

Overview article

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Comparing the objective and program learning outcomes of Medical Imaging Technology training program of Pham Ngoc Thach University of Medicine with other's

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Abstract

This report compares the objective and program learning outcomes of bachelor's program in Medical Imaging Technology between Pham Ngoc Thach University of Medicine and two domestic universities and one internationally accredited program. The report aims to identify similarities and differences that make each program unique. Additionally, the report seeks to highlight the strengths and limitations of this program at Pham Ngoc Thach University as a reference for developing a new program. This also serves as a practical basis for the university to gain insights into the current quality of education compared to other institutions within and outside the country. This will facilitate the development of plans to enhance the quality of education in accordance with the program's expected outcomes for the bachelor of Medical Imaging Technology program.

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1. INTRODUCTION

In Vietnam, as well as worldwide, higher education is increasingly concerned with improving quality to meet the ever-changing societal demands. The quality of university education is a crucial foundation for the development of every nation. Comprehensive approach to enhance the quality of university education focuses on infrastructure, developing scientific research capabilities, improving lecturer competency, improving teaching and learning quality. However, the development of educational programs also relies on various factors such as the volume of specialized knowledge and the time allocated for each course.

Therefore, the article aims to compare objective and program learning outcomes (PLOs) of Decision No. 2261/QĐ-TĐHYKPNT issuing the program learning outcomes for the Bachelor of Medical Imaging

Technology Training Program of Pham Ngoc Thach University of Medicine in 2020 [3] with other universities. The article will provide information to aid in the development and adjustment of the training programs at Pham Ngoc Thach University of Medicine.

2. LITERATURE REVIEW

2.1. Training program of Pham Ngoc Thach University of Medicine

Pham Ngoc Thach University of Medicine offers a Bachelor of Medical Imaging Technology Training Program over a duration of 4 years, comprising a total of 135 credits. The program structure includes:

General education component, consisting of compulsory courses such as Physical Education, National Defense Education, Philosophy, Foreign Languages and Computer Skills, as well as elective courses totaling two credits.

Professional education component, which encompasses three parts: foundational knowledge of the field, specialized knowledge, and elective specialized knowledge. Students have the option to choose elective specialized courses as substitutes for the graduation thesis.

2.2. Training program comparison

2.2.1. Objectives comparison

Table 1. Objectives of 4 university

| University | Objectives |
|---|---|
| Pham Ngoc Thach University of Medicine [3] | The Bachelor of Medical Imaging Technology Training Program at Pham Ngoc Thach University of Medicine aims to cultivate students with political integrity, professional ethics, and good health, equipped with specialized competence, research skills, international integration capabilities, and meet the needs of protecting, caring and improving the health of the people. |
| University of Medicine and Pharmacy at Ho Chi Minh City [6] | The Bachelor of Medical Imaging Technology Training Program instills values, a sense of service to the community, as well as knowledge and practical skills in the field of Medical Imaging Technology at the university level. Students are equipped with health, independence, creativity, self-learning, and research abilities to meet the needs of protecting, caring for, and enhancing the health of the people. |
| Hue University Of Medicine and Pharmacy [4] | The Bachelor of Medical Imaging Technology Training Program emphasizes ethical values and provides fundamental scientific knowledge, basic medical knowledge, as well as specialized knowledge and skills in the field of Medical Imaging Technology at the university level. Students are equipped with the ability to work independently, creatively, and to engage in self-learning and scientific research to meet the needs of protecting, caring for, and enhancing the health of the people. |
| Curtin University (Australia) [7] | The Bachelor of Medical Imaging Technology Training Program provides students with knowledge and skills corresponding to AQF level 7. It prepares students to develop advanced knowledge and skills for professional work, research, and further study corresponding to AQF level 8. |

Fundamentally, the training objectives of the universities are similar, but the expression differs in the sentences. In Vietnam, universities focus on the professions and industries that students will undertake after their training. The training objectives of universities in Australia differ from those in Vietnam, particularly in terms of training according to the AQF level 7 standard, which is equivalent to a bachelor’s degree in Australia. The AQF (Australia Qualifications Framework) in Australia is designed to

strengthen the national qualifications system, including secondary qualifications, vocational education and training, and higher education, postgraduate education, with ten levels, from level 1 being the lowest and level 10 being the highest. Among them, the first four levels are Certificate, Diploma which has three levels: Diploma (level 5), Advanced Diploma (level 6), and Graduate Diploma (level 8), bachelor’s degree (level 7), master’s degree (level 9), and the highest is Doctoral degree (level 10). Most

universities in Vietnam have comprehensive training objectives, aiming to educate technicians with ethics and skills in both work and scientific research. The objective of Curtin University (Australia) is to graduate students with bachelor's degrees and prepare them with the knowledge for further academic research at the master's level.

