

CHALLENGES IN THE ONLINE LEARNING OF LABORATORY SUBJECTS: A PROPOSED SOLUTION FOR ENHANCEMENT

Trish Elaissa R. Acaso, RRT, Aubrey Ann Klein D. De Jesus, RRT, Diego D. De Jesus, RRT, Anne Gweneth O. Dimaapi, RRT, Ms. Cecilia J. Cardoso, PhD, Mr. Noel J. Acosta, PhD
College of Radiologic Technology, Perpetual Help College of Manila, 1240 V. Concepcion Street, Sampaloc, Metro Manila, 1015 Philippines

<https://doi.org/10.54922/IJEHSS.2023.0610>

ABSTRACT

This study seeks to present and discuss the different Challenges of Online Learning of Laboratory Subjects as well as provide a solution for enhancement.

The researchers survey to gather basic information that is essential for the collection of data such as the profile of the respondents based on their age, gender, year level, and location of current address.

Also, they seek to determine the challenges being encountered by the students and how these factors affect their learning of skills in laboratory subjects, together with providing solutions for the mentioned dilemma.

Keywords: Challenges, Online Learning, Laboratory Subjects.

1. INTRODUCTION

Basic or preclinical sciences are considered a foundation of medical practice. Due to unforeseen events happening around the world (COVID-19), most of the universities and schools in the Philippines have adjusted to give students a new way of learning methods and these include the use of technology and the availability of enhanced applications like Google meets, Zoom or Skype. Most schools have complied with these programs so the students still learn and adapt to the current situation. Although some courses are favorable for this method some still require the actual demonstration of teachings mostly, medical courses, which require equipment to work on the actual handling of equipment, and other knowledge that must be supervised.

Since Radiologic Technology is an uprising course almost 90% of the students are affected for a reason that there are no laboratories to learn with. These new methods of learning must be adjusted as the students can conceptualize the difference between pictures and videos compared to actual demonstration.

The Global Pandemic of COVID 19 has had an impact on every area of human life, including medical education, which led to the suspension of Face-to-face teaching in medical schools around the world. Medical schools have adopted several innovative strategies in response to the crisis, with the modification of learning and online evaluation. However, medical schools are currently facing the greatest challenge "Training medical students within the limitation of social distancing", especially in the preclinical phase due to the suspension of practical sessions/laboratories. (Review article: Challenges and Opportunities of Preclinical Medical Education: COVID-19 Crisis and Beyond by Gaur, U. et. al. 2020)

In the previous batches of Radiologic Technology students who experience access to dissection rooms and practical labs, prosecutions, models, pathology specimens, skeletons, and

other lab- or practical-based materials and equipment, it became much easier for them to understand the lectures being discussed or demonstrated by their professors in the laboratory because of the different actual activity that is being assigned to them. Most of the students did completely understand the lessons that is being demonstrated or discussed due to different experiments and activities that are executed during the classes.

Before the pandemic, Radiologic Technology students can understand and learn about their subjects properly, especially those students who have laboratories subjects. Each student can perform the actual demonstration that has to be learned in the laboratory subjects such as Human Anatomy and Physiology, Radiation Production and Characteristics, Principles of Imaging, Patient care management, Pharmacology and venipuncture laboratory, Radiographic Positioning, and many more. In each subject that is being mentioned, there is an actual demonstration of skills and knowledge that must be performed for a student to fully understand what their instructor/professor is trying to teach or to demonstrate.

Comparing it to today's generation because of the COVID 19 pandemic all schools and colleges in the Philippines are in online classes set up, wherein there will be no face-to-face classes that will be conducted, but rather it'll be completely online learning. This is due to restricting policies that are being implemented by the government officials to prevent the students to accumulate viruses from the outside. This is a major concern since the medical learning of students has already shortened the basic medical science teaching time and because of this, it limits the student's exposure when it comes to anatomy and other important foundation subjects of the medical program.

