

Challenges, Adaptability, and Confidence of Radiologic Technology Interns in Pacs Utilization in Clinical Practice

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Abstract

The increasing complexity of diagnostic imaging in healthcare delivery has driven the adoption of advanced technologies, such as the Picture Archiving and Communication System (PACS). While PACS enhances image management and clinical workflow, it also presents technical, usability, instructional, and psychological challenges for student interns. Adaptability plays a key role in enabling students to manage these demands, influencing their confidence and overall performance in clinical practice. This study employed a descriptive-correlational design to examine radiologic technology interns' perceived challenges, levels of adaptability, and confidence in PACS utilization, as well as the relationships among these variables. Findings revealed that interns experience notable challenges in using PACS, accompanied by low levels of adaptability and confidence. A strong negative relationship was identified between perceived challenges and both adaptability and confidence, indicating that increased challenges are associated with lower adaptability and confidence. Conversely, adaptability and confidence were found to have a strong positive relationship. The study concludes that training-related and psychological challenges significantly affect interns' adaptability and confidence in PACS use. Addressing these issues through structured training, hands-on practice, and consistent support systems is essential to enhancing students' competence and confidence. Strengthening these areas can improve clinical performance and better prepare interns to use PACS effectively in professional practice.

Keywords: Challenges, Adaptability, Confidence, Radiologic Technology Interns, PACS Utilization

Introduction

The increasing number of patients and the wide range of disease conditions have made healthcare delivery more complex, prompting the adoption of advanced technologies. One key innovation in diagnostic imaging is the Picture Archiving and Communication System (PACS), which enables digital image processing, efficient workflow, and hands-on clinical experience for both professionals and student interns (Henry, 2025). Through PACS, radiologic technology interns develop technical skills, adhere to safety protocols, and adapt to real-world clinical environments.

Despite its advantages, PACS presents several challenges for student interns. Technical issues such as system delays, software malfunctions, and limited workstation access can disrupt workflow (O'Connor, 2021). Usability concerns, including complex interfaces and imaging tools, may hinder efficiency (Canguit & Sison, 2025). In addition, the lack of structured training often leads students to rely on self-directed learning, which limits skill acquisition and reduces confidence. Previous studies have identified persistent barriers in PACS utilization, including inadequate training, limited technical expertise, and infrastructural constraints such as unstable power supply and poor network connectivity (Lobi et al., 2025). Low computer literacy and resistance to new technologies may further reduce user engagement, leading to difficulties with system navigation and workflow integration.

Adaptability is essential in managing these challenges, as it enables students to adjust cognitively and emotionally to technology-driven environments, bridging theoretical knowledge and clinical application (Raeburn, 2025). Furthermore, it involves both cognitive-technological and affective dimensions, enabling students to adjust their thinking strategies and regulate emotions when using complex systems. Studies indicate that technological skills, user perceptions, and confidence significantly influence adaptability in PACS utilization (Kelkay et al., 2024).

Confidence, in particular, plays a critical role in effective system use. It supports accurate navigation, minimizes errors, and enhances responsiveness to clinical demands (Rosales-Márquez et al., 2025). Moreover, confidence develops through repeated exposure and experience, with more experienced users demonstrating greater competence in integrating imaging technologies into clinical workflows (York et al., 2023). This highlights the importance of structured training and hands-on experience in building both competence and self-assurance among interns.

However, a clear gap exists in the literature, as no research has examined radiologic technology interns' perceived challenges, adaptability, and confidence in using PACS in clinical practice. Additionally, the correlation between these variables has not been comprehensively investigated in the context of PACS utilization. This study addresses this gap by examining these variables and their relationships during clinical practice. The findings provide a basis for developing an evidence-based intervention plan to reduce challenges and enhance interns' adaptability and confidence in PACS use.

Methods

The study utilized a descriptive-correlational approach to determine perceived challenges, levels of adaptability, and confidence in PACS utilization among radiologic technology interns, while examining relationships among variables without manipulation. Data were gathered from 78 radiologic technology interns enrolled during the second semester of the 2025–2026 academic year in selected higher education institutions in Laguna and Batangas, including the University of Perpetual Help—Dr. Jose G. Tamayo Medical University, Calamba Doctors' College, and Lyceum University of the Philippines—St. Cabrini School of Health Sciences Inc. Using a Raosoft sample size calculator, 78 respondents were selected from a total population of 97 through stratified random sampling technique with proportional allocation to ensure representative distribution of respondents across the participating institutions.

A self-structured questionnaire was used, consisting of three sections: Part I determined the perceived challenges, Part II examined the level of adaptability, and Part III measured the level of confidence in PACS utilization, assessed using a four-point Likert scale. The instrument underwent expert review to ensure consistency and content adequacy. Reliability testing using pilot data demonstrated excellent internal consistency, with Cronbach's alpha of 0.976 for challenges, 0.940 for adaptability, and 0.966 for confidence.

Data collection was conducted through a mixed approach of online and on-site survey distribution following institutional approval. Participation was voluntary, and confidentiality and anonymity were strictly maintained. Completed responses were reviewed, organized, and prepared for statistical analysis. A weighted mean was used to describe the variables, and Pearson's correlation coefficient was used to assess relationships among perceived challenges, levels of adaptability, and confidence.

