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### Open Lab vs. Radiologic Students Final Practical Grades

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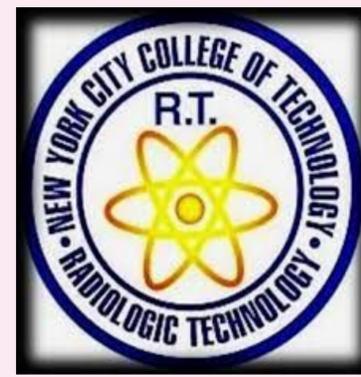
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# Open Lab Vs. Radiologic Students Final Practical Grades

By-Navdeep Kaur, Katie Tam, Robert O'Brien, Safraz Harun  
Mentor- Zoya Vinokur



## Abstract

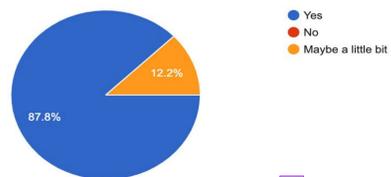
Open Lab provides the students of the Radiologic Technology & Medical Imaging Department the opportunity outside regular class time to practice communicating effectively in a health care setting, and grants the students the freedom to craft critical thinking skills in a radiologic environment. Our research aims to analyze the correlation between hourly time spent in Open Lab, and its contributing factor to a student's overall Radiographic Procedures grade. The amount of time spent in Open Lab can additionally contribute to a student's grasp of didactic concepts, and their integration into the clinical setting. Additional time spent in the laboratory can demonstrate a student's ability to visualize structures radiographically as well as demonstrate a student's positioning plan to acquire a diagnostic image. Analyzation of data collected will show how Open Lab has helped imaging students to understand the didactic component of positioning and integrate it into their lab practical performance progressively. A gradual improvement can be shown as students' positioning and imaging will reflect during lab practical examinations. Data accumulated is essential in showing how Open Lab truly aids in the development of that student into an ARRT Registered Radiologic Technologist. It is of utmost importance as newly accepted students have minimal exposure to unfamiliar radiologic content and equipment knowledge that results from the span of Two years spent in the Radiologic Technology & Medical Imaging program at New York City College of Technology.

## Introduction

Radiographic imaging student's ability to conceptualize positioning as well as apply them to real life patient care, and diagnostic imaging is essential for their critical thinking development. Open Lab has provided progressive, and gradual improvement of students' overall final performance. Time spent in Open Lab can aid in a student's performance for practical examinations as it allows that student to visualize anatomical structures discussed in class. Open Lab enables a student to develop in-room patient rapport as well as critical thinking for patient positioning to acquire diagnostic film. Time spent in Open Lab can help a student visualize and differentiate between similar radiographic views. Longitudinal study of previous radiographic alumni's performance can also display the significance of Open Lab and its real world application as a Radiologic Technologist. We believe that there will in fact be a correlation. We believe the more hours the students spend, the better their grades will be.

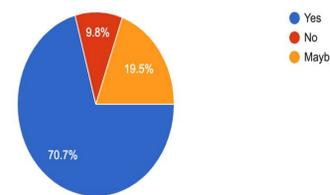
## Senior Results

Do you believe open lab helped improve your practical grade?  
41 responses



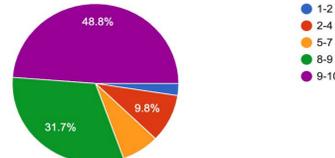
One of the main goals of this research project was to keep all of the questions answered without being biased. Since the radiology department required the students to attend lab in order to gain their mandatory lab hours for them to progress to the higher level Radiographic Procedure courses. One of the questions we deemed unbiased would be "would they attend Open Lab if it wasn't required". Based on the survey results Seniors have answered "maybe", which translated to 19.5 percent. While 71 percent of the results of the seniors answered "YES". We concluded that mandatory open labs are helpful to the senior student of the radiology

Would you do open lab if it wasn't required?  
41 responses



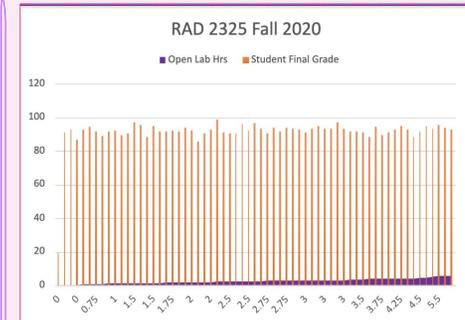
Based on the surveys responses that we received from the senior students of the Radiology Department, 88 percent of the entire senior student body said "Yes" to Open Lab's improvement on their practical grades. This suggests that Open Lab has significantly helped improve their practical grade. While the last remaining 12 percent stated "maybe" which shows that remaining of the student did not improve or their grades state the same as before. The results show that out of the 41 students, no one answered "no" to that question.

