

EFFECTS OF RAPID TECHNOLOGICAL ADVANCEMENTS: AN ASSESSMENT ON THE RADIOLOGIC TECHNOLOGY STUDENT INTERNSHIP PERFORMANCE

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ABSTRACT

Technological advancements play a crucial role in medicine as it's important to the person's health and well being. Radiologic Technology serves as the eye of the medicine that uses different imaging modalities. This study was undertaken to determine the effects of the rapid technological advancements in the imaging industry to the Radiologic Technology Interns. In terms of their clinical performance, perceived support taken from the affiliated hospital, and their coping mechanism that helps them adapt to rapid technological advancements. The study involved 20 Radiologic Technology Interns from 4th year students of the Perpetual Help College of Manila, Academic year 2024-2025.

The researchers employed a quantitative method using a self-made questionnaire distributed via Google Forms to evaluate how technological advancements impact the clinical performance of radiologic technology interns during their internship. This study explores how technological advancements impact radiologic technology students, focusing on their performance, coping strategies, and hospital support. Most respondents were males aged 22–24, mainly affiliated with Jose R. Reyes Memorial Medical Center. While technology improved efficiency, critical thinking, and clinical training, it also led to reduced skills in manual radiographic techniques. Students coped through hospital support, self-learning, and mentorship, though time management remained a challenge.

In conclusion, this study indicates that while interns generally demonstrated adaptability to technological advancements, younger students exhibited a notable advantage in the rapid integration of new imaging techniques into their clinical practice. Based on the findings, it is recommended that students balance both using digital and performing manual radiographic skills, academic programs incorporate more hands-on training, and internship programs offering structured exposure to different technologies. An action plan was proposed to strengthen manual radiographic skills, enhance time management, and improve mentorship opportunities for radiologic technology students.

Keywords: Radiologic Technology students, Technological Advancement, Clinical Performance, Perceived Support, Coping Mechanism.

1. INTRODUCTION

Technology advancement made crucial events in our life. It has been rapidly evolving and made a lot of impressive changes over the decades. From computers, to transportation, to communication

devices, and currently artificial intelligence, making our life more convenient. But that's not where technology limits itself as technology also plays a pivot role in medicine, through diagnostics and treatment to improve a person's health and well-being. According to Bushong (2020), x-rays have been an important part of determining the pathology that can be found within the human body. X-rays were accidentally discovered by Wilhelm Conrad Roentgen on November 8, 1895 while working in his physics lab in Wurzburg, Germany. Once these x-rays emit radiation, it can mostly be helpful in diagnostic procedures and finding different pathologies. As technological innovation continues to transform the medical imaging landscape, the preparedness of the Radiologic Technology Students for these advancements becomes increasingly important. Digital radiography, which allows for quicker processing time and better image quality, is now the standard in most clinical settings. For students, this shift means that they must be well-versed in

handling not only traditional film-based X-ray systems but also for Digital Radiography equipment, which requires different skills and knowledge. Additionally, the advent of more complex systems such as CT and fluoroscopy demands a deeper understanding of the physics behind these modalities, as well as the ability to manipulate advanced equipment for diagnostic purposes. Students must also be able to interpret results accurately, as the success of these systems often depends on the operators skills and in utilizing them effectively. Thus, it is not just about using the equipment but also understanding how it works and its limitations.

However, the integration of advanced technologies into internship programs also presents challenges, particularly due to disparities in resources among educational institutions. Students from well-funded schools have better access to cutting-edge equipment, giving them an advantage. To address this, the study emphasizes the importance of partnerships between academic institutions and healthcare facilities, along with continuous faculty development to ensure educators can train students on the latest technologies.

In conclusion, the researchers acknowledge the vital impact of technological advancements in medical imaging and aim to propose improvements that will help radiologic technology students adapt more effectively to these rapid changes.

2. METHODOLOGY

The researchers gathered the data they evaluated, analyzed, and processed to yield results that are used to come up with findings about the effects of rapid technological advancements on the student internship performance in Perpetual Help College of Manila, they resorted to descriptive research design. Of course, in some instances, the quantitative approach will be applied in order to have a numerical comparison among and between the factors. It relies on numerical data and uses structured tools such as survey questionnaires to gather data. Additionally, the type of questions used are closed-ended questions focused on the target or purpose of the research. It can be used to make predictions based on the gathered data. The results are presented in figures rather than in statements.

Table 1: Demographic Profile**A. Sex**

n=20	f	
No. of Items		Percentage
Male	13	65%
Female	7	35%
Total	20	100%

The table shows the frequency and percentage distribution of the profile of the respondents based on their Sex. It clearly states that Male got the larger number of participants with 13 or 65% while Female obtained 7 or 35%.