Results and Discussion

A discussion on the relevant data gathered on the perceived challenges and levels of adaptability, and confidence in PACS utilization is presented below:

Table 1

The Respondents' Perceived Challenges in PACS Utilization: Technical Challenges

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. PACS image loading and retrieval function efficiently during routine clinical use	2.77	Major Challenge	4
2. PACS operates smoothly without freezing or crashing during assigned tasks.	3.00	Major Challenge	1
3. Available workstations support efficient PACS use through processing speed, display quality, and input devices.	2.94	Major Challenge	2
4. Network connectivity allows uninterrupted access to PACS images and patient records.	2.91	Major Challenge	3
5. The technical performance of PACS supports continuity of assigned clinical tasks.	2.65	Major Challenge	5
General Weighted Mean	2.85	Major Challenge	

Legend: (Strongly Disagree/Major Challenge — 4, Disagree/Minor Challenge — 3, Agree/Moderate Challenge — 2, Strongly Agree/Not a Challenge — 1)

Table 1 presents the perceived challenges encountered by the respondents in PACS utilization during clinical internships in terms of technical factors. The findings indicate that respondents generally disagreed with all indicators, suggesting that major technical challenges were perceived during clinical use. Among the indicators, indicator 2, which is the challenge in system responsiveness, ranked first, with a weighted mean of 3.00. This was followed by indicator 3, workstation availability, with a score of 2.94, ranking second. Next,

indicator 4, network connectivity issues, had a weighted mean of 2.91, ranking third. Indicator 1, image loading and retrieval, ranked fourth with a weighted mean of 2.77, while technical performance on tasks ranked last as indicator 5 with a weighted mean of 2.65.

The results suggest that the radiologic technology interns perceived major technical challenges in utilizing PACS, with an average weighted mean of 2.85. This indicates that radiologic technology interns experienced system unresponsiveness or instability, such as frequent freezing or system crashing, which emerged as the most prominent issue affecting users and can disrupt workflow, reduce efficiency, and potentially affect the quality and timeliness of patient care.

Frequent freezing, crashing, or unresponsiveness of the PACS was a significant challenge during clinical tasks. These disruptions can interrupt the image review, data entry, and case processing, leading to delays in patient management. In clinical settings where accuracy and efficiency are essential, such system failures can increase user frustration and may require repetition of tasks or system troubleshooting (Hashim et al., 2026).

Table 2.

The Respondents' Perceived Challenges in PACS Utilization: Usability

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Locating specific patient studies or imaging series within the PACS interface is easy.	2.72	Major Challenge	2
2. Managing and reviewing multiple imaging studies or series in PACS is manageable.	2.68	Major Challenge	3.5
3. PACS tools for image review and manipulation are easy to use during clinical practice.	2.68	Major Challenge	3.5
4. The layout and organization of PACS menus, icons, and tools are intuitive.	2.90	Major Challenge	1
5. Image adjustments (e.g., windowing, zooming, measurements, or annotations) can be performed efficiently in clinical practice.	2.51	Major Challenge	5
General Weighted Mean	2.70	Major Challenge	

Legend: (Strongly Disagree/Major Challenge — 4, Disagree/Minor Challenge — 3, Agree/Moderate Challenge — 2, Strongly Agree/Not a Challenge — 1)

Table 2 presents the perceived challenges respondents encountered in PACS utilization during clinical internships, focusing on system usability. The findings indicate that radiologic technology interns generally disagreed with the indicators and identified major challenges with PACS usability experienced during clinical internship. The highest-ranked perceived challenge was indicator 4, intuitiveness of PACS layout and organization, rated with a weighted mean of 2.90. This was followed by indicator 1, ease of use within the PACS

interface, ranked second with a weighted mean of 2.72. Indicators 2 and 3, which are the PACS' ability to manage and review, as well as the ease of use of the PACS tool for image review and manipulation, shared a rank of 3.5 with a weighted mean of 2.68. And lastly, indicator 5, that is, image adjustment efficiency, was also perceived as difficult during clinical use, with a weighted mean of 2.51, ranked fifth.

Overall, the average weighted mean for usability was 2.70, indicating that radiologic technology interns perceived major challenges with PACS usability during their clinical internship. In particular, the unintuitive layout and organization of menus, icons, and tools suggest that the system's interface design significantly affects workflow efficiency, forcing users to invest extra time and effort to navigate the system and access patient studies effectively.

When the interface is not intuitive, students and practitioners may struggle to navigate the system efficiently, leading to delays in locating patient studies or accessing essential tools. This can increase cognitive load, cause frustration, and potentially impact the accuracy and timeliness of image review and clinical decision-making. A poorly organized interface can hinder learning, as users spend more time figuring out system functions rather than focusing on image interpretation and skill development. (Oladapo-Oyebode et al. 2025)

Table 3.

The Respondents' Perceived Challenges in PACS Utilization: Training Challenges

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Hands-on training using actual PACS workstations is sufficient for developing practical skills.	2.76	Major Challenge	4
2. There are adequate opportunities to practice PACS tasks under direct supervision.	2.92	Major Challenge	3
3. Instructions on PACS workflows are consistently provided during clinical training.	3.01	Major Challenge	1
4. The allocated training time for learning PACS functions is sufficient to achieve confidence and accuracy.	2.96	Major Challenge	2
5. Feedback and guidance from supervising staff during PACS use support skill improvement.	2.67	Major Challenge	5
General Weighted Mean	2.86	Major Challenge	

Legend: (Strongly Disagree/Major Challenge — 4, Disagree/Minor Challenge — 3, Agree/Moderate Challenge — 2, Strongly Agree/Not a Challenge — 1)

Table 3 presents the perceived training challenges encountered by the respondents in PACS utilization during clinical internships. All indicators were disagreed upon, indicating that the respondents experienced several major challenges in this area. Indicator 3, workflow instruction consistency, ranked first with a weighted mean of 3.01. Followed indicator 4,

training time sufficiency, which ranked second with a weighted mean of 2.96. Indicator 2, supervised practice opportunities, ranked third with a weighted mean of 2.92. Meanwhile, indicator 1, hands-on training sufficiency, ranked fourth, with a weighted mean of 2.76. Lastly, indicator 5, supervisor feedback support, ranked fifth with a weighted mean of 2.67.

