

## Role of the proactive attitude in evaluating ultrasonography competence of the Imaging Technologist

Rol de la actitud propositiva en la evaluación de competencia  
ultrasonográfica del tecnólogo de imagenología

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### ABSTRACT

**Background:** the evaluation of ultrasonography professional competence across healthcare levels requires recognizing the active role of the Imaging Technologist. Strengthening its interpretation and development demands the integration of technological knowledge with a proactive attitude, in order to assess performance through traits that underpin the process and results of the evaluation.

**Objective:** to explain how the incorporation of the Imaging Technologist's proactive attitude contributes to the evaluation of ultrasonography professional competence across healthcare levels.

**Methods:** a descriptive study with a qualitative-interpretive approach was conducted at healthcare levels in Havana between February 2022 and January 2024. Theoretical methods were applied: systematization, conceptual triangulation, and inductive-deductive analysis; empirical methods: documentary analysis of professional performance reports, supervision or tutoring records, and written reflections from the technologist. Information was processed through categorization and systematization, and comparative tables of national research and evaluative dimensions of the proactive attitude were developed.

**Results:** it was found that the proactive attitude constitutes concrete evidence in the evaluation of ultrasonography competence. The actions that express it manifest a transformative intentionality in professional performance, and therefore should be considered in both the process and the results of the evaluation.

**Conclusions:** the proactive attitude links continuous performance improvement, resolution of healthcare problems, methodological innovation, and ethical-social commitment. These findings integrate the proactive attitude as a cross-cutting criterion in the training, evaluation, and professional development of the Imaging Technologist across healthcare levels.

**MeSH:** professional competence; professional development; allied health personnel; education, medical.

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## RESUMEN

**Fundamento:** la evaluación de la competencia profesional ultrasonográfica en los niveles de atención en salud requiere reconocer el papel activo del tecnólogo en Imagenología.

Fortalecer su interpretación y desarrollo demanda articular saberes tecnológicos con actitud

propositiva, para valorar el desempeño mediante rasgos que sustentan el proceso y resultados de la evaluación.

**Objetivo:** explicar cómo la incorporación de la actitud propositiva del tecnólogo de Imagenología contribuye a la evaluación de la competencia profesional ultrasonográfica en los niveles de atención en salud.

**Métodos:** se realizó una investigación descriptiva con enfoque cualitativo- interpretativo en los niveles de atención de salud en La Habana entre febrero 2022-enero 2024. Se aplicaron métodos teóricos: sistematización, triangulación conceptual e inductivo- deductivo; empíricos: análisis documental de informe del desempeño profesional, registros de supervisión o tutoría y reflexiones escritas del tecnólogo. La información fue procesada mediante categorización y sistematización, se elaboraron tablas comparativas de investigaciones nacionales y dimensiones evaluativas de la actitud propositiva.

**Resultados:** se constató que la actitud propositiva constituye evidencia concreta en la evaluación de la competencia ultrasonográfica. Las acciones que la expresan manifiestan una intencionalidad transformadora de la actuación profesional, por lo que deben considerarse en el proceso y en los resultados de la evaluación.

**Conclusiones:** la actitud propositiva vincula la mejora continua del desempeño, la resolución de problemas asistenciales, la innovación metodológica y el compromiso ético- social. Estos hallazgos integran la actitud propositiva como criterio transversal en la formación, evaluación y desarrollo profesional del tecnólogo de Imagenología en los niveles de atención en salud.

**DeCS:** competencia profesional; superación profesional; técnicos medios en salud; educación médica.

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## INTRODUCTION

The evaluation of professional competencies in medical education, and particularly in the area of health technology, is conceived as a process that prioritizes skill development and the inclusion of a propositive attitude.<sup>(1)</sup>

The propositive attitude can be understood as the constant disposition of a person to generate ideas, propose alternatives, and contribute solutions in any context. It is characterized by creativity, innovation, and ethical commitment. In this study, it is differentiated from the proactive attitude described in the literature by emphasizing the capacity to formulate concrete proposals that enrich professional practice.<sup>(2)</sup> This interpretation, linked to Miller's Pyramid, evidences that when accessing ultrasonographic professional competencies, a progressive mastery oriented towards knowing how to do with expertise is consolidated.