B. Age

No. of Items		Percentage
19-21	4	20%
22-24	12	60%
25-27	3	15%
28-30	1	5%
31 and above	0	0%
Total	20	100%

The table shows the frequency and percentage distribution of profiles of the respondents based on their Age. Most of the respondents are within the age range from 22-24 years old with 12 or 60%, the age range of 19-21 got the 2nd rank with 4 or 20%, the age range of 25-27 got the 3rd rank with 3 or 15%, the age range of 28-30 got the 4th rank with 1 or 5%, and lastly the age range 31 and above got the last place with 0 or 0%. As stated by Aljasem et al. (2020), most of the age of the respondents in a university especially in academic research are usually in their early twenties. This means that the younger generation are more participating in research.

C. Affiliated Hospitals

No. of Items		Percentage
Jose R. Reyes Memorial Medical Center	9	45%
Cardinal Santos Medical Center	4	20%
Philippine Children's Medical Center	2	10%
East Avenue Medical Center	2	10%
Philippine Orthopedic Center	2	10%
Philippine General Hospital	1	5%
Total	20	100%

The table shows the frequency and percentage of the respondents based on their Affiliated Hospital. Most of the respondents belong to Jose R. Reyes Memorial Medical Center with 9 or 45% of the respondents, the Cardinal Santos Medical Center got 4 or 20% of the respondents, the Philippine Children Medical Center, East Avenue Medical Center, and Philippine Orthopedic

Medical Center got 2 or 10% of the respondents, lastly the Philippine General Hospital got 1 or 5% of the respondents.

Table 2: Effects of Technological Advancements

No.	Indicator	Mean	SD	R	VI
1	It has been effective in improving the efficiency at which I perform clinical tasks during my internship.	4.65	0.59	2.5	Very High
2	It enhances my ability to develop critical thinking and problem-solving skills during my clinical internship.	4.65	0.59	2.5	Very High
3	The increased reliance on advanced imaging technology has reduced my ability to perform manual radiographic techniques.	4.3	0.66	4	Very High
4	It improves my ability to handle complex tasks independently during my internship.	4.45	1.23	3	Very High
5	It becomes an effective tool in shaping the future of clinical internships in radiologic technology.	4.7	0.47	1	Very High
Average Mean: 4.65					
Standard Deviation: 0.71					

Effects of Technological Advancement in Student Performance

The table 2 shows the answers of the respondents regarding “The Effects of Technological Advancements in Student Performance”. Indicator 5 “It becomes an effective tool in shaping the future of clinical internships in radiologic technology” ranked 1 with the highest weighted mean 4.7 and interpreted as Very High. Followed by indicator 1 “It has been effective in improving the efficiency at which I perform clinical tasks” and 2 “It enhances my ability to develop critical thinking and problem-solving skills during my clinical internship” tied up and ranked 2.5 with weighted mean of 4.65 and interpreted as Very High. followed by indicator 4 “It improves my ability to handle complex tasks independently during my internship” ranked 3 with weighted mean 4.45 and interpreted as Very High. Lastly indicator 3 “The increased reliance on advanced imaging technology has reduced my ability to perform manual radiographic techniques.” ranked 4 with a weighted mean of 4.3 and interpreted as Very High. The results are supported by the study of Umpar and Sison (2025), in which the continuing advancements in the imaging modalities used in Radiologic Technology, helping the radiologic technology students to develop their skills especially in their internship. This means that the clinical internships in radiologic technology are going to have a bright future because of the positive effects that these advancements bring.

Table 3: The coping mechanism performed to adapt to the rapid technological advancements

No.	Indicator	Mean	SD	R	VI
1	It helps me manage the stress of using technology during internship.	4.5	1	2	Very High
2	The hospital of affiliation supports us to adjust to rapid technological advancements.	4.55	0.51	1.33	Very High
3	I helped myself to learn independently to adapt with new technological tools.	4.55	0.6	1.33	Very High
4	I seek guidance from senior interns and radiologic technologists to adapt new trends in imaging.	4.55	0.6	1.33	Very High
5	I practice time-management to balance my internship with my daily tasks.	4.45	0.6	3	Very High
Overall Weighted Mean:					
Standard Deviation: 0.66					

Coping mechanisms

Table 3 shows the answers of the respondents regarding “The Coping Mechanism Performed to Adapt to the Rapid Technological Advancements”. Indicator 2 “The hospital of affiliation supports us to adjust to rapid technological advancements.”, 3 “I helped myself to learn independently to adapt with new technological tools.” and 4 “I seek guidance from senior interns and radiologic technologists to adapt to new trends in imaging.” tied up and ranked 1.33 with a weighted mean of 4.55 and interpreted as Very High. Followed by indicator 1 “It helps me manage the stress of using technology during internship.” ranked 2 with a weighted mean of 4.5 and interpreted as Very High. Lastly, indicator 5 “ I practice time-management to balance my internship with my daily tasks.” ranked 3 with a weighted mean of 4.45 and interpreted as Very High. In terms of hospital affiliation, the results are supported by the study of Motsaanaka et al. (2024), in which the support and implementation of the adoption by hospitals and institutions in the use of technology, is crucial to the development of the competencies and skills of the students during their internship. In terms of learning independently to adapt to the technology, such results are supported by the study of Finn et al. (2024), wherein there are different factors in which the ability of self-learning would be considered as a success and if the factors are in all positive, the student will have no problems in doing self-learning especially in adapting to the latest technologies and trends. In terms of mentorship, the results are supported by the study of Arruzza (2023) in which it focuses on the relationship between the radiologic technologist as a mentor, and the student as a mentee. It mentions that mentorship is important because having such a relationship will help nurture and develop the skills of the student as he/she continues to apply what has been learned from his/her mentor and to continuing to adapt to the latest technology.