2.2.2. Program Learning Outcomes

The PLOs of a training program are a set of standards regarding the education and results of the training process that learners must achieve upon completion of the program [1]. PLOs include indicators of the qualities, knowledge, skills, and work competencies that learners acquire after completing the training program. PLOs are of great significance in guiding both learners and educators, managing, and establishing the objectives that need to be achieved during the teaching and learning process.

The PLOs of Pham Ngoc Thach University of Medicine, Ho Chi Minh City University of Medicine and Pharmacy, and Curtin University exhibit similarities. Despite variations in the training programs corresponding to each set of PLOs, the institutions consistently ensure that students, upon graduation, possess comprehensive knowledge and competencies in their respective fields of work.

Delving deeper into comparing the four Medical Imaging Technology training programs, we observe several similarities and differences as follows:

The presentation format of Pham Ngoc Thach University of Medicine, Ho Chi Minh City University of Medicine and Pharmacy, and Curtin University is quite similar. All three universities organize their PLOs in a structured manner. On the other hand, the PLOs of Hue University of Medicine and Pharmacy are more concise, presented in three categories: knowledge, skills, and self-reliance and responsibility competencies. While this concise format is easier for readers to understand and aligns closely with the National Framework

for Higher Education issued in 2016 [2], it may pose challenges during the accreditation process. Clearly outlining each PLOs helps readers better understand the program and facilitates the quality assurance process.

The number of PLOs varies among the programs: Pham Ngoc Thach University of Medicine has the highest number of learning outcomes (14 PLOs), while Hue University of Medicine and Pharmacy has the fewest, condensed into 3 categories. Curtin University and Ho Chi Minh City University of Medicine and Pharmacy have the same number of learning outcomes (9 PLOs and 10 PLOs, respectively). This indicates that graduates from these three universities acquire similar skills, meeting the recruitment needs of workplaces after graduation. Although the number of learning outcomes differs among the programs, all ensure that graduates meet the necessary requirements, including language skills, philosophy, information technology, as well as specialized knowledge and skills.

In terms of content, both Pham Ngoc Thach University of Medicine and Ho Chi Minh City University of Medicine and Pharmacy ensure learning outcomes related to language and computer skills. All universities focus on imparting knowledge, communication and interpersonal skills, and professional ethics to students. However, Pham Ngoc Thach University of Medicine provides more detailed and explicit content in these areas.

To provide readers with a clearer understanding of the PLOs of each university, we conduct an analysis of the differences between Pham Ngoc Thach University of Medicine and other universities as follows:

In the PLOs of Ho Chi Minh City University of Medicine and Pharmacy, proficiency in language skills is identified as PLO8, that are appropriate with Pham Ngoc Thach University of Medicine for PLO2 and PLO3. This concise notation allows readers to identify the standards that students are expected to achieve. However, Pham Ngoc Thach University of Medicine

provides a clearer explanation of the criteria for each language and computer skill that students must attain at the university level as stipulated [5]. Both universities' training programs exhibit similarities, differing in the interpretation of wording, yet encompassing all the skills that students acquire upon graduation.

In the PLOs of Curtin University, although there are no specific PLOs related to language and computer skills, the skills required for work, professional knowledge, and communication in the profession are quite similar to those outlined in Pham Ngoc Thach University of Medicine. All three institutions, Pham Ngoc Thach University of Medicine, Ho Chi Minh City University of Medicine and Pharmacy, and Curtin University, are concerned with ensuring that students acquire fundamental knowledge, specialized knowledge, departmental management, and professional ethics, all of which are clearly stated in the PLOs of each university. Of utmost importance is the emphasis on scientific research and evidence-based practice during both domestic and international learning experiences, as reflected in PLO10 of Pham Ngoc Thach University of Medicine, PLO1 of Ho Chi Minh City University of Medicine and Pharmacy, and PLO1 of Curtin University.

Although the PLOs of Hue University of Medicine and Pharmacy are concise, they still

encompass all the skills that students acquire upon graduation. Regarding knowledge, students are required to have a comprehensive understanding of general knowledge, basic and specialized knowledge in the field, as well as language and computer skills, similar to PLO1, PLO2, PLO3, PLO4 of Pham Ngoc Thach University of Medicine. In terms of skills, there is a slight difference compared to the other three universities. Hue University of Medicine and Pharmacy focuses on developing critical thinking and problem-solving skills. As for self-reliance and responsibility competencies, all four universities train graduates to work independently and collaboratively, take responsibility in their work, and prioritize professional ethics.