These considerations are significant in the area of ultrasonography, where professional performance demands mastery of practice-action and a critical attitude with commitment towards continuous improvement.<sup>(3,4)</sup> In this context, the present study has the objective: to explain how the incorporation of the propositive attitude of the Imaging Technologist contributes to the evaluation of ultrasonography professional competence at healthcare levels.

## METHODS

A descriptive study with a qualitative-interpretive approach was conducted at the three healthcare levels in the city of Havana, between February 2022 and January 2024. The population consisted of 150 Imaging Technologists. An intentional and homogeneous sample was selected, made up of professionals graduated from the same study plan and with five or more diplomas and/or training certificates in diagnostic ultrasound. The participants belonged to three municipalities of Havana and represented 20 % of the total population considered in the study.

Consequently, the following theoretical-level methods were employed:

- Systematization: previous experiences and theoretical knowledge related to the role of the Imaging Technologist at healthcare levels were organized and reflected upon.
- Conceptual triangulation: various theoretical and conceptual perspectives were integrated to enrich the understanding of the field of action, which favors interpretative validity.
- Systemic-structural-functional: the propulsive attitude was analyzed as part of a dynamic professional system, in which functions, structure, and relationships within the healthcare context were identified.
- Inductive-deductive: started from particular observations about professional performance to build theoretical generalizations, and contrasted these with established conceptual frameworks.

The propulsive attitude was considered within a dynamic, systemic, transformative, and integrative evaluative process, oriented towards initiative, creativity, and flexibility in the exercise of the profession. This avenue of analysis allows for assessing how this attitude contributes to the fulfillment of the basic functions of the Imaging Technologist at healthcare levels.

Empirical method:

Documentary analysis: Professional performance reports, supervision or tutoring records, and written reflections of the technologist are included. Records generated during the professional performance of the Imaging Technologist were incorporated for the study. These documents were considered as direct evidence of the practice-action process in real healthcare contexts. The analysis allowed for identifying concrete expressions of the propulsive attitude, as well as the fulfillment of basic functions at the three healthcare levels.

In this interpretive process, the propulsive attitude emerged as an analytical category, as it was recurrently evidenced in the reviewed documents. It was not predefined but revealed itself as a significant component in the professional performance of the technologist, which

enabled enriching the theoretical understanding in the evaluation of ultrasonographic professional competence.

Ethical considerations: confidentiality of the records used was guaranteed, and the ethical principles of documentary analysis in professional contexts were respected.

## RESULTS AND DISCUSSION

In the bibliographic review conducted, six Cuban investigations were identified, observable in Table 1, which address the development of the professional competence of the Imaging Technologist from theoretical, methodological, and practical approaches. This evidence allows for contextualizing the object of study and recognizing the propoitive attitude as an emerging category linked to the process and outcome of ultrasonography professional performance.

**Table 1.** Cuban investigations on the professional competence of the Imaging Technologist (2021–2025)

No.	Authors and title of the research	Year	Contribution to the interpretation and evaluation of competence	Contribution of the Propoitive attitude to competence evaluation
1	Suárez OJ, Alonso AO, Solís SS. Professional performance of the imaging technologist in gynecological ultrasound for minimally invasive surgery	2021	Defines specific technical skills in surgical contexts	Points out the need for greater initiative in high-demand environments
2	Castro Pérez M, Pérez Pérez SM. Evaluation model for the research competence of the Bachelor in Imaging	2023	Proposes an evaluation model with a systemic approach	Integrates creativity, analysis, and autonomy as attitudinal components
3	González Basulto MJ, García Rodríguez J, Malpica Mederos AJ. Environmental education and radiological protection for Medical Imaging and	2023	Assesses ethical and technical training in students of the program.	Reinforces responsibility, critical awareness, and initiative as an expression of

	Radiophysics students.		.	professional commitment
4	Cabello Daza S, Hernández Chisholm D, Gutiérrez Vera D, Díaz Rodríguez CR. Self-perception and performance in ultrasonography professional competencies of the medical imaging technologist.	2024	Assesses competencies through questionnaires and observation guides.	Strengthens a proactive attitude as a key indicator of competence, reflecting initiative, commitment, and adaptability.
5	Rodríguez Dinza HF, Álvarez Medina O, Valdés Pérez GL, Hormigó Puertas IF. Relationship between the performance of orbital ultrasound technologists and the quality of ophthalmological services.	2025	Systematizes operating procedures in ultrasound.	Recognizes initiative and responsibility as essential traits for improving service quality
6	Machado Acuña F, Olivares Paizan G, Solano Pérez M, Moll Varela S. Theoretical considerations on the pedagogical competencies of Medical Imaging and Radiophysics instructors.	2025	Analyzes pedagogical training as a foundation for the professional development of the technologist.	Links teacher training with initiative and flexibility in professional practice.

