

## Competency-based education as a framework for the systematization of academic monitors instruction

### Uma sistematização da formação de monitores de ensino fundamentada na educação médica baseada em competências

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**ABSTRACT | INTRODUCTION:** The monitor is an agent of the teaching-learning process in higher education in Brazil. Teaching monitoring programs can impact the monitor's learning, the learning of monitored students, and the quality of teaching practice. However, there are few publications on this subject, with a lack of evidence indicating the best ways for monitoring to reach its potential. **OBJECTIVES:** To report the experience of planning and elaborating a systematization of the instruction of academic monitors using the principles of competency-based medical education as a framework. **EXPERIENCE REPORT:** The training of monitors was structured in three steps: 1) Identification and definition of the desired competencies; 2) Selection of activities and methodologies; 3) Evaluation. For the 1st step, technical-professional competencies and competencies for the 21st century were listed. For the 2nd step, active participation and peer collaboration activities were prioritized. For the 3rd step, moments of active listening were planned and carried out, prioritizing metacognition and self-regulation. **FINAL CONSIDERATIONS:** The systematization of a competence-based instructional path has the potential to facilitate the acquisition of knowledge, abilities, and attitudes by the academic monitor and, consequently, to bring benefits to the entire structure of higher education. Future investigative studies are needed to assess the extent of this impact.

**KEYWORDS:** Competency-Based Education. Medical Education. Mentoring.

**RESUMO | INTRODUÇÃO:** O monitor é um agente do processo de ensino-aprendizagem na educação do nível superior do Brasil. Programas de monitorias de ensino podem impactar o aprendizado do próprio monitor, o aprendizado dos alunos monitorados e a qualidade da prática docente. No entanto, são escassas as publicações sobre o tema, havendo uma carência de evidências que indiquem os melhores caminhos para que uma monitoria possa atingir o seu potencial. **OBJETIVOS:** Relatar a experiência de planejamento e elaboração de uma sistematização de formação de monitores acadêmicos tendo como referencial os princípios da educação médica baseada em competências. **RELATO DE EXPERIÊNCIA:** A formação de monitores foi estruturada em três passos: 1) Identificação e definição das competências almejadas; 2) Seleção de atividades e metodologias; 3) Avaliação. Para o 1º passo, foram elencadas competências técnico-profissionalizantes e competências para o século XXI. Para o 2º passo, foram priorizadas a participação ativa e a colaboração entre pares. Para o 3º passo, foram planejados e realizados momentos de escuta ativa, priorizando a metacognição e a autorregulação. **CONSIDERAÇÕES FINAIS:** A sistematização de uma formação baseada em competências tem o potencial de facilitar a aquisição de conhecimentos, habilidades e atitudes pelo monitor acadêmico e, conseqüentemente, de trazer benefícios a toda a estrutura do ensino superior. Estudos investigativos futuros são necessários para avaliar a dimensão desse impacto.

**PALAVRAS-CHAVE:** Educação Baseada em Competências. Educação Médica. Monitoria.

## 1. Introduction

In Brazil, the role of teaching monitors in higher education institutions is regulated, with the teaching monitor being a selected undergraduate student tasked with auxiliary technical and didactic functions for a specific discipline or course.<sup>1</sup> The specifics of the role played by the teaching monitor are determined by each institution's monitoring programs. Given the diversity of institutional pedagogical projects, it is assumed that there are varied experiences and impacts resulting from the implementation of monitoring programs with different characteristics. However, more evidence on this topic is needed, as despite the widespread incorporation of monitoring in the structure of Brazilian higher education, there is a scarcity of publications on the subject.<sup>2</sup>

Studies investigating the perception of teaching monitors have consistently found a positive view regarding the impact of monitoring on the monitor's learning. This positive impact extends to the content directly associated with the discipline, as well as the acquisition of other types of knowledge crucial for both professional development and personal growth. Some of the effects observed in these studies include overcoming emotional difficulties, gaining a more profound knowledge, and broadening social relationships.<sup>3</sup> Additionally, monitors reported experiencing in-depth learning and enhanced self-regulation of the learning process.<sup>4</sup> Furthermore, the studies highlighted the development of public speaking skills, learning teaching methods, adopting effective study habits, cultivating reading habits, and improving performance in group activities.<sup>5</sup>