Overall, the average weighted mean of 2.86 suggests that radiologic technology interns perceived major training challenges, which were attributed to limited or inadequate instruction in PACS workflow during their clinical internship.

Effective PACS utilization was further limited by instructional challenges. Inconsistent provision of instructions on PACS workflows during clinical training poses a challenge for students. Trainees and new hires may not receive formal, systematic training on PACS workflow use in many clinical settings. Alternatively, others could rely on independent study or unsupervised advice from peers. Without clear guidance on tasks such as image retrieval, review, and basic manipulation, learners may struggle to develop confidence and competence, leading to errors, delays, and reduced efficiency in the work field. (Rita et al., 2024). These findings are further supported by the notion that inadequate training and system support can significantly hinder effective PACS utilization, ultimately affecting workflow efficiency and user performance in clinical environments (Abbas & Singh, 2019).

Table 4

The Respondents' Perceived Challenges in PACS Utilization: Psychological Challenges

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Exploring unfamiliar PACS functions is supported by adequate guidance.	2.85	Major Challenge	3
2. PACS-related tasks can be performed without excessive concern about errors in image handling or patient records.	2.82	Major Challenge	4
3. PACS-related technical difficulties are manageable during clinical work.	2.99	Major Challenge	1
4. High patient volume facilitates effective stress management during PACS-related tasks.	2.91	Major Challenge	2
5. Time pressure during clinical duties allows maintained focus when using PACS.	2.72	Major Challenge	5
General Weighted Mean	2.86	Major Challenge	

Legend: (Strongly Disagree/Major Challenge — 4, Disagree/Minor Challenge — 3, Agree/Moderate Challenge — 2, Strongly Agree/Not a Challenge — 1)

Table 4 presents the perceived psychological challenges encountered by the respondents in PACS utilization during clinical internships. The findings revealed that the radiologic technology interns disagreed on all indicators, indicating that major psychological challenges were indeed perceived during clinical practice. Among the indicators, indicator 3, manageability of technical difficulties, ranked first with a weighted mean of 2.99. This was followed by indicator 4, stress management during high patient volume, with a weighted

mean of 2.91, ranking second. Next, indicator 1, adequacy of guidance in exploring unfamiliar PACS functions, obtained a weighted mean of 2.85, ranking third. Indicator 2, confidence in performing tasks without concern for errors, ranked fourth with a weighted mean of 2.82, while indicator 5, maintaining focus under time pressure, ranked last with a weighted mean of 2.72.

Overall, the average weighted mean of 2.86 indicates that radiologic technology interns perceived major psychological challenges, particularly in managing technical issues, which contributes to increased stress and may affect their ability to use PACS effectively.

When users encounter system problems such as system delays, errors, or unfamiliar functions and are unable to manage effectively, these situations become significant challenges for the users. Poor management of such issues leads to increased pressure, reduced focus, and increased hesitation in performing tasks, which will affect workflow continuity and accuracy. (Radsourc, 2025)

Table 5

Summary Table of the Respondents' Perceived Challenges in PACS Utilization

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Technical Challenges	2.85	Major Challenge	3
2. Usability Challenges	2.70	Major Challenge	4
3. Training Challenges	2.86	Major Challenge	1.5
4. Psychological Challenges	2.86	Major Challenge	1.5
General Weighted Mean	2.82	Major Challenge	

Table 5 shows the respondents' perceived challenges in using PACS during clinical internships. All four indicators fall within the high range, indicating that respondents perceived considerable major challenges across these areas. The highest-ranked perceived challenges were training and psychological challenges, with weighted means of 2.86 and 2.85, respectively, followed by technical (2.85) and, lastly, usability (2.70).

The overall weighted mean of 2.82 indicates that radiologic technology interns perceived major challenges in training and psychological factors when using PACS during clinical internships. Interns experienced difficulties due to insufficient instructions on PACS workflows and technical problems that were often unmanageable, hindering the respondents' ability to use the system effectively during clinical work.

Inconsistent provision of PACS workflow instruction poses a significant challenge for students. According to Rita et al. (2024), when full instruction and information about system processes are lacking, learners often rely on independent study or unsupervised peer advice, which may be incomplete or inaccurate. This lack of structured guidance affects the development of competence and can lead to errors, delays, and reduced efficiency in the clinical setting.

Furthermore, these challenges are further compounded by repeated exposure to unresolved technical issues. As emphasized by the Radsourc (2025) system, delays, errors, or unfamiliar functions require a quick and accurate response. However, without effective coping strategies, users are more likely to hesitate and make mistakes.