Source: literature review

Table 1 presents a synthesis of studies that, beyond assessing professional performance, recognize within it attitudinal components linked to initiative, creativity, flexibility, and commitment. These essential elements were used to understand how a proactive attitude manifests in professional practice and how it can be incorporated as a process and outcome criterion in evaluating ultrasonography professional competence across levels of healthcare.

The comparison among the studies reveals that, although each research addresses different dimensions of professional competency, all agree in highlighting the relevance of a proactive attitude in the technologist's performance. This is expressed through initiative, creativity, flexibility, and commitment, observable in both technological and educational contexts.

The study by Cabello Daza *et al.*<sup>(5)</sup> highlights how professional commitment is reflected in the discrepancy between self-perception and actual performance, suggesting that a

proactive attitude can be a key indicator in evaluation. Meanwhile, Rodríguez Dinza *et al.*<sup>(6)</sup> reinforce this idea by linking initiative and responsibility to the quality of service in orbital ultrasound. In both studies, the proactive attitude is associated with continuous performance improvement, evidencing an active disposition of the technologist to review, adjust, and perfect their practice. This dimension is strengthened through feedback processes, both internal and external, which allow for identifying opportunities for improvement and making value judgments about the level of competency achieved.

In both studies, the proactive attitude is associated with continuous performance improvement, thereby evidencing an evaluation process that guides the development of organizational capacities, adaptability, and decision-making. The importance of evaluating modes of practice that reveal social commitment, professional autonomy, and an ethical and pertinent response to environmental demands is recognized.<sup>(7,8)</sup> These studies demonstrate that a proactive attitude is not only developed in professional practice but can also be cultivated from the training stage.

Finally, the competency evaluation model developed by Castro Pérez *et al.*<sup>(9)</sup> incorporates attitudinal dimensions such as creativity and analysis, reinforcing the relevance of considering a proactive attitude as a criterion in evaluating ultrasonography professional competence.

The interpretive proposal developed in the present research shows that a proactive attitude not only complements professional performance but also guides decision-making, problem-solving, and adaptation to diverse contexts. By integrating attitudinal components into the evaluation process, the understanding of professional competency as a dynamic construct that articulates knowledge, skills, and ethical dispositions is broadened.

The study by Suárez Ocegüera *et al.*<sup>(10)</sup> offers a characterization of performance in the context of gynecological ultrasound for minimally invasive surgery. Although the orientation is predominantly technological, it is evident that initiative and adaptability are essential for guaranteeing service quality, which allows linking that performance to concrete expressions of a proactive attitude in professional practice.

Delgado Fernández, *et al.*<sup>(11)</sup> conceive competencies in clinical ultrasound interpretation as a framework of scientific knowledge, practical skills, professional attitude, values, and emotions, aimed at optimizing the performance of the intensive care physician and the care of critically ill patients. This integral view reaffirms that a proactive attitude stands as an inseparable component and is consolidated as a structural part of professional competency. By highlighting the need for accreditation and certification, it is recognized that this attitude must be considered alongside technological knowledge, supporting its incorporation as a cross-cutting criterion in the training and evaluation processes of the Imaging Technologist.

Another study, "The evaluation of competencies in professional training from a learning outcomes-based approach",<sup>(12)</sup> argues that systematizing the evaluation of professional competencies from this viewpoint allows for establishing achievement levels that facilitate better adaptation of training to the demands of job performance. This perspective adds an organizational dimension to the evaluation process, in which a proactive attitude can be considered an observable and measurable indicator. By incorporating this attitude into achievement levels, a more contextualized evaluation is favored, one that recognizes initiative, flexibility, and commitment as concrete expressions of professional performance in real healthcare scenarios.

The training of the Imaging Technologist demands a pedagogical approach that prepares them as an agent of change mobilization, capable of undertaking formative evaluation with an instructive, educational, and developmental character.<sup>(13)</sup> In this sense, a proactive attitude manifests as an active disposition to transform professional practice, adapt to environmental challenges, and propel methodological innovations.