Academic monitoring is frequently characterized as a process of teaching initiation.<sup>2</sup> In this context, monitors not only progress as learners but also embark on a parallel journey as instructors. Consequently, the role of the teaching monitor within the realm of monitor-student relationships can positively influence the learning experiences of the students being supervised.

A study conducted in higher education within the humanities field showed that students being monitored perceived that the assistance of monitors positively influenced the self-regulation of their learning. This included improvements in the organization of their cognitive and metacognitive processes, as well as increased motivation.<sup>4</sup>

The monitor shares proximity in age, language, and experience with the students, being immersed in their culture and having encountered the challenges inherent in the learning process that the monitored students are currently facing. This proximity is highlighted in a study<sup>6</sup> where the authors concluded that the academic monitors are closer to the students than teachers, fostering a more comfortable environment for students to ask questions and seek clarification from the monitor.

In the health field, a study reported a shift in the monitors' perception of their role after completing the monitoring program. This transformation resulted in a clearer understanding of the instructional nature of the monitor's role and its connection to a future teaching career. Additionally, monitors gained a better appreciation for the value of providing emotional support to the students they were monitoring.<sup>7</sup>

Another potential impact of the monitor's role is on the teaching practices of the discipline's professors, arising from the relationships between monitors and teachers. An investigation into the teacher's perception of the monitor's role reported that, in their opinion, the assistance of academic monitors is essential in classes with many students, enhancing the quality of the class activities and communication. Additionally, teachers mentioned that monitors contribute to discussions in the preparation of educational tools and assist in the development of new methodologies.<sup>6</sup>

However, the role of the monitor should be distinct from the role of the teacher. In a study associating monitoring with cognitive, metacognitive, and motivational improvements in students, monitors did not deliver lectures but systematized, organized, and taught strategies through which students regulated the learning of content taught by teachers in the classroom.<sup>4</sup> In this context, monitoring serves as a valuable complement to the work of teachers, contributing to the deepening of academic studies.

Thus, with a proper understanding of the distinct roles of the teacher and the monitor and the alignment of the monitoring program with the institutional pedagogical project, along with the creation of an "environment conducive to the communication and expression of ideas and feelings, as well as cooperation and mutual trust between monitors

and teachers<sup>7</sup>, a teacher can significantly benefit from the monitor's involvement. The monitor can serve as a robust connector between teachers and students, bridging relational gaps, facilitating access to individual needs and student difficulties<sup>6,7</sup>, and providing valuable insights that drive reflections and reforms in teaching practices, ultimately helping achieve learning objectives.

In this manner, the monitor becomes an integral member of the higher education organization, and monitoring has the potential to influence not only the individual development of the monitor but also the entire teaching and learning process.<sup>7</sup>

We recognize that systematizing the monitor's formative process is essential for a monitoring program to realize its full potential. Hence, the supervising teacher of an academic monitoring program plays a crucial role in planning monitoring activities to facilitate and enhance the achievement of learning objectives for students in a specific course, as well as in designing the formative pathway for monitors. This includes creating an encouraging environment rich in learning opportunities to enable monitors to develop and acquire competencies.

This paper aims to share our experience as supervising teachers in developing a competency-based systematization for the formation of academic monitors in a histology course. The author L.S.P. served as the coordinator of the histology monitoring from 2013 until the beginning of 2022. Author A.P.M held the position of vice-coordinator during this period and assumed the role of coordinator from 2022 onward. This report encompasses the experiences of the coordination team from 2013 to 2020 since there was a suspension of the in-person formative process in the period 2020-2021 due to the emergency shift to remote teaching imposed by the COVID-19 pandemic.

