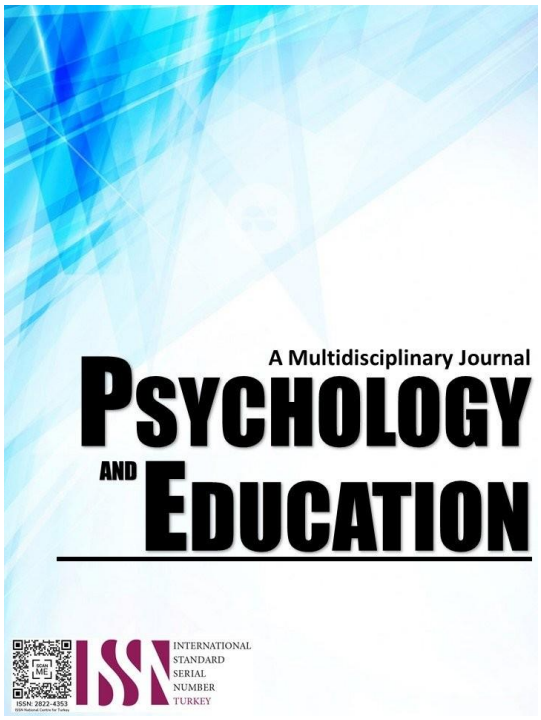
REMOTE DELIVERY OF RELATED LEARNING EXPERIENCES FOR MEDICAL TECHNOLOGY: CASES OF TEACHERS AND STUDENTS IN THREE (3) HIGHER EDUCATION INSTITUTIONS



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Research Article

Remote Delivery of Related Learning Experiences for Medical Technology: Cases of Teachers and Students in Three (3) Higher Education Institutions

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Abstract

Related Learning Experience (RLE) provides opportunity for medical technology students and interns to practice what has been learned in the classroom obtained from laboratory classes in schools, clinical laboratories and hospitals designed to advance the diagnostic competencies of students in the performance of clinical laboratory procedures. This study aimed to describe the remote delivery of the Related Learning Experiences (RLE) during the COVID19 pandemic for Medical Technology as experienced by both the teachers and students in the 3 identified Higher Education Institutions. This study utilized Qualitative Case Study Design- Multiple case embedded approach. The participants of the study were the medical technology teachers handling RLE subjects and medical technology students from the three Higher Education Institutions (HEIs) who were enrolled in Bachelor of Science in Medical Technology program. The findings revealed that both teachers and students prepare for their remote teaching and learning in RLE, and apply various strategies to teach and learn. Teachers' give assessments to students through computer software-aided assessments such as quizzes and exams, there are also online submissions required like recorded and live return demonstrations. Challenges were identified by teachers and students and coping strategies were also employed. Based on the findings, cases of teachers and students attending to remote delivery of RLE are affected with schools' sufficiency or adequacy in instructional facilities like the laboratory, learning management system and laboratory manuals. Clarity of guidelines and timely feed backing can significantly and positively affect the institution's teaching process in the remote delivery. It can be also noted that medical technology learner's performance and attitude towards learning is relatively better compared with in-person approach. As shared, they also exert effort and somehow are motivated to learn and take part on their self-learning paces because they can see their teachers' effort in teaching.

Keywords: *remote delivery, related learning experience, medical technology*

Introduction

During the pandemic, Higher Education Institutions in the Philippines have shifted to flexible online teaching and addressed issues on safety as mandated by Commission on Higher Education. This hurried move to online learning in a response to COVID19 created a situation characterized by industry leaders as "emergency remote learning" rather than online learning as stated by O'Keefe et al (2020). However, there is a need to look into the areas in the Teaching and Learning like developing specific skills behind an online learning environment where students can possibly perform the tasks without the physical presence of a teacher. In designing curricula and assessment, it is essential to ensure that teaching and learning process enhance teaching effectiveness whereby eliminating barriers to education especially among programs that require an actual face-to-face performance of the related learning experiences. The current state of alarm due to the COVID-19 pandemic has led to the urgent change in the education and among the programs that is greatly affected is the medical related programs wherein online digital tools may not be sufficient conditions to ensure the effectiveness of online teaching and learning.

A great part of the medical technology program of activity is to bring about the best learned experiences as practiced and demonstrated during actual Related Learning Experiences (RLE) from classroom settings and actual patient interactions closely supervised by teachers and clinical instructors. Related Learning Experience provides opportunity for the student-Medtech to practice what has been learned in the classroom.

The pandemic surprised most of the teachers and also the students, who were very unfamiliar with online learning platforms, by forcing them to move, in a very short time, from traditional learning to exclusively online learning. To be able to manage this situation in an imminent future, it is necessary to learn from these experiences and to define the strong and weak points of (RLE) in remote delivery. The objective of this study is to discover the learning experiences and the expectations about the delivery of the RLE in response to changes in education of 3 HEIs, when faced with the abrupt change from face-to-face to online learning education during the whole school year of confinement due to the COVID-19 pandemic.