Table 4: Perceived support is provided by the affiliated hospital for the respondents to develop technical proficiency in their clinical internship.

No.	Indicator	Mean	SD	R	VI
1	Senior Radiologic Technologists provide proper guidance.	4.5	0.69	3.5	Strongly Agree
2	They allow access to hands-on practice with different imaging modalities.	4.5	0.69	3.5	Strongly Agree
3	I helped myself to learn independently to adapt with new technological tools.	4.6	0.5	1.5	Strongly Agree
4	The provided technical support and sufficient clinical training help enhance my proficiency in handling patients and performing radiographic procedures.	4.6	0.5	1.5	Strongly Agree
5	They foster a culture of learning and support among staff which provide opportunities for inquiry and research.	4.55	0.6	2	Strongly Agree
Average Mean: 4.52					
Standard Deviation: 0.66					

Perceived support provided by the Affiliated Hospitals

The table 4 shows the answers of the respondents regarding “Perceived support is provided by the affiliated hospital for the respondents to develop technical proficiency in their clinical internship” Indicator 3 “I helped myself to learn independently to adapt with new technological tools.” and 4 “The provided technical support and sufficient clinical training help enhance my proficiency in handling patients and performing radiographic procedures.” tied up and ranked 1.5 with weighted mean of 4.55 and interpreted as Very High. Followed by indicator 5 “They foster a culture of learning and support among staff which provide opportunities for inquiry and research.” ranked 2 with a weighted mean of 4.55 and interpreted as Very High. Lastly, indicator 1 “Senior Radiologic Technologists provide proper guidance.” and 2 “They allow access to hands-on practice with different imaging modalities.” tied up and ranked 3.5 with a weighted mean of 4.5 and interpreted as Very High. The results are aligned to the study of Ingrassia (2020) in which radiologic technology students are given the opportunity to learn and navigate independently on the latest advancements and technology which are useful for their development. This specifically shows a sign of support because the students are encouraged to be eagerly updated and to learn all things new especially the technological advancements. Providing feedback and evaluation of performance are conducted to measure the performance of the students in their internship and this also shows a sign of support coming from the senior radiologic technologist who are guiding the students.

Table 5: Relationship between the Effects of Technological Advancement in Student Performance and the Demographic Profile of the respondents

Variables	Pearson Correlation	P-Value	Interpretation
Demographic			
Effects of Technological advancements	-0.459	0.042	Moderately negative correlation

Significant relationship between the effects of technological advancement in student performance and the demographic profile of the respondents.

The result indicates a moderate and statistically significant negative relationship between demographic factors and the effects of technological advancements on radiologic technology students' internship performance. Further research with a larger sample size could provide deeper insights into specific demographic factors influencing this relationship. It is therefore concluded that younger individuals are more likely to adapt faster to recent innovations done in technology than to those older individuals. (Caturay et al., 2023)

3. CONCLUSION

The study revealed that radiologic technology technology interns are able to adapt to the rapid technological advancement. However, the younger generation have the upper hand when it comes to the usage of technologies featured in different modalities in which they used to their advantage on learning as much as they can during their internship.

4.RECOMMENDATION

To assess the effects of the rapid technological advancements on the clinical performance of the radiologic technology students during internship, the following recommendations are implemented based on the results and conclusions of the study being presented:

- 1.Radiologic Technology Students should embrace continuous learning, practice adapting to new software and hardware quickly while embracing the new technology and most importantly to not neglect the importance of core radiographic principles.
- 2.Professors/Teachers incorporate hands-on training and utilize simulation to develop teaching strategies that promote critical thinking and problem-solving skills, and to stay updated on the latest advancements in radiologic technology through conferences, workshops, and online resources.
- 3.Internship Coordinator develop structured internship programs that provide students with opportunities to work with a variety of technologies that ensure students receive adequate training and supervision, and foster communication between students, mentors, and healthcare professionals.
- 4.Affiliated hospitals invest in the latest radiologic equipment and software to ensure that interns have access to these technologies during their training, and to assign experienced radiologic technologists to mentor the interns.

5.Future Researchers can conduct further investigation of the long-term impact of technological advancements on the clinical competence of the radiologic technology interns.

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