Table 6

The Respondents' Level of Adaptability in PACS Utilization: Cognitive-Technological Adaptability

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Quickly adjust to changes or updates in the PACS system.	2.31	Low	6
2. Able to learn new PACS features with minimal difficulty.	2.67	High	1
3. Easy to adapt to PACS workflow when system settings or interfaces differ.	2.33	Low	4.5
4. Able to apply previously learned PACS functions effectively when faced with new clinical tasks.	2.50	High	3
5. Continues using PACS efficiently despite minor system or interface changes.	2.33	Low	4.5
6. Troubleshoots basic PACS issues without interrupting workflow.	1.95	Low	10
7. Transfers PACS skills learned in one clinical area to another.	2.24	Low	7
8. Independently explores and understands new PACS tools or features.	2.14	Low	8
9. Modifies PACS techniques to meet different clinical imaging requirements	2.53	High	2
10. Quickly regains efficiency after encountering PACS-related errors or difficulties.	2.13	Low	9
General Weighted Mean	2.31	Low	

Legend: (Strongly Agree/Very High — 4, Agree/High — 3, Disagree/Low — 2, Strongly Disagree/Very Low — 1)

Table 6 shows respondents' level of cognitive-technological adaptability to PACS in clinical practice. The radiologic technology interns were highly adaptable to the following indicators. The highest ranking among all indicators was indicator 2, adaptability while learning new PACS features with minimal difficulty, gaining a weighted mean of 2.67. Next was indicator 9, modifying PACS techniques to meet different clinical imaging needs, ranked 2nd with a mean of 2.53, and finally, indicator 4, applying previously learned PACS functions well while facing new clinical tasks, had a mean of 2.50, ranking 3rd. Meanwhile, indicators

with lower adaptability were indicator 4, being able to adapt to PACS workflow even when system settings or interfaces change, and indicator 5, being able to keep using PACS effectively even when system or interface changes are small; both received a weighted score of 2.33, ranking 4.5. Indicator 1, the ability to quickly adjust to changes or updates in the PACS system, ranked 6 with a weighted mean of 2.31. Indicator 7, transferring PACS skills learned in one clinical area to another, had a weighted mean of 2.24, ranking 7th; indicator 8, which independently explored and understood new PACS tools or features, had a weighted mean of 2.14, ranking 8th. Indicator 10, ranked 9, quickly regains efficiency after making PACS-related mistakes or having trouble, gaining a mean of 2.13. Lastly, the lowest-ranked indicator was indicator 6, troubleshooting basic PACS issues without stopping work, with a weighted mean of 1.95.

The overall weighted mean of 2.31 indicated a low level of cognitive-technological adaptability among radiologic technology interns. Although interns showed some ability to learn and apply new PACS features, limitations in troubleshooting, adapting to system changes, and independently exploring tools suggest that their adaptability is insufficient for effective, independent use in clinical practice.

It aligns with the idea that adaptability in PACS use is essential for maintaining efficiency during system updates, interface changes, and evolving clinical demands, as users must continuously adjust workflows and master new features to avoid disruptions in imaging services (Mpatisi Lobi et al., 2025). Adapting quickly to PACS updates demonstrates willingness to learn and flexibility in meeting technological demands. Since PACS are frequently updated for performance and security, adaptable users can efficiently adjust workflows and master new features. This adaptability helps maintain efficiency and accuracy for the effective use of digital imaging technologies in clinical practice (Abhari, 2025). In addition, effective PACS utilization requires users to integrate prior knowledge with new system functionalities, as cognitive flexibility enables smoother transitions when encountering unfamiliar interfaces or updated workflows, thereby improving overall performance in clinical imaging environments (Lee et al., 2023).

Table 7

The Respondents' Level of Adaptability in PACS Utilization: Affective Adaptability

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Use AI tools receptively to support thinking and decision-making when adapting to new PACS workflows.	2.35	Low	7
2. Respond positively to guidance from supervisors or staff when adapting to unfamiliar PACS tasks.	2.85	High	3
3. Remain open and adaptable to previously demonstrated PACS workflows while gradually exploring new features independently.	2.97	High	2
4. Demonstrates openness in using PACS functions and adapts effectively after receiving instructions or confirmation.	2.83	High	4

5. Being receptive to structured guidance through step-by-step instructions when learning new PACS functions.	3.00	High	1
6. Do not feel overwhelmed when learning new PACS functions.	2.04	Low	10
7. Able to control anxiety when using PACS in time-pressured situations.	2.23	Low	8
8. Motivated to continue learning even when PACS tasks are challenging.	2.79	High	5
9. Able to recover emotionally and continue working after making errors while using PACS.	2.17	Low	9
10. Adapt emotionally when transitioning from classroom learning to clinical PACS use.	2.67	High	6
General Weighted Mean	2.59	High	

Legend: (Strongly Agree/Very High — 4, Agree/High — 3, Disagree/Low — 2, Strongly Disagree/Very Low — 1)

Table 7 presents the level of affective adaptability of the respondents in utilizing PACS during clinical internships. Indicators with a high level of adaptability were the following: Indicator 5, being receptive following structured guidance through step-by-step instructions when learning new PACS functions, gained a weighted mean of 3.00, followed by indicator 3, remaining open and adaptable to previously demonstrated workflows rather than exploring PACS features independently, which gained a weighted mean of 2.97 and ranked in 2nd place; indicator 2, ranking 3rd, responded positively to guidance from supervisors or staff when adapting to unfamiliar PACS tasks, had a weighted mean of 2.85, followed closely by indicator 4, ranking 3rd, demonstrating openness in using PACS functions and adapting effectively after receiving instructions or confirmation, and had a mean of 2.83; and indicator 8, remaining motivated to continue learning even when PACS tasks are challenging, had a weighted mean of 2.79 and ranked 5th. Last on the high-ranked indicator was indicator 10, adapting emotionally when transitioning from classroom learning to clinical PACS use, with a weighted mean of 2.67. Indicators with a low level of adaptability include indicator 1, use of AI tools receptively to assist thinking and decision-making, ranked 7, with a mean of 2.35. Indicator 7, the ability to control anxiety in time-pressured situations (2.23), ranks 8th. Indicator 9 was placed in 9th rank; the ability to recover emotionally and continue working after errors got a weighted mean of 2.17, and lastly, the lowest-ranked indicator, indicator 6, not feeling overwhelmed when learning new PACS functions, garnered a 2.04 weighted mean.

