or even in the exchange of knowledge.

Increasingly, the need to develop innovative educational resources has been discussed where knowledge, as well as skills and attitudes, must be worked on to transform the performance of the student, whether he develops the activity or is assisted by it, for example. in monitoring activity. Making them active and reflective in the construction of their own knowledge, starting to have a critical attitude associated with an improvement in future professional and personal performance.

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