Since laboratory subjects are being said to be prohibited for medical students, for the past year of fully online learning classes, mainly focusing on Radiologic Technology students, this raises concern about the challenges that the students have encountered for a year.

The study will focus on the challenges of lacking actual demonstration which is necessary for the student's learning to have a good foundation of knowledge and skills. This is a major concern because having an adequate foundation of knowledge and skills will help them to be more prepared for the board examination. In addition, being more equipped as a Radiologic Technology student has a huge factor to be more competent when it comes to performing the skills that they have learned and practiced for years in medical school.

The purpose of the study is to evaluate the amount of learning that a Radiologic Technology student can acquire in online learning of laboratory subjects. This will also address several challenges that a student may have encountered in online classes as well as provide a solution for the students and professors when it comes to this dilemma that is experienced in today's era in medical education.

2. METHODOLOGY

This chapter deals with the research method that is used in this study; this includes methods and techniques, the locale of the study, population and sample size, research instrument, data gathering procedures, data processing and statistical treatment of data.

Methods and Techniques of the Study

To acquire diverse findings on determining the challenges being experienced by the students in online learning of laboratory subjects, as well as providing recommended solutions. This study applied descriptive research with a combination of the good elements of quantitative

and qualitative research approaches to have adequate support for collecting the data from the respondents.

According to Busetto et.al. (2020), Qualitative research is defined as “the study of the nature of phenomena”, including “their quality, different manifestations, the context in which they appear or the perspectives from which they can be perceived”, but excluding “their range, frequency and place in an objectively determined chain of cause and effect”

While on the other hand, according to Bhandari (2020) Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations. It is the opposite of qualitative research, which involves collecting and analyzing non-numerical data.

The researchers commence with a quantitative questionnaire problem and fetch up with scrutiny of primary quantitative data using the qualitative strand. With the use of the mixed-method type of research, first, the quantitative questionnaire is implemented to gather quantitative data from students regarding several challenges they have encountered during online learning of laboratory subjects. Next, the researchers implemented qualitative questionnaires to determine how these factors affect the student’s online learning of laboratory subjects. Then the researchers asked the respondents about other specific challenges they have encountered regarding the mentioned factors, as well requesting the students to state some of the ways that help them to cope with the challenges which can also help the researchers to elaborate on and enhance these possible solutions that can also be a recommendation for the readers of the study.

To sum up, the quantitative and qualitative results will be interpreted to be able to finalize the data that will be gathered regarding the challenges of online learning as well as create an enhancement program to improve understanding of the laboratory subjects of the students.

Locale of the Study

The study is conducted at Perpetual Help College of Manila among 34 students from 2nd year to 4th-year Radiologic Technology students. Figure2. Primary locale of the study (Map of Perpetual Help College of Manila)

Perpetual Help College of Manila

In 1970, the Perpetual Help College of Malasiqui was founded to help spur health and education development in the province of Pangasinan. In 1975, Dr. Antonio Laperal Tamayo together with his wife, Dr. Daisy M. Tamayo founded the Perpetual Help College Rizal, now the University of Perpetual Help System DALTA. This was followed by the establishment of the Perpetual Help School of Laguna in 1976 and the Perpetual Help School of Laguna Foundation for Medicine and Health Sciences, now known as the University of Perpetual Help- Dr. Jose G. Tamayo Medical University in 1977, both in Biñan, Laguna.