## 2. Contextualization

The histology teaching monitoring program has a duration of one year and is affiliated with the curricular components Functional Bio Morphology I and II (FBM I and FBM II) of the Medicine course at

a higher education institution (HEI) belonging to a private non-profit foundation in the state of Bahia, Brazil.

The monitor serves for one semester in FBM I (M1) and another in FBM II (M2), assuming responsibility for providing instructional support to students during active teaching methodologies and histological slide observation in practical classes, all under the guidance of a teacher. After one year, the monitor can choose to apply for the position of Supervisor Monitor (SM), working for an additional semester. The SM serves as a link between the monitoring coordination and the monitors M1 and M2, assisting in the instructional process and overseeing the functions of the teaching monitors.

The educational project of the higher education institution (HEI) encompasses, in addition to scientific and technological education, behaviors and attitudes guided by ethical, humanitarian, and democratic values; respect and commitment; and technical proficiency for teamwork. Active teaching methodologies are prioritized, aiming to stimulate individual intellectual autonomy and mediated self-learning. The institution has an Institutional Monitoring Program (IMP) responsible for standardizing and providing guidelines for monitoring across all seven health-related undergraduate courses. According to the IMP regulations, the objectives of teaching monitoring are to develop cognitive, procedural, and attitudinal competencies, as well as to deepen the knowledge acquired in a specific curricular component. The IMP further emphasizes that these objectives should be achieved through activities conducted in collaboration with a professor.

## 3. Experience report

### 3.1. Choice of Theoretical Foundations

The academic monitoring journey exposes teaching monitors to a variety of learning experiences. Learning can be facilitated directly by the discipline's professors, stemming from the monitor-professor relationships. Alternatively, learning can be fostered through discussions and shared experiences among peers, arising from monitor-monitor relationships,

whether through more experienced monitors guiding less experienced ones or interactions between monitors at the same formative level. Additionally, there is learning facilitated by the involvement in teaching and guidance activities conducted by the monitor with the monitored students. This process, known as learning by teaching, stems from the monitor-student relationships.

The experience of almost ten years as coordinator and vice-coordinator of a histology monitoring program has provided us with reflections and opportunities for action regarding the formative process of academic monitors. In our first two years in the coordination team, these cycles of reflection-action were guided by our perceptions and the feedback from M1, M2, and SM gathered in meetings for listening and dialogue. However, we felt the need to systematize the academic monitoring formative process and chose to use competency-based medical education (CBME) as a reference. To guide us in this systematization process, we used the consensus report developed in 2010 by the International CBME Collaborators (ICBME).<sup>8</sup>

An essential characteristic of CBME is to shift the focus from planning content and teaching methods to focusing on the competencies we aim to develop in students and then selecting content and planning activities that enhance the acquisition or improvement of these competencies.

UNESCO, the United Nations Educational, Scientific, and Cultural Organization, lists knowledge, skills, values, and attitudes among the basic needs of learning and states that education is based on four pillars: learning to know, learning to do, learning to be, and learning to live together.<sup>9</sup> The ICBME consensus report reflects this vision and states that observable competencies are the synthesis of knowledge, skills, and attitudes. The ICBME also notes that there is an excessive focus in medical education only on acquiring

knowledge and highlights the need to promote curricular restructuring to include the acquisition of skills and attitudes. The ICBME consensus report lists six steps for planning a curriculum in CBME.<sup>8</sup>

Guided by the consensus<sup>8</sup>, we synthesized and adapted the ICBME's recommended steps to the monitoring context. This resulted in outlining three steps for the systematization of the formation process of histology monitors: 1) Identification and definition of desired competencies; 2) Selection of activities, experiences, and methodologies that enhance the acquisition of these competencies; 3) Evaluation.

Another critical guiding reference we utilized was self-regulated learning.<sup>4</sup> In our roles as monitoring coordinators, we perceived that we were responsible for managing the formative process of the monitors, ensuring the creation of a space open to dialogue and cooperation. This included actively engaging monitors in the systematization of their formative process.