The overall weighted mean of 2.59 indicates that radiologic technology interns were highly adaptable, receptive to structured guidance and step-by-step instructions when learning new PACS functions, which supports their ability to manage affective demands during clinical practice.

The importance of emotional regulation in PACS utilization where managing stress and anxiety during system-related challenges enables users to maintain focus and continue performing tasks effectively despite difficulties encountered in clinical settings (Noonan,

2025). In addition, users who demonstrate openness to guidance and structured instruction tend to adapt more effectively to technological systems, as supportive learning environments reduce anxiety and improve confidence during task performance (Savio et al., 2025).

Table 8

Summary Table of the Respondents' Level of Adaptability in PACS Utilization

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Cognitive-Technological Adaptability	2.31	Low	2
2. Affective Adaptability	2.59	High	1
General Weighted Mean	2.82	Low	

Table 8 presents a summary of the respondents' level of adaptability in utilizing PACS during clinical practice. Among the two indicators, affective adaptability had the highest weighted mean of 2.59, ranking 1st and indicating high adaptability. In contrast, cognitive-technological adaptability yielded a weighted mean of 2.31, ranking 2nd and indicating a low level.

The overall weighted mean of 2.45 indicates a low level of adaptability in PACS utilization among radiologic technology interns. While interns demonstrate a high level of affective adaptability through willingness to learn and follow instructions, this was insufficient for effective system use. Limited cognitive-technological adaptability restricts respondents' ability to understand and independently apply PACS functions, resulting in low overall adaptability in clinical practice.

Individuals who are motivated but lack a deeper understanding may perform well in structured settings but struggle in real clinical situations that require independence. Adaptation to PACS goes beyond following guided instructions; it also involves interpreting workflows, troubleshooting issues, and making informed decisions. Without this skill, users may become dependent on guidance and struggle to handle unfamiliar tasks or system variations (Altun et al., 2025).

Table 9

The Respondents' Level of Confidence in PACS Utilization: Technical Confidence

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Confident in navigating the PACS interface to perform assigned clinical tasks.	2.26	Low	5
2. Able to retrieve accurately and review patient images using PACS.	2.23	Low	6
3. Confident in performing basic image manipulation tasks (e.g., windowing, zooming, and measurements) using PACS.	2.35	Low	2
4. Confident in locating assigned cases or studies within the PACS system.	2.28	Low	4

5. Able to use PACS tools correctly while following institutional imaging workflows.	2.54	High	1
6. Confident in adjusting PACS display settings to optimize image viewing.	2.21	Low	7
7. Efficiently use PACS features without frequent assistance from others.	2.29	Low	3
General Weighted Mean	2.31	Low	

Legend: (Strongly Agree/Very High — 4, Agree/High — 3, Disagree/Low — 2, Strongly Disagree/Very Low — 1)

Table 9 presents respondents' level of technical confidence, ranked from highest to lowest. Among all indicators, only the highest-ranked indicator, indicator 5, was confident in using PACS tools correctly while following institutional imaging workflows, got a high weighted mean of 2.54, and was vertically interpreted as high. This is followed by indicators with low verbal interpretation. Indicator 3, performing basic image manipulation tasks, ranked 2nd with a weighted mean of 2.35, followed by 3rd in the rank, indicator 7, efficiently using PACS features without frequent assistance, which gained a weighted mean of 2.29. Other low-rated indicators include indicator 4, locating assigned cases or studies (2.28, Rank 4); indicator 1, navigating the PACS interface (2.26, Low, Rank 5); indicator 2, retrieving and reviewing patient images accurately (2.23, Low, Rank 6); and indicator 6, adjusting PACS display settings to optimize image viewing (2.21, Low, Rank 7).

The overall weighted mean for technical confidence of radiologic technology interns was 2.31, interpreted as "low." Despite most indicators being low, the high confidence in correctly using PACS tools and following workflows helps justify and slightly elevate the overall mean. This suggests that while radiologic technologist interns can reliably perform tasks when guided by workflows, confidence in independent and more technical aspects of PACS remains limited.

According to Craig et al. (2024), when professionals are provided with step-by-step instructions or guided demonstrations, they can perform tasks accurately and reliably, even with limited prior experience with the technology. It serves as a scaffold, allowing users to build confidence. However, individuals often excel in structured environments but lack confidence when required to act autonomously.