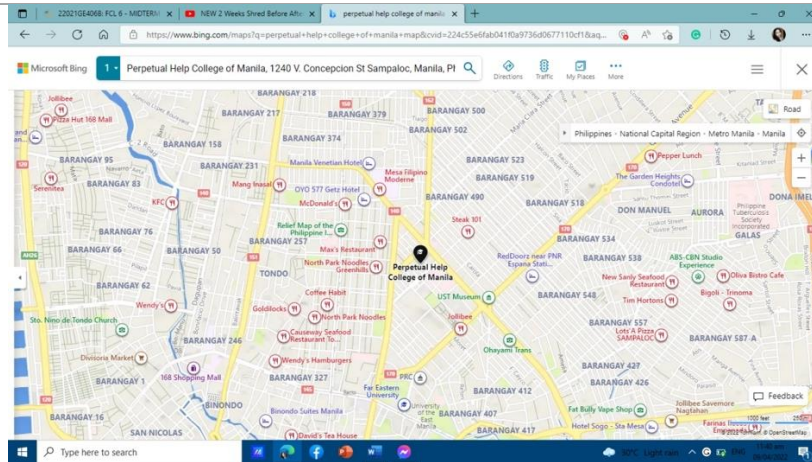


Figure 2. Primary Locale of the Study (Perpetual Help College of Manila)

Population and Sample size of the Study

According to Yamane (1967), Slovin’s formula is used to calculate an appropriate sample size from a population. The researchers organized the study at Perpetual Help College of Manila, with a total of 34 Radiologic Technology students as population size, having a 98% confidence level with the sample size of 32 respondents which is determined using the Slovin’s formula wherein the sample size (n) is equal to the population size (N) is divided by a constant value 1 plus the margin of error e multiplied with the population size (N) and multiplied by 2.

The selection of the respondents is done using simple random sampling. According to Crossman (2020), simple random sampling is known as the basic and common type of sampling method used in quantitative research. In line with the study, everyone will be chosen, and each member of the population will have a probability of being selected.

Slovin’s formula:

Where:

n= sample size

N= population size

e= margin of error

$$n = \frac{N}{1 + Ne^2}$$

N = 34

e = 0.05

Solution:

n =

n =

n = 31.48 = 3

<p>Slovin’s formula:</p> <p>Where:</p> <p>n= sample size</p> <p>N= population size</p>	<p>N = 34</p> <p>e= 0.05</p> <p>Solution:</p> $n = \frac{34}{1+34(0.05)^2}$ $n = \frac{34}{1.08}$ <p>n = 31.48 = 32</p>
---	---

Table 1. Slovin’s Formula (Sample Size of the Study)

Year Level	Response (f)	Percentage
2 nd year	8	24%
3 rd year	12	35%
4 th year	14	41%
Total	34	100%

Table 2. (Distribution of Respondents According to Year Level.)

Research Instrument

For developing the desired primary data, a four-part researchers-made questionnaires checklist was used. Part I covers the student’s demographic profile of the respondent including age, year level, and location of current address. Part II focuses on the respondent’s following factors that they have experienced during online classes. Part III highlight the support provided by the school to assist the online learning of the laboratory subjects of the students. Part IV focuses on the personal statements of the respondents regarding the specific challenges they’ve experienced as well as the coping strategies they think would help them to overcome the challenges encountered during online classes of laboratory subjects. In answering the questionnaire checklist, the respondents are asked to evaluate each of the statements that are being given to measure their practices.

The provided questionnaires did undergo validation by a panel of experts – a Radiologic Technologist, a researcher, a grammarian, and a statistician who will review the instrument and will provide feedback for the improvement of the tool.

Data Gathering Procedure

The researchers submit a questionnaire to their thesis adviser. The researcher’s goal is to produce useful and concrete solutions that provide students with effective ways to overcome the challenges that they have encountered in online learning of their laboratory subjects, as well as the educators and administrators of the schools.

Upon the approval of the researcher’s thesis adviser, a letter is sent to the Dean of the Bachelor of Science in Radiologic Technology of the Perpetual Help College of Manila requesting permission to conduct the study. After the letter has been approved, the Questionnaires are administered and distributed by the researchers among the 34 students from 2nd year to 4th year that were currently taking their laboratory subjects in Radiologic Technology course using an electronic survey method through Google Forms from March 1 to March 4. This google form contains the list of validated questionnaires that are distributed to the students. Google form of the

survey is immediately collected after the respondents have answered and filled in the required data in the google survey sheet.