Theoretical Lens

Constructivist theory of learning states that learners construct knowledge rather than just passively take in information. According to Barjesteh et al. (2022) in digital approach, technologies which are based on constructivism are those which allow learners maximum opportunity to interact within meaning-rich contexts through which they construct and acquire competence. Classroom activities such as pre-tests, informal interviews and small group warm-up activities require recall of prior knowledge. Assign problems like case studies and laboratory activities that will challenge students is essential to come up with conclusions and accurate interpretations. Psychological theory of learning is centered on the analysis of observable responses in their related environmental conditions. The cognitive ability enables learners to discover and document the meanings that they develop from their daily encounters. Behaviorism as defined by Klein (2012) is a school of thought that emphasizes the role of experience in governing behavior. Students will learn through the laboratory procedures taught and that initiates students to practice because they know that it is through constant practice that they can establish.

Experiential learning is the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience. As stated by Meriam (2014) Kolb's Experiential Learning Theory is a cycle of learning process where learners become effective when they are able to engage and manifest four different kind of abilities; concrete experience abilities, reflective observation abilities, abstract conceptualization abilities and active experimentation abilities.Albert Bandura's Social learning theory as described by Main 2022 is based on the philosophy that individuals can learn through observing and imitating the observable behaviour of others. Social learning theory explains human behaviour through observation and imitation. Social learning theory explains human behaviour through observation and imitation. The theory states that humans learn socially, not just intellectually. This means that learning comes from peers, parents, teachers, coaches, etc., rather than solely from books.

Research Questions

This study described the remote delivery of the Related Learning Experiences (RLE) for Medical Technology as experienced by both the teachers and students in the 3 identified Higher Education Institutions. Specifically, the study answered the following questions:

1. How may the remote delivery of related learning experiences for the teachers be described in terms of the following:
   1.1 Teachers' preparation for the delivery;
   1.2 Teachers' strategies in the delivery;
   1.3 Teachers' assessment strategies; and
   1.4 Challenges and coping?
2. How may the remote delivery of related learning experiences for the students be described in terms of the following:
   2.1 Students' preparation for learning;
   2.2 Students' strategies in learning;
   2.3 Students' experiences on being assessed; and
   2.4 Challenges and coping?
3. How may the remote delivery of Related Learning Experiences (RLE) for the teachers and students be described?

Literature Review

Related Learning Experience provides opportunity for the student-Medtech to practice what has been learned in the classroom. Clinical experience is "the means, through which a nurse learns to identify relationships in a situation, recognize the context of the actual situation, anticipate, potential problems, and perceive the situation as a whole. Progressivism states that practice alone is not enough. The process must be accompanied by understanding and interest. This justifies the adoption in the curriculum of the competency-based program, where in before the student is placed in the clinical area; he/she should possess a thorough theoretical knowledge of procedures and methods of practice (Colindres et al., 2019). This part of learning process has been much affected as well due in class suspensions especially so with online web-based approach. In the context of MT/MLS graduates, these core competencies are gained through educational programs and learning experiences especially in clinical internship programs articulated by Limjuco (2016).

Teaching as described by Fatani (2020) had an overall positive outcome on student satisfaction, and teaching quality relied on teaching, cognitive, and social presence rather than technology. In the rise of digital learning, Veletsianos (2016) pointed out that web evolved into a tool for self-directed personal development and has become a vast resource that enables one to learn and grow outside the parameters of what is considered formal learning within the four walls of a laboratory classrooms. To add, Dhawan (2020) stated that online mode of learning is easily accessible and can even reach to rural and remote

areas which also leads to self-directed personal development among learners. With the flexibility aspect of online learning; a learner can schedule or plan their time for completion of courses available online. The objective of this study is to discover the learning experiences and the expectations about the delivery of the RLE in response to changes in education of 3 HEIs, when faced with the abrupt change from face-to-face to online learning education during the whole school year of confinement due to the COVID-19 pandemic.

Methodology

This study utilized Qualitative Case Study Design-Multiple case embedded Approach. This study is particularly suitable for a case study design because it is a bounded system, it is contextual, and it is a study of process. The teacher's and student's experiences as cases and on the contexts of three Higher Education Institutions, on the remote delivery of related learning experiences in the new normal as a process and, more specifically on the preparation, strategies and assessments. This was defined by how each three (3) Higher Education Institutions through which teachers and students as individual cases experienced the delivery of RLE through online modality. This had drawn attention to the remote delivery of RLE in terms of preparation, strategies and assessments as well as the challenges and difficulties and how coping strategies were applied to address the challenges experienced. This study also developed a framework that can be formulated in the remote delivery of related learning experiences of higher educational institutions.

The researcher used the transcript during the interview through focused group discussion and data analyzed using Thematic analysis. Furthermore, concepts were drawn and extracted from the text segments. Then, these concepts were categorized into emergent themes by clustering the concepts according to commonalities of ideas to give an overall understanding of the experiences of teachers and students of three higher education institutions on the remote delivery of RLE. Finally, cross case analysis was done where themes and concepts of each case were compared and contrasted, select categories or dimensions, and then to look for within-group similarities coupled with intergroup differences.