On a scale of 1-10 (10 being most helpful) how helpful was open lab?  
41 responses

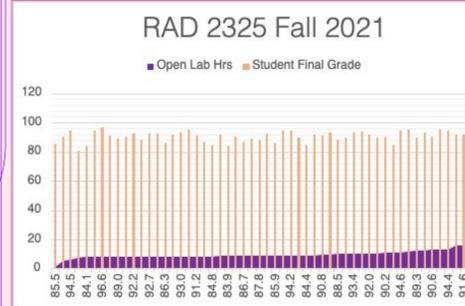


Based on the data that we collected from the seniors of the Radiology Department, 48.8 percent of the whole student body answered the survey by stating "9-10", showing the Open Lab is helpful to them. The data consisted of a scale range of 1 to 10; with one being the lowest and ten being the highest which would translate to their performance. While the remaining students are divided into different scales. For example, only 31.7 percent reported a scale of "8-9" which is the second majority of the student body. While the few remaining percent are slotted in the middle of the scale. Where 9.8 percent only stated out of 10, 5 to 7 scale is what they felt based on their performance.

## Longitudinal Alumni Study



A longitudinal study of student's hourly time spent in Open Lab shows that additional time outside of scheduled class time has had a significant impact on the students final Radiographic Procedures grade. Data suggest that students who spent additional lab time outside of mandatory laboratory hours were more inclined to gradually improve in the course. RAD 2325 given during Fall 2020 was facilitated via distance learning. Availability of Open Lab varied due to social distancing guidelines. Mandatory required hours for that semester was set to 4 hours, however students that spent additional time outside the mandatory hours, had a significant overall improvement in their final course grade. Data of Fall 2021 supports this claim as mandatory lab times had been doubled as in-person classes began to resume. Those students who spent additional lab time outside the mandatory 8 hours of laboratory time, displayed progressive improvement in the overall understanding of the course subject and diagnostic image evaluation criteria.

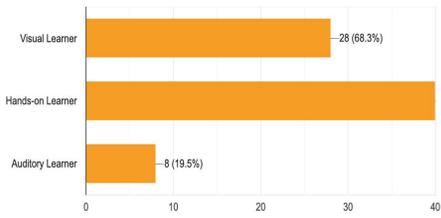


## Methodology

Distribution of surveys will assist in gauging how diagnostic imaging students find the beneficial use case of Open Lab to their conceptualization of radiographic imaging along with its associated positioning. Students would fill out questionnaires in relation to utilization of open lab based on didactic information, and its relation to lab in order to prepare for practical examinations. Data accumulated is diagnostically crucial as newly accepted students in the Radiologic Technology and Medical Imaging program at New York City College of Technology have the least amount of exposure to Radiography, and the scope of diagnostic imaging. Therefore, Open Lab was developed to give each, and every student additional lab practice as well as the necessary exposure outside class time to practice radiographic positioning. This is important for the clinical component of the Radiologic Imaging Program in order for that student to conceptualize diagnostic image evaluation. Open Lab serves as an environment for that student to not only develop effective equipment manipulation, but rhythmic flow that will systematically work for all patient body habitus. The ability to practice positioning outside the limited scheduled class time is crucial for clinical component of the Radiologic Technology and Medical Imaging program. Ability to conceptualize various positions will thus contribute to that students overall final radiologic procedures grade. In order to maximize our target audience, we distributed anonymous Google surveys to all radiologic imaging students in order to keep the surveys unbiased. Similarities amongst responses displays the significance of dedicated Open Lab time for both junior and senior students. The survey responses were designed to target specific topics such as age, how Open Lab has helped that student the most, and what radiologic positioning content Open Lab has helped that student perfect.