Table 10

The Respondents' Level of Confidence in PACS Utilization: Clinical Application Confidence

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Confidently apply PACS functions learned during training to actual clinical situations.	2.47	Low	4
2. Able to use PACS effectively while managing time constraints during clinical work.	2.13	Low	7
3. Confident in maintaining accuracy when handling multiple imaging cases in PACS.	2.19	Low	3
4. Integrate PACS use smoothly into the routine clinical workflow.	2.63	High	1
5. Confident in using PACS during regular clinical duties.	2.62	High	2
6. Confident in using PACS during high-workload or busy clinical shifts.	2.29	High	5
7. Maintain effective PACS use even when clinical demands increase unexpectedly.	2.28	Low	6
General Weighted Mean	2.42	Low	

Legend: (Strongly Agree/Very High — 4, Agree/High — 3, Disagree/Low — 2, Strongly Disagree/Very Low — 1)

Table 10 presents the level of confidence of the respondents in utilizing PACS during clinical practice in terms of clinical application confidence. Indicators with a high level of confidence were the following: Indicator 4, integrating PACS use smoothly into routine clinical workflow, obtained the highest weighted mean of 2.63 and ranked 1st. This was followed by Indicator 5, being confident in using PACS during regular clinical duties, with a weighted mean of 2.62, ranking 2nd. Indicator 3, maintaining accuracy when handling multiple imaging cases in PACS, ranked 3rd with a weighted mean of 2.49. Indicator 1, confidently applying PACS functions learned during training to actual clinical situations, placed 4th with a weighted mean of 2.47. Lastly, Indicator 6, being confident in using PACS during high-workload or busy clinical shifts, ranked 5th with a weighted mean of 2.29. On the other hand, indicators with a low level of confidence in PACS clinical application include Indicator 7, maintaining effective PACS use when clinical demands increase unexpectedly, which ranked 6th with a weighted mean of 2.28. This was followed by Indicator 2, the ability to use PACS effectively while managing time constraints during clinical work, which ranked 7th with a weighted mean of 2.13.

Overall, the average weighted mean of 2.42 indicates a low level of confidence among radiologic technology interns in utilizing PACS during clinical practice. The respondents exhibit greater confidence in using PACS due to familiarity and its incorporation into regular, familiar clinical routines, where tasks were predictable. However, despite this confidence in routine

scenarios, the general level of confidence remains low, suggesting that many respondents still face challenges in effectively applying PACS in clinical practice.

Through routine exposure and real-world experience, users can build confidence in utilizing PACS. Those who regularly engage with the system and become familiar with established workflows are better able to navigate its functions and apply them effectively in clinical practice. However, insufficient instruction and limited exposure hinder the ability to manage complex or high-pressure clinical situations, resulting in a lack of confidence and uncertainty when using the system (Santos et al., 2022).

Table 11

The Respondents' Level of Confidence in PACS Utilization: Problem-solving and Decision-making Confidence

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Confident in assessing PACS-related issues and determining appropriate steps to resolve them during clinical tasks.	2.08	Low	4
2. Selects appropriate PACS tools for specific imaging tasks with confidence.	2.69	High	1
3. Solves PACS-related tasks and problems effectively even with minimal supervision.	2.28	High	2
4. Exercises judgment in deciding when to troubleshoot PACS issues independently and when to seek assistance.	2.06	Low	5
5. Chooses appropriate actions when PACS-related problems affect assigned clinical tasks.	2.04	Low	6
6. Prioritizes PACS-related decisions when faced with multiple clinical responsibilities.	1.96	Low	7
7. Makes appropriate decisions when PACS issues require immediate action during clinical work.	2.22	Low	3
General Weighted Mean	2.19	Low	

Legend: (Strongly Agree/Very High — 4, Agree/High — 3, Disagree/Low — 2, Strongly Disagree/Very Low — 1)

Table 11 presents the level of confidence of the respondents in utilizing PACS during clinical practice in terms of problem-solving and decision-making. Indicators with a high level of confidence were the following: Indicator 2, confidence in selecting appropriate PACS tools for specific imaging tasks, obtained the highest weighted mean of 2.69 and ranked 1st. This suggests that respondents are most confident when they can identify and use the appropriate PACS tools for specific clinical tasks, reflecting familiarity and competence with the system's functionality. This was followed by Indicator 3, solving PACS-related tasks and problems effectively even with minimal supervision, with a weighted mean of 2.28, ranking 2nd. Indicator 7, making appropriate decisions when PACS issues require immediate action during

clinical work, ranked 3rd with a weighted mean of 2.22. On the other hand, indicators with a low level of confidence include Indicator 1, being confident in assessing PACS-related issues and determining appropriate steps to resolve them during clinical tasks, which ranked 4th with a weighted mean of 2.08. This was followed by Indicator 4, exercising judgment in deciding when to troubleshoot PACS issues independently and when to seek assistance, ranked in 5th with a weighted mean of 2.06 followed by Indicator 5, ranked 6th, choosing appropriate actions when PACS-related problems affect assigned clinical tasks, which got a mean of 2.04, and lastly, Indicator 6, prioritizing PACS-related decisions when faced with multiple clinical responsibilities, which ranked 7th with a weighted mean of 1.96.

Overall, the average weighted mean of 2.19 indicates a low level of confidence among radiologic technology interns in utilizing PACS for problem-solving and decision-making. Despite high confidence in selecting appropriate tools and handling tasks with minimal supervision, respondents still experience challenges in exercising judgment and making timely decisions when faced with complex or high-pressure situations, which makes the overall mean low.

According to the study of Rajeev Nowrangi et al. (2025), adequate training and tailored PACS education are critical for developing confidence and competence among users. Studies have shown that gaps in training can hinder effective problem-solving and decision-making during clinical work, limiting users' ability to exercise sound judgment and prioritize tasks appropriately. Challenges in judgment and decision-making contribute to the lower overall confidence observed in PACS utilization, particularly when users face complex, high-pressure, or unfamiliar clinical scenarios.