The researchers assured the respondents that whatever gathered data from them will be treated with most confidentiality. To ensure that the Data Privacy Act of 2012 is being performed, which is to protect the privacy of individuals while ensuring the free flow of information to promote innovation and growth.

Data Processing and Statistical Treatment

In this chapter, after the researchers gathered all the data from the respondents, the researchers evaluate, computed, tabulated, and interpret the data qualitatively using following the statistical treatment that will about discussed in the further part of the study. According to Calzon (2022), interpretation is known as the process of using diverse analytical methods to review data and arrive at relevant conclusions. These help researchers categorize, manipulate, and summarize information for the researchers to come up with effective solutions that will benefit the readers of the study.

To come up with valid and reliable data of information from the respondents, the following statistical method and procedures were used:

- 1. Percentage Frequency Distribution** is utilized to present the data that indicates the percentage observation for the Likert scale responses. This helps researchers to determine and evaluate the relative frequency of the challenges experienced by the students regarding the online learning of the laboratory in terms of the following factors being mentioned and what effective solutions can the researcher come up with to address students’ concerns.

$$P = \frac{f}{n} \times 100$$

Where:

- p*- percentage
- f*- frequency
- n*- total number of respondents.

The percentage was used in determining the profile of respondents in terms of age, gender, year level, and current location of the students.

Frequency and Percentage Formula: $P = F/N \times 100$

Where:

- P** – Percentage
- F** – Frequency of responses
- N** – Total number of respondents

- 2. Measures of central tendency** to compute for the average of the given data set, the study uses a weighted mean formula which determines the respondent’s level of percentage if how many students respond to each given type of challenge that they’ve experienced and rated it with the use of 5-point frequency Likert scale.

For Weight:

$$wt f \times converted\ scores$$

For Total Weight:

$$TW = \sum wt$$

For Weighted Mean:

Where:

F = number of respondents

wt = weight

TW= total weight

N= summation of frequency

3. Likert Five-Point Scale - The table below presents the five-point liker scale. According to Cornell (2021), the Likert scale is a type of scale that is used to measure the respondent’s viewpoint towards the subject. The survey takers are being given single choice and close-ended questions that would allow the brands to collect more detailed information than yes or no binary answer. The table below presents the average of the students’ responses which will be computed by the researchers. Table 2 Likert scale.

Numerical rating	Range	Verbal Interpretation
5	4.21-5.00	Always
4	3.41-4.20	Often
3	2.61-3.40	Sometimes
2	1.81-2.60	Rarely
1	1.00-1.80	Never

Table 3. (Five-Point Likert Scale)

On the other hand, to present and support the interpretation of the numerical findings in the results of the quantitative part, the researchers used descriptive and provide triangulation for the qualitative survey part of the study. With the help of the triangulation method, the researchers were able to expound on the responses of the students by elaborating on the specific experienced challenges they encountered during online learning of their laboratory subjects.

According to Richard (2014) Triangulation helps researchers to confirm and validate the quality results using quantitative studies, it also helps in obtaining more insights by using multiple methods. Another thing is that inconsistencies can be recognized and removed as well as increasing and strengthen the credibility and validity of the data and that can help and lead to stronger research design.

3. SUMMARY OF THE FINDINGS

The study aimed to determine the several challenges of online learning of the laboratory subjects and implement a proposed solution for enhancement for the students. The study obtained the demographic profile of respondents according to their gender, age, year level, and current location.

Part I. What is the demographic profile of the Respondents?

1.1 Gender.

Based on the findings out of 34 students who responded to the google form survey conducted, it has been noted that it was predominantly female with 68% while the remaining 32% are male.