### **3.2. Identification and definition of desired competencies**

To structure the first step, we compiled a list of essential knowledge (K), skills (S), and attitudes (A) to be acquired or enhanced by teaching monitors. Subsequently, we created a competency matrix (Box 1). To inform this process, we referred to guiding documents such as the course syllabus, the institutional pedagogical project, the IMP guidelines, the national curriculum guidelines outlined by the Brazilian Ministry of Education for Medicine courses<sup>10</sup>, the UNESCO report "Education for Global Citizenship: Preparing Students for the Challenges of the 21st Century"<sup>11</sup>, and the competencies for the 21st century outlined by the Partnership for 21st Century Learning (P21) organization.<sup>12,13</sup>

**Box 1.** Competencies matrix

Code	Description
K1	Recognize your role and responsibilities as a teaching monitor, in alignment with the mission, vision, and values of the institution; the guidelines of the Institutional Monitoring Program; the pedagogical project of the course; and the syllabus of the academic component.
K2	Have an in-depth and comprehensive understanding of the histophysiology of human tissues and organs.
K3	Correlate histological knowledge with pathologies or medical clinical situations, contextualizing the learning of basic sciences.
K4	Recognize the structure of a light microscope, correlating it with the principles of optical microscopy.
K5	List, describe, and summarize the stages of processing for preparing slides for light microscopy, inferring visual alterations resulting from processing errors.
K6	Understand, analyze, and critique the theoretical foundations that underpin the pedagogical practices of the discipline, integrating them with scientific evidence on the subject.
K7	Understand, analyze, and critique the theoretical foundations underlying nonviolent communication and empathy in the classroom and medical practice.
S1	Use a light microscope in accordance with technical recommendations.
S2	Identify structures of human tissues and organs on histological slides.
S3	Apply the principles of nonviolent communication at work to communicate assertively and clearly.
S4	Plan, manage, and execute projects.
S5	Collaborate in teamwork with a focus on problem-solving and decision-making.
S6	Produce and/or implement digital communication technologies for education and the dissemination of scientific knowledge.
S7	Conduct oral presentations in lectures and scientific events.
A1	Act with empathy.
A2	Have a humanistic and respectful attitude.
A3	Be responsible.
A4	Have a critical and reflective attitude.
A5	Collaborate cooperatively.
A6	Demonstrate autonomy and initiative, acting with self-awareness and self-regulation.
A7	Have an innovative and creative mindset.

K, Knowledge; S, Skill; A, Attitude.

Source: the authors (2023).

### 3.3. Selection of Activities and Methodologies

Once the desired competencies were defined, the second step of the systematization was carried out: planning activities that would enable the acquisition and development of these competencies (Supplementary Box S1).

Our institution's pedagogical project is rooted in student-centered education, with participatory learning and active teaching methodologies. Therefore, we prioritized the planning of participative and collaborative activities. Whenever possible, preference was given to activities that facilitated the acquisition of both technical and non-technical competencies. This ensured that the time dedicated to acquiring non-technical competencies did not compromise the workload devoted to acquiring technical competencies. As an example, the HistoArt workshop, based on the use of art as a learning facilitator, aims to nurture attitudes such as empathy and collaboration while enhancing visual perception in studying histological slides.

### 3.4. Evaluation

The third step of the systematization involved the assessment of the implemented actions. We conducted meetings between the coordination team and the monitors at the beginning and end of each semester, aiming to gather not only expectations and needs but also perceptions and suggestions for modifying the monitoring formative activities. In addition to these two moments at the beginning and end of the academic periods, we assign the SM the role of being a source of procedural listening to the difficulties and opinions of the monitors throughout the semester. Furthermore, as a proposal for metacognitive exercise and aiming to promote self-regulated learning, the monitors are encouraged to write a self-assessment of their competencies in the learning path on attitudinal competencies in the Virtual Learning Environment (VLE) (Supplementary Box S1). They are also encouraged to plan strategies for developing or enhancing competencies.