The conscious incorporation of digital technologies into the educational process, as part of professional competencies, demands a critical, flexible, and collaborative profile, which surpasses the traditional teacher-centered model and promotes students' cognitive independence. These characteristics consolidate a proactive attitude as a cross-cutting axis in the training and evaluation of professional performance.<sup>(14)</sup>

Delgado Fernández *et al.*<sup>(15)</sup> in this second intention, directs attention towards recognizing the multiple benefits generated by mastery of competencies in sonography or ultrasonography. These are based on the application and execution of technological procedures in this area of knowledge, which favors the management, prognosis, and decision-making for patients with complex clinical situations within the health-disease process. This scenario evidences a proactive attitude characterized by a high level of care-related updating and capacity to respond to the challenges of the professional environment.

Based on the analysis conducted, key dimensions in evaluating ultrasonographic professional competency that evidence the proactive attitude of the Imaging Technologist are identified. These dimensions, linked to performance in real-world scenarios, are synthesized in Table 2 as part of the process and outcome of the planned objectives in the evaluation.

**Table 2.** Evaluative dimensions of the proactive attitude of the Imaging Technologist

Evaluated dimension	Evaluated dimension	Evaluated dimension
Assistance/Healthcare Updating	Assistance/Healthcare Updating	Assistance/Healthcare Updating
Decision-Making	Decision-Making	Decision-Making
Initiative in complex cases, diagnostic proposals	Initiative in complex cases, diagnostic proposals	Initiative in complex cases, diagnostic proposals
Ultrasound in emergency settings	Ultrasound in emergency settings	Ultrasound in emergency settings

Source: Compiled by the authors based on obtained results and consulted references

The presented evaluative dimensions are directly linked to the role of the proactive attitude in the professional performance of the Imaging Technologist, as evidenced by various recent studies. Machado Acuña *et al.*<sup>(16)</sup> for example, propose that it is possible to integrate healthcare, research, managerial, and ethical functions within the work context, supported

by continuous education and bioethical principles. This approach is reinforced by revealing ethical attitude as an essential component in professional training. Similarly, emphasis is placed on the idea that these criteria involve the harmonious integration of knowledge, skills, and character, enabling professional practice aligned with current educational demands.<sup>(17,18)</sup>

Cabrales Fuentes<sup>(19)</sup> and Machado *et al.*<sup>(20)</sup> indicate that comprehensive training in medical diagnostic imaging should promote work-related qualities such as responsibility, creativity, independence, and argumentative ability, which are directly linked to indicators for timely technological decision-making, proposal of improvements, and collaborative interaction. This reinforces the necessity of a proactive attitude on the part of the technologist, capable of integrating emerging tools into professional practice.

The integration of results and documentary evidence allows for establishing a set of interpretive regularities that synthesize the most significant expressions of proactive attitude in professional practice, among which are:<sup>(20)</sup>

1. The proactive attitude manifests as initiative to solve complex problems, evidencing autonomy in the application and execution of ultrasonography technological procedures in real healthcare scenarios.
2. Creativity and critical analysis are recognized as recurring expressions of the proactive attitude, guiding technological decision-making and the continuous improvement of professional performance.
3. Professional flexibility is recognized in the willingness to adapt to changing contexts, allowing the technologist to integrate new tools and methodologies into practice.
4. Ethical-social commitment is expressed in the responsibility assumed regarding service quality, consolidating the proactive attitude as a structural component of the professional role.
5. The proactive attitude is strengthened through formative feedback processes, enabling the review, adjustment, and perfection of professional performance from a reflective perspective.

6. The disposition to lead and collaborate in multidisciplinary teams reveals a proactive attitude oriented towards collective work, effective communication, and the integration of knowledge.
7. The proactive attitude is developed from the training stage, cultivated through pedagogical approaches that promote cognitive independence, argumentation, and innovation.
8. The evaluation of professional competency should incorporate observable and measurable attitudinal indicators, such as initiative, responsiveness, and proposal of improvements, to comprehensively assess performance.
9. The proactive attitude articulates technological knowledge, practical skills, and ethical dispositions, configuring a dynamic, contextualized, and humanistic professional competency.

The systematization of these regularities enables the construction of interpretive criteria that enrich the training and evaluation processes of the Imaging Technologist across healthcare levels.