Despite differences in wording and presentation style, the PLOs of Ho Chi Minh City University of Medicine and Pharmacy and Curtin University are quite similar to those of Pham Ngoc Thach University of Medicine. This indicates that graduates of Medical Imaging Technology programs have a consistent set of skills, aligning with the development trends in our country. This indicates that graduates of Medical Imaging Technology programs are required to possess consistent skills that align with the development trends in our country.

Table 2. Program Learning Outcome of 4 universities

| Pham Ngoc Thach University of Medicine [3] | University of Medicine and Pharmacy at Ho Chi Minh City [6] | Hue University of Medicine and Pharmacy [4] | Curtin University (Australia) [7] |
|---|---|---|--|
| PLO1: Capable of applying the basic principles of Marxism-Leninism. | | General knowledge according to the framework of Hue University. | |
| PLO2: Capable of presenting the revolutionary path of the Communist Party of Vietnam and the ideology of Ho Chi Minh. | | | |
| PLO3: Capable of updating the policies of the Party and the State. | | | |
| PLO4.1: Capable of understanding the main ideas in simple conversations, lectures, and presentations by foreign speakers. | | | |
| PLO4.2: Capable of handle most situations that may arise in communication. | | Has skills in | |
| PLO4.3: Capable of use simple connecting sentence in familiar topics in daily life or related to personal interests. | | logical reasoning and problem-solving. | |
| PLO5.1: Capable of using specialized documents in English. | PLO8: Effectively utilize English language and information technology for work, study, and research purposes. | | |
| PLO5.2: Capable of utilize sources written in English | | | |
| PLO6.1: Capable of applying basic IT knowledge to use a computer and the Internet at a basic level. | | Has problem-solving skills. | |

| Pham Ngoc Thach University of Medicine [3] | University of Medicine and Pharmacy at Ho Chi Minh City [6] | Hue University of Medicine and Pharmacy [4] | Curtin University (Australia) [7] |
|--|---|--|---|
| <p>PLO6.2: Capable of process documents, use presentation software, and utilize spreadsheets at a basic level.</p> | | <p>Possesses professional skills.</p> | |
| <p>PLO6.3: Capable of utilize specialized application software on various computer systems.</p> | | <p>Self-reliance and personal responsibility, autonomy and responsibility in the profession.</p> | <p>PL01: Apply discipline knowledge to undertake medical imaging procedures in a safe and effective manner; develop clinical practices using evidence-based research</p> |
| <p>PLO7.3: Capable of approach patients and health issues in a scientific, honest, responsible, compassionate, and equitable manner.</p> | <p>PLO10: Medical practice in accordance with legal regulations and professional ethical standards.</p> | | <p>PL02: Think critically and reflectively about factors for safe and effective patient outcome delivery including clinical information, physical parameters, and patient, equipment and environmental conditions</p> |
| <p>PLO8.1: Capable of take responsibility for individual decisions regarding professional.</p> | | | <p>PL09: Work effectively, ethically and cognisant of medico-legal boundaries within the interprofessional healthcare team; take responsibility for own actions</p> |
| <p>PLO8.2: Always prioritize the safety and rights of patients.</p> | | | <p>PL07: Demonstrate cognisance of current international standards and practices within the profession and apply these clinically</p> |
| <p>PLO8.3: Medical practice within the scope of licensure, adherence to professional regulations, and suitability for health conditions.</p> | | | |

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|---|---|---|---|
| <p>Pham Ngoc Thach University of Medicine [3]</p> | <p>University of Medicine and Pharmacy at Ho Chi Minh City [6]</p> | <p>Hue University of Medicine and Pharmacy [4]</p> | <p>Curtin University (Australia) [7]</p> |
| <p>PLO8.4: Consciousness and implementation of medical confidentiality as regulated.</p> | | | <p>PLO9: Work effectively, ethically and cognisant of medico-legal boundaries within the interprofessional healthcare team; take responsibility for own actions</p> |
| <p>PLO7.1: Respect the economic conditions, customs, traditions, beliefs, religions, and cultures of each region and individual.</p> | | | <p>PLO9: Work effectively, ethically and cognisant of medico-legal boundaries within the interprofessional healthcare team; take responsibility for own actions</p> |
| <p>PLO7.2: Commit to working according to prescribed standards, ethical principles, and taking responsibility for professional decisions.</p> | | | <p>PLO8: Manage patient care in a manner that promotes respect for individuals, is socio-culturally sensitive and ethically appropriate.</p> |
| <p>PLO9: Medical practice according to legal regulations.</p> | | | <p>PLO9: Work effectively, ethically and cognisant of medico-legal boundaries within the interprofessional healthcare team; take responsibility for own actions</p> |
| <p>PLO10: Lifelong learning for personal and professional development.</p> | <p>PLO9: Develop the capacity for lifelong self-directed learning.</p> | | <p>PLO6: Assess and critically evaluate information independently to remain informed and advance practice</p> |