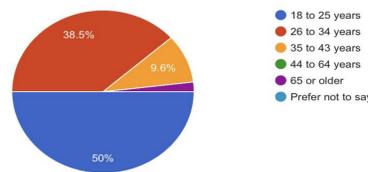
## Student Correlating Data

What type of learner are you?  
41 responses



While analyzing data collected, we found correlations between both groups of students in their ability to conceptualize radiologic positioning. Open Lab enables visualization of anatomic structures, and positioning that corresponds with the image evaluation criteria required for diagnostic film. Many of the radiologic imaging students are hands-on learners followed by visual learning. Using associative learning, students can utilize classical conditioning to aid in their visualization of radiographic criteria. Learning through association was discovered by Russian physiologist Ivan Pavlov. In Pavlov's experiment on classical conditioning, "the sound of the tone served as the conditioned stimulus that, after learning, produced the conditioned response (CR), which is the acquired response to the formerly neutral stimulus" (Walinga, J., & Stangor, 2014). By dedicating time to Open Lab, students can utilize visualization techniques as a conditioned stimulus to evaluate diagnostic criteria for medical imaging. Open Lab serves as a stimulus to facilitate adaptive learning, and critical thinking analysis. Therefore, through adaptive learning facilitated by the Radiologic Technology and Medical Imaging Department, students can sharpen their visualization of imaging criteria outside of required laboratory hours to improve their overall radiologic performance and reproducibility.

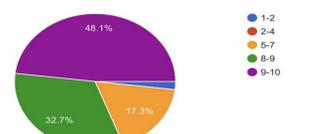
What is your age?  
52 responses



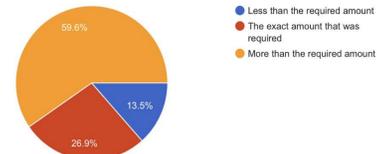
This chart separates the students of the junior class by age group. Out of the 52 total remaining junior radiography students, exactly half of said students (50%) are between the ages of 18-25. The second majority of students (38.5%) range from age 26-34. The next group of students (9.6%) are between the ages of 44-64. And the remaining students (1.9%) are 65 or older. This data provides insight on the age demographic because age may have a contributing factor to the student's performance in this rigorous program.

The data in this chart represents the amount of junior students who have met, exceeded, or fell below the Open Lab attendance goal for this current semester: Spring 2022. The goal is to meet 8 hours or more of Open Lab hours to earn credit for this portion of their final grade in the RAD 1225 course. About 59.6% of junior students stated that they exceeded the 8 hour goal, while about 13.5% of junior students have less than the required 8 hours. Approximately 26.9% of students met the goal exactly at 8 hours. This information gives us insight into how much work the students are putting into their program performance outside of lecture, lab and clinical hours.

On a scale of 1-10 (10 being most helpful) how helpful was open lab?  
52 responses



How often did you attend open lab?  
52 responses



This chart represents the survey answers to how helpful students feel Open Lab has been toward their overall performance in the program. A rating of 1-2 being the least helpful and 9-10 being the most helpful. About 48.1% of the junior students answered that they found Open Lab to be very helpful by responding with a 9-10. On the other hand, 1.8% of students answered that Open Lab has not been helpful to them at all by submitting a score of 1-2. The rest of the students fell in the middle of these two extremes. This data is useful in understanding the junior students' feelings about the Open Lab requirement and its personal impact on their conceptualization of the information being taught in class.

## Conclusion

Student's within the Radiologic Technology & Diagnostic Imaging fall in the age groups of 18-25. The remainder of the students ranges from 26 and older. Most students (59.6%) attend more than the required Open Lab hours for additional preparation and practice. 48.1% of first-year Junior class found Open Lab to be helpful in their academic experience. It can be inferred from the data collected that Open Lab is truly beneficial for radiologic imaging students. Many students find the beneficial aspect of Open Lab to be influential on their clinical experience. The time dedicated to Open Lab can demonstrate tremendous improvement on a students final radiologic procedures grade. It enables the student to perform routine radiological projections more efficiently to develop a systemic flow. About 13.5% of Junior students have not met the Open Lab hour requirement. However, altogether 86.5% have either met or exceeded the Open Lab hour goal and more than half the class found it to be beneficial. Therefore, a correlation can be made with the outcome of the data that Open Lab is beneficial to Junior and Seniors students' performance in this current semester.

## References

Walinga, J., & Stangor, C. (2014, October 17). 8.1 Learning by association: Classical conditioning. Introduction to Psychology 1st Canadian Edition. Retrieved April 27, 2022, from <https://openstax.org/r/introduction-to-psychology/chapter/7-1-learning-by-association-classical-conditioning/>  
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