#### Scientific contribution

The scientific contribution of this research is expressed in the incorporation of the definition of proactive attitude as an evaluative dimension within ultrasonography professional competence. This approach emphasizes the capacity to generate concrete proposals that enrich professional practice and strengthen the performance of the Imaging Technologist. Consequently, it broadens the theoretical frameworks of medical education, particularly in the field of health technology, and offers an innovative tool for competency evaluation at different levels of healthcare.

## CONCLUSIONS

Collectively, the reviewed studies allow us to argue that the proactive attitude constitutes an evaluable dimension of the ultrasonography professional competence of the Imaging Technologist. Its incorporation into evaluation processes strengthens the link between the

efficient use of biomedical technology, the fulfillment of basic functions, and the quality of professional practice across healthcare levels.

## BIBLIOGRAPHICAL REFERENCES

1. Ramos-Zaga F. Transformando la educación médica del siglo XXI: El rol de la educación médica basada en competencias. *Rev Fac Med Hum* [Internet]. 2024 [citado 07/09/2025];24(1):169-178. Disponible en: [http://www.scielo.org.pe/scielo.php?script=sci\\_arttext&pid=S230805312024000100169&lng=es](http://www.scielo.org.pe/scielo.php?script=sci_arttext&pid=S230805312024000100169&lng=es)
2. Comité Editorial Revista Ocronos. La clave de una actitud proactiva en el entorno sanitario. *Rev Ocronos* [Internet]. 2025 [citado 07/09/2025];8(5):487-95. Disponible en: <https://revistamedica.com/clave-actitud-proactiva-entorno-sanitario>
3. Andrea Giamberardino N, Eduardo Felipe A. Rasgos de profesionalidad médica en el ámbito de la atención primaria: respeto por la autonomía. *EDUMECENTRO* [Internet]. 2023 [citado 06/09/2025]; 15: [aprox. 5 p.]. Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S207728742023000100086&lng=es](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S207728742023000100086&lng=es)
4. Betancourt Plaza I, Véliz Martínez PL, Mezquía de Pedro N. Acercamiento teórico a la evaluación de competencias profesionales gerenciales en Medicina Intensiva y Emergencias. *Educ Med Super* [Internet]. 2023 [citado 06/09/2025];37(4): [aprox. 3 p.]. Disponible en: <http://scielo.sld.cu/scielo.php?script=sciarttext&pid=S0864-21412023000400015&lng=es>
5. Cabello Daza S, Hernández Chisholm D, Gutiérrez Vera D, Díaz Rodríguez CR. Autopercepción y desempeño en competencias profesionales ultrasonográficas del tecnólogo de imagenología. *Rev Cubana Med Milit* [Internet]. 2024 [citado 08/09/2025];53(4):e024055012. Disponible en: <https://revmedmilitar.sld.cu/index.php/mil/article/view/55012>
6. Rodríguez Dinza HF, Álvarez Medina O, Valdés Pérez GL, Hormigó Puertas IF. Relación entre el desempeño de los tecnólogos en ecografía orbitaria y la calidad de los servicios oftalmológicos. *Rev Cubana Oftalmol* [Internet]. 2025 [citado 09/09/2025];38: [aprox. 12 p.]. Disponible en: <https://revoftalmologia.sld.cu/index.php/oftalmologia/article/view/1864>