### 4. Final considerations

The competency-based monitor formation process we have designed has three fixed steps but maintains flexibility in adjusting planned activities to achieve desirable competencies. It also allows for the insertion or modification of competencies in the matrix, making the model adaptable to the context of the monitors' needs and the curricular component's requirements.

During our nearly decade-long tenure as coordinators of teaching monitoring, where we conducted numerous selection processes, we've observed a pre-existing awareness among candidates regarding the substantial value of monitoring. They recognize its importance for acquiring or enhancing technical competencies—knowledge and skills directly linked to the discipline of histology—and how it correlates with their future professional practice as physicians. This encompasses the study and understanding of knowledge associated with the histophysiology of tissues and organs.

With the implementation of the competency-based formation process, monitors have demonstrated a more thorough understanding, not only of technical competencies but also a noteworthy development of skills essential for 21st-century professionals. These include communication, teamwork, planning, empathy, and creativity. Furthermore, there is an enhancement of competencies related to teaching practices, such as understanding and applying active teaching methodologies. We've also noticed a heightened awareness and appreciation of the importance of these non-technical competencies. Our emphasis on 21st-century skills aligns with recent publications addressing this topic in higher education.<sup>14,15</sup>

The systematization of a competency-based monitoring program has positively impacted the instruction of monitoring members and the quality of assistance provided by teaching monitors to students in the curricular component. As a critical reflection, we highlight the need to improve the third step, with the generation of more objective data on the assessment of competency acquisition. This could be achieved using reflective portfolios, applying perception questionnaires, and evaluating the acquisition of competency milestones. This step will be essential to generate evidence of the effectiveness of the monitoring instruction program, to have a better mapping of gaps and improvement opportunities, and to enable the development of personalized monitor instruction paths, as the learning process is guided by the specificities of each individual and the relationships experienced in their trajectory.

From our perspective, the competency-based systematic approach has yielded positive outcomes for both the development of the monitoring team members and the quality of assistance provided by teaching monitors to students in the curricular component. Upon critical reflection, we emphasize the need to enhance the third step by generating more objective data on competency acquisition.

This improvement can be achieved using reflective portfolios, administering perception questionnaires, and evaluating the attainment of competency milestones. This is crucial for substantiating the effectiveness of the monitor instruction program, gaining a clearer understanding of gaps and improvement opportunities, and facilitating the creation of personalized monitor instructional pathways. This is essential as the learning process is influenced by the unique characteristics of each individual and the relationships they encounter throughout their journey.

Experience reports can showcase innovative ideas, successful processes, and challenges within the realm of academic monitoring in higher education. Our aim in this report is to share our experience in utilizing CBME as a guiding framework in planning educational monitoring programs. We recognize the potential of this systematic approach to positively impact the acquisition of knowledge, skills, and attitudes by teaching monitors, thereby benefiting the entire structure of higher education.

#### Authors' contributions

Pugliese LS participated in the conception and planning of the competency-based monitoring instruction program, coordinated the execution of the proposed activities, led the evaluation meetings, and wrote the article. Moura AP contributed to the planning of the competency-based monitoring program, the execution of the proposed activities, and the critical review of the work, providing significant intellectual contributions. All authors reviewed and approved the final version and agreed with its publication.

#### Conflicts of Interest

No financial, legal, or political conflicts involving third parties (government, companies, private foundations, etc.) have been declared for any aspect of the submitted work, including but not limited to grants and funding, participation in advisory boards, study design, manuscript preparation, statistical analysis, etc.