Table 12

Summary Table of the Respondents' Level of Confidence in PACS Utilization

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Cognitive-Technological Adaptability	2.31	Low	2
2. Clinical Application Confidence	2.42	Low	1
3. Problem-solving and Decision-making Confidence	2.19	Low	3
General Weighted Mean	2.30	Low	

Table 12 presents the respondents' level of confidence in utilizing PACS during clinical practice. Among the indicators, clinical application confidence is the highest, with a weighted mean of 2.42 and ranked 1st, followed by technical confidence at 2.31, ranked 2nd. Lastly, problem-solving and decision-making ranked 3rd, with a weighted mean of 2.19. These results indicate that respondents generally lack confidence in performing PACS-related tasks independently, applying knowledge in clinical settings, and making decisions or solving problems related to the system.

Overall, the average weighted mean of 2.30 indicates a low level of confidence among radiologic technology interns in utilizing PACS across all aspects of clinical practice. While

confidence is highest in familiar, routine clinical applications, the findings highlight the need for additional training and structured exposure to enhance technical skills and decision-making in varied or high-pressure scenarios.

Through routine exposure and real-world experience, users can build confidence in utilizing PACS. Those who regularly engage with the system and become familiar with established workflows are better able to navigate its functions and apply them effectively in clinical practice. (Santos et al., 2022). Rajeev Nowrangi et al. (2025) state that challenges in judgment and decision-making contribute to the lower overall confidence observed in PACS utilization, particularly when users face complex, high-pressure, or unfamiliar clinical scenarios. Adequate training and tailored PACS education are critical for developing confidence and competence among users.

Table 13

Relationship between the Respondents' Perceived Challenges and the Level of Adaptability in Utilizing PACS

Adaptability	Challenges Encountered				Decision and Interpretation
	Technical	Usability	Training	Psychological	
Cognitive-Technological Adaptability	r=-0.905 High correlation p=0.000	r=-0.905 High correlation p=0.000	r=-0.899 High correlation p=0.000	r=-0.879 High correlation p=0.000	Reject H ₀ Significant
Affective Adaptability	r=-0.863 High correlation p=0.000	r=-0.869 High correlation p=0.000	r=-0.848 High correlation p=0.000	r=-0.824 High correlation p=0.000	Reject H ₀ Significant

****Significant @ 0.01**

Table 13 presents the relationship between the challenges encountered by respondents and the level of adaptability in utilizing PACS during clinical internships. Cognitive-technological adaptability showed a strong negative correlation with technical challenges ($r = -0.905$), usability challenges ($r = -0.905$), training challenges ($r = -0.899$), and psychological challenges ($r = -0.879$). Similarly, affective adaptability was highly negatively correlated with technical challenges ($r = -0.863$), usability challenges ($r = -0.869$), training challenges ($r = -0.848$), and psychological challenges ($r = -0.824$). All correlations were statistically significant at $p = 0.000$, indicating respondents who perceived challenges demonstrated lower adaptability in handling PACS tasks during their clinical internships.

Individuals who often face major challenges with technology can feel frustrated and stressed, making it harder for them to learn and adapt to new technologies and innovations. If these negative experiences keep happening, it may start to associate technology with difficulty. This problem is even more noticeable in high-pressure places like clinical settings, where mistakes or delays can have serious results. (Tawfik et al., 2021).

Table 14

Relationship between the Respondents' Perceived Challenges and the Level of Confidence in Utilizing PACS

Confidence	Challenges Encountered				Decision and Interpretation
	Technical	Usability	Training	Psychological	
Technical Confidence	r=-0.933 High correlation p=0.000	r=-0.945 High correlation p=0.000	r=-0.952 High correlation p=0.000	r=-0.918 High correlation p=0.000	Reject H ₀ Significant
Clinical Application Confidence	r=-0.846 High correlation p=0.000	r=-0.850 High correlation p=0.000	r=-0.869 High correlation p=0.000	r=-0.847 High correlation p=0.000	Reject H ₀ Significant
Problem-solving and Decision-making	r=-0.842 High correlation p=0.000	r=-0.813 High correlation p=0.000	r=-0.832 High correlation p=0.000	r=-0.801 High correlation p=0.000	Reject H ₀ Significant

****Significant @ 0.01**

Table 14 presents the relationship between the challenges encountered by respondents and the level of confidence in utilizing PACS during clinical internships. The study found that the difficulties respondents face have a significant and detrimental influence on their trust in using PACS. Technical ($r = -0.933$), usability ($r = -0.945$), training ($r = -0.952$), and psychological ($r = -0.918$) challenges all had very strong negative associations with technical confidence. Similarly, respondents' confidence in clinical application declined significantly when they encountered technical ($r = -0.846$), usability ($r = -0.850$), training ($r = -0.869$), and psychological ($r = -0.847$) challenges. Similarly, technical ($r = -0.842$), usability ($r = -0.813$), training ($r = -0.832$), and psychological ($r = -0.801$) challenges had a negative impact on problem-solving and decision-making confidence. All of which were statistically significant at $p = 0.00$. The challenges identified by the respondents were associated with lower confidence in using PACS.

Confidence is diminished by persistent challenges; users become hesitant, less independent, and less likely to use the system's full capabilities, thereby compromising their ability to adapt and perform effectively in clinical environments, which may ultimately affect both workflow efficiency and the quality of patient care. (Qiu et al., 2026).