1.2 Age.

Most of the respondents came from the range of 18 to 22 years old with a percentage of 64%. Meanwhile, the ages 23 to 27 years old got the total percentage of 24%. Furthermore, ages 28 to 32 years old have the 9%. For the time being, ages 33 to 37 years old with a percentage of 3% and lastly there is no student aged 40 years old and above that are currently enrolled in BS Radiologic Technology at the Perpetual Help College of Manila.

1.3 Year Level.

The greatest quantity of the respondents was all coming from the 4th year level with the total number of 14 students having the percentage of 41%. Meanwhile, the 3rd year level has a total of 12 students with a percentage of 35%. Lastly, the remaining respondents are all came from 2nd year with a total number of 8 students having the percentage of 24%.

1.4 Location.

According to the data, most students are all located at the NCR with a total percentage of 79%. Meanwhile, the remaining students are all living outside the National Capital Region with a total percentage of 21%.

PROBLEM 1

How do these factors affect the students in online learning of laboratory subjects?

1.1 Internet Connection (Specific Challenges)

The gathered data shows that most of the students are experiencing a delay in project submission due to poor internet connection which got the highest computed mean value of 5 which has a descriptive interpretation of “Always”, next having difficulty of learning skills for laboratory subjects due to slow access to the internet got a computed mean value of 4.79 which has a descriptive interpretation of “Always”. Meanwhile, having an unstable internet connection at home got the computed mean value of 3.56 which interprets “Often”. Furthermore, often using prepaid data only for online classes got a computed mean of 3.15 which interprets “Sometimes”. Lastly, currently living in an area that is being limited in internet access got a computed mean value of 2.74 which has a descriptive interpretation of “Sometimes”.

1.2 Time Management (Specific Challenges)

Based on the collected data it presents that most of the students are experiencing not having an adequate focus on online classes due to several responsibilities at home which got the highest computed mean value of 4.15 with the descriptive interpretation of “Often”, next experiencing tons of workloads of activities got a computed mean value of 4.03 with the descriptive interpretation of “Often”. For the time being, unable to manage time to practice the procedures and skills learned in laboratory subjects due to the heavy workload of other activities got the computed mean value of 3.89 with the descriptive interpretation of “Often”. Meanwhile, unable to manage and organize tasks appropriately got the computed mean value of 3.62 which interprets “Often”. Furthermore, unable to organize and manage time wisely got a computed mean value of 3.5 which has the descriptive interpretation of “Sometimes”.

1.3 Availability of technological Devices (Specific Challenges)

According to gathered data, most students are encountering difficulties when it comes to the battery usage of their device due to several hours of using it for online classes which got the highest computed mean value of 3.59 with the descriptive interpretation of “Often” next, is encountering several lagged or system glitch while using phone or laptops during virtual class got

a computed mean value of 3.44 which has interpretation as “Often”. Meanwhile, experiencing troubles with the camera and microphones of the digital device got a computed mean value of 3.21 with the descriptive interpretation of “Sometimes”. Furthermore, is incapable to purchase a much suitable device to be used for online classes got a computed mean value of 2.79 which indicates the interpretation of “Sometimes”. Lastly, has no available technological device such as cellular phones, laptops, or personal computers for virtual classes got a computed mean value of 2.24 which signifies the interpretation of “Rarely”?

1. 4. The efficiency of Power Supply (Specific Challenges)

Based on the collected data, not having a backup generator at home reaches the highest computed mean value of 3.38 with the descriptive interpretation of “Sometimes”. Meanwhile, unable to recharge the devices such as phones, laptops and even power banks due to power interruption got the computed mean value of 2.89 with the descriptive interpretation of “Sometimes”. Furthermore, having trouble reconnecting to classes due to continuous power interruptions got the computed mean value of 2.85 with the descriptive interpretation of “Sometimes”. For the time being, being unable to attend classes due to several brownouts got the computed mean value of 2.79 with the descriptive interpretation of “Sometimes”. Lastly, going to a nearby internet café or computer shop as an immediate option for Wi-Fi access due to power interruption at home got the computed mean value of 2.41 with the descriptive interpretation of “Sometimes.”