#### Indexers

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## Supplementary file

**Box S1.** Activities (to be continued)

Activity	Description	Competency	References
<i>Jigsaw</i>	In the selection process for the monitoring program, candidates take part in a workshop facilitated by the coordination. During the workshop, there is an activity using the cooperative active methodology "jigsaw," involving the reading and discussion in teams of foundational texts about the institutional mission, vision, and values; non-violent communication; the role of the teaching monitor; and active teaching methodologies.	K1, K6-7 S3, S5 A1-3, A5	[SR1]
<i>Wiki</i>	The monitors collaboratively develop a wiki on human tissues and organs' histological and functional aspects. It is updated each semester by new monitors and should be written in the form of indirect citation, including bibliographic references and highlighting agreements and disagreements among authors.	K2, K3 S5 A3-6	[SR2]
HistoArt Workshop	The monitors participate in a workshop facilitated by the monitoring coordination team, focusing on the themes of medicine in art, art in medicine, and what we can learn from art about visual perception in histology.	S2, S5 A1-5, A7	[SR3], [SR4]
Slides seminar	In the first stage, the monitors individually study the virtual histological slides selected by the professors. Subsequently, M1 monitors present, to M2 monitors and professors, some histological slides chosen by lottery. This involves identifying histological structures and making morphofunctional correlations.	S2-3, S7 A3, A6	[SR5]
Evaluation board for the slide seminar	The M2 monitors assess the presentation of the M1 monitors.	K6 S3 A1-4	[SR5], [SR6], [SR7]
Learning path in microscopy and histological processing.	In the virtual learning environment, monitors follow a learning path with videos and texts on light microscopy, handling a light microscope, and histological processing.	K4-5 A3	[SR8], [SR9]
Light Microscopy Workshop	The monitors participate in a workshop with monitoring coordination to learn about the structure and operation of the	S1-2	[SR3]

**Box S1.** Activities (conclusion)

Activity	Description	Competency	References
	light microscope in the microscopy laboratory and the visualization of slides.		
Visit the clinical pathology laboratory	The monitors schedule visits to the institution's clinical pathology laboratory to observe the stages of histological processing of biopsies from patients treated.	K4-5 A3, A6	[SR3]
Workshop on active teaching methodologies	Discussion of scientific articles and engagement in cooperative activities on active teaching methodologies.	K6 A4-7	[SR3], [SR6], [SR7]
Learning path on attitudinal competencies	In the virtual learning environment, monitors follow a learning path with videos and texts on emotional intelligence, non-violent communication, mirror neurons, empathy, and empathy fatigue.	K7 A1-4, A6-7	[SR8], [SR9]
<i>GBL</i>	The monitors participate in creating games, planning, and monitoring a teaching activity using the Game-Based Learning methodology to instruct students in the discipline on the histological aspects of epithelial and connective tissues.	K2, K6 S4-7 A1-3; A5-7	[SR10], [SR11]
Development or mediation of quizzes using digital platforms	The monitors contribute to the development and/or facilitate the use of ICT tools such as Kahoot, Socrative, and Mentimeter;	S6 A3-7	[SR10], [SR11], [SR12]
Social network management	The monitors create cards and challenges for use on the monitoring program's Instagram profile and manage the profile. Monitors also form groups on the WhatsApp application to provide extra-class support to the students.	S5-6 A6-7	[SR6], [SR7]
Scientific sessions	Selection, presentation, and discussion of scientific articles on histology.	K2 S3, S7 A3-4, A6	[SR5], [SR6], [SR7]
HistoMED Conference	They plan an extension event with invited expert medical speakers to correlate histological knowledge with professional practice. The academic supervisor or M2 monitors present the opening lecture. Monitors are responsible for choosing the theme, inviting guest speakers, contributing to the event registration process with the Extension Department, and promoting the event.	K2, K3 S3-5, S7 A3-7	[SR13], [SR14]
Instructional support	The monitors play a role in instructional support during practical classes for the course, assisting the instructor in implementing their lesson plan, clarifying doubts, and monitoring students as they engage in activities with active teaching methodologies.	K2, K6 S2-3 A1-3, A5-6	[SR6], [SR7]

\*The selection of activities described was collectively built and improved over several semesters and planning-implementation-evaluation cycles. K, knowledge; S, skill; A, attitude; SR., supplementary reference.

Source: the authors (2023).

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