Table 15

Relationship between the Respondents' Level of Adaptability and the Level of Confidence in Utilizing PACS

Adaptability	Confidence			
	Technical	Clinical Application	Problem-solving and Decision-making	Decision and Interpretation
Cognitive-Technological Adaptability	r=-0.905 High correlation p=0.000	r=-0.905 High correlation p=0.000	r=-0.899 High correlation p=0.000	Reject H ₀ Significant
Affective Adaptability	r=-0.863 High correlation p=0.000	r=-0.869 High correlation p=0.000	r=-0.848 High correlation p=0.000	Reject H ₀ Significant

****Significant @ 0.01**

Table 15 presents the relationship between the level of adaptability and the level of confidence of respondents in utilizing PACS during clinical practice. The results in terms of cognitive-technological adaptability show there is a high positive correlation with all aspects of confidence, specifically technical ($r = 0.934$), clinical application ($r = 0.847$), and problem-solving and decision-making ($r = 0.875$). On the other hand, affective adaptability shows a moderate positive correlation with technical ($r = 0.728$), clinical application ($r = 0.701$), and problem-solving and decision-making ($r = 0.646$). This indicates that as adaptability decreases, confidence in using the PACS system also decreases.

Adaptability plays a crucial role in the effective use of digital tools, as individuals who can adjust to new technologies are more likely to develop confidence in their abilities. In turn, confidence encourages users to explore unfamiliar systems, take on new tasks, and engage in problem-solving without fear of making mistakes, thereby increasing the likelihood of successful adaptation (Rosales-Márquez et al., 2025).

Conclusion

Radiologic technology interns encounter significant challenges in PACS utilization, particularly in training and psychological aspects. Limited instruction on system workflows and insufficient guidance contribute to difficulties in navigating PACS, while technical issues are often perceived as unmanageable during clinical tasks. These challenges negatively affect interns' ability to perform efficiently and adapt to the demands of a technology-driven clinical environment.

The study further revealed that interns demonstrate low levels of adaptability and confidence in using PACS. Although they show willingness to learn, their limited cognitive-technological adaptability restricts effective system use. Confidence remains low due to gaps in technical competence and problem-solving skills. Moreover, findings indicate that higher

perceived challenges are associated with lower adaptability and confidence, while improved adaptability is linked to increased confidence in PACS utilization.

To further address these challenges and strengthen interns' competencies, it is essential to implement a structured intervention plan centered on supervised practice, simulation-based learning, and continuous skills development in PACS utilization. This proactive approach will not only enhance interns' adaptability and confidence but also enable them to effectively manage technical demands and evolving clinical workflows, ultimately improving their performance and contributing to better patient care outcomes.

Table 16

Proposed Intervention Plan to Address Challenges and Enhance Adaptability and Confidence in PACS Utilization Among Radiologic Technology Interns

Areas of Concern	Objectives	Activities	Time Frame	Focal Person	Budget Allocation	Success Indicator
Challenges	Identify and address challenges with PACS utilization in clinical practice	Organize PACS workflow orientation training sessions; Give hands-on demonstrations	One week every rotation	Radiology Department Staff Clinical Instructor Chief Radiologic Technologist	PHP 5,000	> 90% of interns show that they grasp PACS workflows; 80% fewer technical issues are reported 85% of interns are able to solve basic PACS issues without interfering with workflow ≥ 90% of interns effectively use PACS under time constraints; positive feedback from supervisors ≥ 80%
Adaptability	Promote interns' ability to solve problems and adapt to PACS workflow	Simulation-based troubleshooting activities	Every rotation	Radiology Department Staff Clinical Instructor Chief Radiologic Technologist	PHP 3,000	
Confidence	Strengthen interns' confidence when using PACS in healthcare settings	Supervised practice sessions with time management guidance; Performance feedback	2–3 weeks	Radiology Department Staff Clinical Instructor Chief Radiologic Technologist	PHP 3,000	

The proposed intervention plan focused on addressing the identified challenges and enhancing radiologic technology interns' adaptability and confidence when utilizing PACS in clinical settings. The results indicated that interns receive inadequate training in PACS

workflows and face technical challenges that are often perceived as unmanageable, with detrimental effects on their performance. Interns also frequently rely on detailed instructions, suggesting that their cognitive-technological adaptability needs improvement.

Therefore, to address these challenges, the plan focuses a strong emphasis on supervised practice, simulation-based learning, and structured training to strengthen interns' independence and problem-solving abilities using PACS. The intervention plan is designed to equip interns to operate successfully in actual clinical settings, ensuring effective workflow and better patient care outcomes by addressing the challenges encountered to enhance both levels of adaptability and confidence during PACS use.

Recommendation

To address the identified challenges in PACS utilization, radiologic technology interns are encouraged to strengthen their familiarity with PACS workflows through self-directed learning, active consultation with clinical instructors, and continuous development of problem-solving skills to enhance adaptability and confidence. Furthermore, clinical instructors should integrate hands-on PACS demonstrations and troubleshooting into training, providing guidance that promotes independent task management. In addition, the Dean of the College of Radiologic Technology should incorporate PACS-related competencies, including workflow and troubleshooting, into the curriculum and clinical instruction to improve students' cognitive-technological adaptability and confidence.

Moreover, chief radiologic technologists are advised to provide consistent, structured PACS training, offer technical guidance, and maintain a supportive environment that facilitates efficient workflow and skill development. Similarly, hospital administrators and medical directors should ensure the provision of structured training programs, reliable system support, and resources that address both technical and psychological challenges in clinical practice. Consequently, the proposed intervention plan, centered on supervised practice, simulation-based learning, and structured training, should be implemented and regularly monitored by the chief radiologic technologist to ensure effectiveness and alignment with institutional standards.

Finally, future researchers are encouraged to further examine the identified challenges, particularly inconsistencies in PACS workflow instruction and difficulties in technical troubleshooting, and to explore strategies that enhance adaptability and confidence in clinical application.

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