Problem 2 What are the supports provided by the school to assist the students in online learning of the laboratory subjects?

Most of the respondents said that the support that they receive from the school is ensuring that the professor is conducting classes regularly which got the highest computed mean value of 4.29 with the descriptive interpretation of “Always”. Meanwhile, maintaining the consistency of giving recognition to their student’s excellent academic performance got the lowest computed mean value of 3.98 with the descriptive interpretation of “Often”. For the time being, providing activities for students such as (reporting, return demonstration, on-the-spot Q and A, etc.) got the computed mean value of 4.15. Next, providing competent and well-trained lecturers got the computed mean value of 4.12. ensuring have adequate presentations, tools and online platforms that can be used for online learning got the computed mean value of 4.06. all these three remaining items present the descriptive interpretation as “Often”

4. CONCLUSIONS

The researchers were able to come up with this conclusion based on the findings of the study. Most students from 2nd year to 4th year Radiologic Technology course are experiencing several challenges when it comes to online learning of laboratory subjects such as internet connectivity, time management, availability of technological devices, and efficiency of power supply. Based on the findings, online learning of laboratory subjects is quite difficult for students to learn and comprehend. But with the support of the educators, they were able to surpass some of the challenges that they encounter during the online learning of their laboratory subjects. However, considering that the focus of the study is on the challenges of online learning of laboratory subjects. The missing component in the success of online learning, according to participants, was clinical support, because clinical experience and human interaction are vitally crucial for the practice of

medicine. Nothing can match performing actual skills in laboratory rooms, especially performing procedures in the simulation lab to ensure that the learners are equipped with quality education by applying their theoretical knowledge in carefully prepared hands-on scenarios that imitate diverse clinical situations within these simulation labs.

From the findings of the study, the researchers have developed a proposed solution for enhancement that may help the students to provide coping strategies that they can use whenever there is any pitfall that may arise during, their online laboratory classes. This will help students to address several challenges as well as improve their knowledge, skills, and expertise when it comes to performing the necessary procedures in diagnostic imaging or other field of medicine

5. RECOMMENDATION

To minimize the challenges in online learning of laboratory subjects experienced by the students, the following recommendations are implemented based on the results and conclusion of the study being presented.

1. Commission on Higher Education (CHED) must implement ways and strategies to make learning more comprehensive and accessible to all. Emergency Remote Teaching (ERT) delivery should not be confined synchronously. They can, however, introduce innovations such as asynchronous teaching, asynchronous activities, assigning video demonstrations of the students which will serve as their performance tasks with plenty of time before the deadline, or providing recorded demonstrations of skills or procedures, either created primarily by the professors or providing demonstration videos from YouTube, thus uploading it in Moodle portal. Thereby, the number of hours a student must spend utilizing the internet only to attend classes might be reduced.
2. For students that struggle in managing their time when it comes to balancing their academics and personal life, they can use the five-step process for task management as well as the use of three simple study and workflow strategies. Which is the use of dual screens, The Pomodoro Technique, and lastly the use of technology to encourage compartmentalization.
3. For students who are encountering difficulties regarding the use of their devices utilizing during online classes. Consequently, a solution would be is to prevent the battery of their laptops, tablets, or cellular phone from overheating. Instead of having longer hours of discussion to preclude overheating of the device, the educators could provide a recorded lecture of their live discussion, hence uploading it in the Moodle recommended solution will allow the devices of the students to get rest and recharge.
4. For students who are experiencing several power interruptions during online classes. The researcher suggests using a thermoelectric generator (TEG). particularly a candle lightning battery charge using a TEG as an alternate source of electricity can be a way to create a cheaper alternative power source. It is economical because it recycles waste heat, is a reliable source of energy, and has a lower production cost. This system could be used as a portable power source to charge a phone or other device that uses lithium-ion rechargeable batteries. As a result, it can be a viable alternative source of power for online classes.
5. The researchers recommend using "Assessment Drives Learning," which is an online formative assessment that can be conducted through several technological applications such as Socrative, Quiizzis, and Kahoot, as suggested support that the institution can provide. By using strategy, educators can engage their students in an interactive discussion. Interactivity between the educator and the learners, along with study material used for discussion, as well as emotional and social

support, can be used by educators to assist learners in their academics, which is also an essential component in an effective way of learning.