| Pham Ngoc Thach University of Medicine [3] | University of Medicine and Pharmacy at Ho Chi Minh City [6] | Hue University of Medicine and Pharmacy [4] | Curtin University (Australia) [7] |
|---|--|--|--|
| <p>PLO11.1: Explaining the structure, function, and interaction between structure and function under normal conditions.</p> | <p>PLO1: Apply fundamental scientific knowledge, basic medical knowledge, field-specific foundations, and specialized knowledge into practical professional practice in the field of medical imaging technology.</p> | <p>General knowledge in the field of training, general knowledge on field.</p> | <p>PL01: Apply discipline knowledge to undertake medical imaging procedures in a safe and effective manner; develop clinical practices using evidence-based research</p> |
| <p>PLO11.2: Explaining basic engineering principles, applying fundamental medical knowledge and specialized knowledge to professional work.</p> | <p>PLO4: Perform nuclear medicine and radiation therapy techniques proficiently.</p> | | |
| <p>PLO12.1: Capable of performing imaging techniques: X-rays, Computed Tomography, Magnetic Resonance Imaging as regulated by the Ministry of Health.</p> | | | |
| <p>PLO12.2: Capable of develop in the direction of Nuclear Medicine - Radiotherapy.</p> | | | |
| <p>PLO12.3: Capable of understand the functions of specialized machinery in order to utilize them effectively and safely in professional work.</p> | | | <p>PL05: Use equipment/instrumentation knowledge and available clinical information to assess the medical imaging procedure required to appropriately address the clinical challenge/question, recognising the advantages and limitations of available equipment/instrumentation to provide a safe and effective patient outcome</p> |
| <p>PLO12.4: Basic capable of detect and respond to radiological incidents in medical radiography.</p> | | | |

| Pham Ngoc Thach University of Medicine [3] | University of Medicine and Pharmacy at Ho Chi Minh City [6] | Hue University of Medicine and Pharmacy [4] | Curtin University (Australia) [7] |
|---|--|---|---|
| PLO12.5: Basic capable of handle situations related to side effects when performing techniques involving contrast agents. | | | |
| PLO12.6: Capable of evaluate images that meet technical and professional requirements. | | | PLO1: Apply discipline knowledge to undertake medical imaging procedures in a safe and effective manner; develop clinical practices using evidence-based research |
| PLO12.7: Capable of use and maintain specialized equipment. | | | |
| PLO12.8: Capable of detect and describe common pathological images on radiographs. | | | |
| PLO12.9: Capable of screen and prioritize diseases (emergency conditions, severe illnesses, elderly patients, children, etc.) in professional practice. | | | PLO3: Apply an inquiring approach to the management of patients and the assessment of medical imaging procedure requirements and outcomes through identification, access, evaluation and synthesis of information from credible sources |
| PLO12.10: Capable of provide feedback to leadership on issues related to department management and advise on equipment needs for Imaging Technology. | PLO5: Capable of self-assess job performance and propose improvement solutions to enhance the efficiency of technical processes. | | |

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|---|--|---|---|
| <p>Pham Ngoc Thach University of Medicine [3]</p> <p>PLO13: Capable of communicate effectively with patients and their families.</p> <p>PLO14: Capable of communicate and coordinate effectively with colleagues to serve in patient care.</p> | <p>University of Medicine and Pharmacy at Ho Chi Minh City [6]</p> <p>PLO6: Participate in organizing and managing the diagnostic imaging department.</p> <p>PLO7: Participate in training imaging technicians at lower levels and other relevant groups, conducting scientific research and evidence-based practice.</p> | <p>Hue University of Medicine and Pharmacy [4]</p> | <p>Curtin University (Australia) [7]</p> <p>PLO4: Communicate effectively and appropriately with different workplace, healthcare and patient groups, taking into account age, health condition and socio-cultural background</p> |
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3. CONCLUSION

The PLOs of the Bachelor of Imaging Technology programs at Pham Ngoc Thach University of Medicine, Ho Chi Minh City University of Medicine and Pharmacy, and Hue University of Medicine and Pharmacy all comply with state regulations, ensuring that students acquire the necessary skills to become professionals. Although the presentation styles of the four universities differ, they all succinctly summarize the content that students will achieve upon graduation. However, clearly outlining the PLOs are best for readers.

The presentation of the PLOs at Pham Ngoc Thach University of Medicine still lacks conciseness, user-friendliness, and clarity. Therefore, the Medical Imaging Technology program at the university should be updated and revised according to the National Qualifications Framework for Higher Education [5], aiming to enhance the quality of Bachelor of Medical Imaging Technology training domestically and internationally.

ABBREVIATIONS

AFQ: Australian Qualifications Framework
PLO: Program Learning Outcome

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