7. Machado Acuña F, Olivares Paizan G, Solano Pérez M, Moll Varela S. Consideraciones teóricas sobre las competencias pedagógicas de los docentes de Imagenología y Radiofísica Médica. Rev Inf Cient [Internet]. 2025 [citado 08/09/2025];104:e4693. Disponible en: <https://revinfcientifica.sld.cu/index.php/ric/article/view/4693>
8. González Basulto MJ, Batista Mestre D. Desarrollar habilidades en estudiantes de Licenciatura en Imagenología y Radiofísica Médica desde la asignatura Radioterapia. EDUMECENTRO [Internet]. 2025 [citado 09/09/2025];17:[aprox. 14 p.]. Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S207728742025000100020&lng=en](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S207728742025000100020&lng=en)
9. Castro Pérez Maily, Pérez Pérez Silvia María. Modelo de evaluación de la competencia investigativa del licenciado en Imagenología. EDUMECENTRO [Internet]. 2023 [citado 09/09/2025];15:[aprox. 14 p.]. Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S207728742023000100111&lng=es](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S207728742023000100111&lng=es)
10. Suárez Ocegüera J, Alonso Ayala O, Solís Solís S. Desempeño profesional del tecnólogo en imagenología en ultrasonido ginecológico para la cirugía de mínimo acceso. Rev. Cub. Tecnol. Salud. [Internet]. 2021 [citado 09/09/2025];12(1):138-44. Disponible en: <https://revtecnologia.sld.cu/index.php/tec/article/view/1930>
11. Delgado Fernández RI, Ruiz Hernández A, Lauzán Carnota O, Baldassarri Navarrete IZ. Competencias en ecografía clínica, una necesidad inaplazable para los cuidados intensivos. EDUMECENTRO [Internet]. 2023 [citado 19/10/2025];15:[aprox. 14 p.]. Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S207728742023000100092&lng=es](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S207728742023000100092&lng=es)
12. Nieto Ortiz J, Cacheiro González ML. La evaluación de las competencias en la formación profesional desde un enfoque basado en los resultados de aprendizaje. RIO [Internet]. 2021 [citado 19/10/2025];(27):173-96. Disponible en: [https://www.revista-rio.org/index.php/revista\\_rio/article/view/353](https://www.revista-rio.org/index.php/revista_rio/article/view/353)
13. Vargas Quispe G, Sito Justiniano LM, Toledo Espinoza SL, Toledo Espinoza ES, Mendoza Hidalgo ML. Evaluación formativa y las tecnologías del aprendizaje y conocimiento [Internet]. Rev Univ Soc [Internet]. 2022 [citado 20/10/2025];14(1):339-48. Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S2218-36202022000100339](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2218-36202022000100339)
14. Merino-Obando P, Recalde-Gracey A. Avances y tendencias en tecnologías inteligentes para la gestión del sistema de salud. Gestio et Productio [Internet]. 2024 [citado 20/10/2025];6(11):[aprox. 5 p.]. Disponible en: [https://ve.scielo.org/scielo.php?script=sci\\_arttext&pid=S273900392024000200068](https://ve.scielo.org/scielo.php?script=sci_arttext&pid=S273900392024000200068)

15. Delgado Fernández RI, Hernández Ruiz A, Ramírez Rodríguez P. Competencias en ecografía clínica en tiempos de COVID-19, una cuenta pendiente para los intensivistas. *Rev Cuba Med Tropical* [Internet]. 2024 [citado 20/10/2025];76:[aprox. 4 p.]. Disponible en: <https://revmedtropical.sld.cu/index.php/medtropical/article/view/987>
16. Machado Acuña F, Burgal Cintra CJ, Solano Pérez M, González Oliva A. La profesionalización para el perfeccionamiento de las competencias pedagógicas de los docentes de imagenología y radiofísica médica. *Uleam Bahia Magazine* [Internet]. 2025 [citado 21/10/2025];6(11):78-87. Disponible en: [https://revistas.uleam.edu.ec/index.php/uleam\\_bahia\\_magazine/article/view/80](https://revistas.uleam.edu.ec/index.php/uleam_bahia_magazine/article/view/80)
17. Medina Gamero A. Actitud ética en la formación profesional médica. *Educ Med* [Internet]. 2024 [citado 21/10/2025];25(3):[aprox. 3 p.]. Disponible en: <https://www.elsevier.es/es-revista-educacion-medica-71-articulo-actitud-etica-formacion-profesional-medica-S1575181324000275>
18. Olivares-Paizán G, Travieso-Ramos N, González-García TR, Novo-Rodríguez E. La actuación profesional como dimensión de la profesionalización docente en la Educación Médica. *Maestro y Sociedad* [Internet]. 2021 [citado 20/10/];18(3):848–859. Disponible en: <https://maestroysociedad.uo.edu.cu/index.php/MyS/article/view/5380>
19. Cabrales Fuentes J. Maestría en diagnóstico por imágenes médicas en consecuencia de la nueva era de las bioimágenes. *CCM* [Internet]. 2025 [citado 20/10/2025];29: e5201. Disponible en: <https://revcocmed.sld.cu/index.php/cocmed/article/view/5201>
20. Machado A, Vega V, Olivares P, Solano P. La superación profesional a través del modelo de profesionalización de las competencias pedagógicas en Imagenología. *Rev Educ Cienc Salud* [Internet]. 2024 [citado 20/10/2025];21(2):164–170. Disponible en: <https://dialnet.unirioja.es/servlet/articulo?codigo=9833918>

#### **Declaration of interests**

The authors declare no conflict of interest.

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