6. Another type of support that the school can provide is an orientation webinar/seminar for both educators and learners on how to use these virtual learning tools.

6. ACKNOWLEDGEMENT

In today's generation as we live in a world of COVID 19 pandemic that causes unprecedented disruption in the field of medical education and healthcare systems worldwide. It is indeed a challenge for us allied individuals to pursue and have a will to come forward and reach the goal to succeed. Research is like a bridge between theoretical and practical working, with this we would like to give our thanks to the highest of all, the almighty God, and the heavens above, who never fail to provide and give us wisdom and strength for making all these possible, the one who's always been our shepherd to the right path of life. With his endless grace, our study reaches its purpose and become reality.

This study will not be possible without the utmost and endless support, as well as the guidance of our immediate members of the family for giving us everything that we need and for giving us more than what we deserve, together with extending their valuable assistance in the preparation and completion of this study.

We would also like to express our deepest appreciation to our research adviser Ms. Cecilia J. Cardoso, the one who never failed in encouraging us researchers to give our best output and not be contented from an average, but rather be competent enough to reach the goal that we're aiming for. Thank you, ma'am, for always being our constant motivator and for always reminding us that we can achieve everything just as long as we're exerting effort and perseverance in everything we do, without her guidance and persistent help, this study would not have been possible. We also like to give thanks to our classmates in the radiology department that give us ideas and suggestions that help to strengthen our studies as well. We are giving thanks to our God, for us having these mentioned people in our life that became part of our research journey. This would not be possible without their help.

REFERENCES

Articles

Daniela, P. (2021, November 3). *Bruner's Learning Theory*. Kompasiana.com. Retrieved March 25, 2022, from

<https://www.kompasiana.com/patriciadaniela8753/6182bf94b4ab2e264e5a3492/bruner-s-learning-theory>

Badyal, D. K., & Singh, T. (2017, December Thursday). Learning Theories: The Basics to Learn in Medical Education. 10.4103/ijabmr.IJABMR_385_17

Books

Mahlangu, V. (2018, April 4). [PDF] *The Good, the Bad, and the Ugly of Distance Learning in Higher Education*. Semantic Scholar. Retrieved March 25, 2022, from

<https://www.semanticscholar.org/paper/The-Good%2C-the-Bad%2C-and-the-Ugly-of-Distance-in-Mahlangu/c3290e88376d5390063199febf97872cbeefea2>

Mateen, M. (2018, January 6). *What Happens When a Computer Overheats For Too Long?* CPUtemper. Retrieved March 25, 2022, from <https://www.cputemper.com/what-happens-when-computer-overheats-too-long>

Publish Thesis

Gaur, U., Majumder, M. A., Sa, B., Williams, A., & Keerti Singh. (2017). *Challenges and Opportunities of Preclinical Medical Education: COVID-19 Crisis and Beyond*. Link. Springer.com. Retrieved March thursday, 2022, from <https://link.springer.com/content/pdf/10.1007/s42399-020-00528-1.pdf>

ABOUT THE AUTHOR

Cecilia J. Cardoso, Ph.D. is an Associate Professor at Perpetual Help College of Manila. She finished her Doctor of Philosophy degree at Bulacan State University.

Noel J. Acosta, Ph.D. is the dean of the College of Radiologic Technology at Perpetual Help College of Manila. He finished his Doctor of Philosophy at St. Jude College, Manila