Results and Discussion

Teachers and students in HEI 1, 2 and 3 have similarities and differences of teaching and learning preparations in their RLE classes. The formulated conceptual framework (Appendix A) describes the remote learning of Related Learning Experiences (RLE) from the experiences of both the teachers and students of the three identified higher education institutions. In describing teaching and learning Related Learning Experiences (RLE) remotely, categories emerged in the preparation, strategies for teaching and learning practical skills and their experiences on assessments. Challenges/difficulties encountered by teachers and students were looked into, so with their coping strategies to address challenges which play significant roles for effective delivery of the RLE remotely.

Teachers' preparation and strategies for the delivery

As teachers prepare for their remote teaching in RLE, they capacitate themselves by attending seminars on the use of online platforms, reading ahead, using reagents and materials from school, making video presentations and looking for teaching resources from the internet. Teachers plan for the instructional delivery of the subject by meeting with colleagues and design how the RLE should be taught online plus the assessments to be employed, they also look for alternative laboratory activities that can be possibly perform by students at home. Teachers apply strategies in teaching RLE through demonstration by exerting effort to do video recording or live online of the laboratory procedure. They also engage learners into collaborative learning strategies through online presentations as well as virtual discussions. There were identified teaching preparations and strategies to each HEIs, however, unique to HEI 2 teacher's preparation is ensuring the quality of instructional materials being prepared that will keep students motivated about the lessons presented through videos such as the agglutination reactions and reactivity of tests, this way learners can visualize the procedures on how to perform the tests. In HEI 3, teachers check and revise laboratory manuals for virtual laboratory classes. Part of HEI 3 teachers' preparation is by asking help from program coordinator on the instructional delivery policies in handling online classes and guidance for the important laboratory procedures to be done. In the 3 HEIs, teachers apply different strategies applicable to their institution's context. On the other hand, teachers in HEI 2 use the learning management system and

explore on whiteboard applications in Google meet where students can write their answers online and look for videos of machine suppliers like calibrating a machine. HEI 3 teachers do enhancement programs by allowing students to tell the teacher of the topics that need enhancement based on students' assessments.

Teachers' assessment strategies. Teachers commonly give assessments such as computer software-aided assessments like the use of computer applications in identifying parts of the microscope, administering online quizzes and answering essay questions. Graded oral recitation is also common as it involves recalling the step by step procedure, asking direct practical and objective questions. Case analyses are also given and answered verbally. HEI 2 teachers make use of case studies based on the laboratory reports while HEI 3 teachers require learners to submit projects and return demonstrations online using laboratory manuals as guides.

Challenges and coping. There are different challenges in teaching RLE through remote modality. On delivery and monitoring, student's participation and attendance were challenging to teachers. As mostly online delivery was employed, in events when intermittent internet connection happens, this affects the sufficiency of gathering teaching materials, make interactions limited and class interruptions consume the class hours. Thereafter, there is difficulty in going back to missed items in classes thus causing delay in the delivery and topics cannot be fully covered. During pure online classes, teachers find it challenging to check assessments. For HEI 1, classes are cancelled during power outages and this leads to problems on affordability of the internet among students. Some teachers in HEI 2 find it challenging attending to student's concerns and issues through chat and learners simply see the teacher's responses to their concerns thus, communication is not well reciprocated. This is also a challenge for HEI 3 but their issue is more on lost submissions due to internet connectivity Parent's involvement that interfere with the transactions poses challenge to HEI 3. Students tell different stories to their parents, and these parents will come, question the grades and do not accept the performance of students.

Teachers are able to cope with the challenges in their delivery and monitoring by way of adopting some strategies from co-teachers and acquiring another gadget. They also use the free data to announce to students like resorting to synchronous activities. To cover missed topics, teachers simplify the lesson to fit in class hours.

Teachers also address challenges differently. Teachers in HEI 1 give modules to students with difficult-to-reach locations. Some HEI 2 teachers develop patience and consider on learner's missed activities and give learners time to cope with missed activities due to Internet connectivity problems. Teachers know the exact conditions of learners and allow them to take examinations at their own convenience. To enhance their teaching skills, teachers in HEI 2 spend a lot of time in learning new skills and strategies and become more skilful in editing video presentations. On technical issues, teachers ask help from other departments especially MIS staff on the use of LMS and borrow or buy available online sources to deal with lacking technical or software knowledge. HEI 3 teachers, on the other hand, have unique ways in dealing with challenges especially in the assessments they give to learners, such as making a lot of assessments to fully gauge the performance of learner. Likewise, teachers require learners to submit excuse letter with contact numbers of parents or guardians when they are not able to submit assessments due to acceptable reasons. To address the challenges regarding the parents, teachers spend time with parents and explain to them the policies especially on grading system.

Students' preparation and strategies in their learning through remote delivery of RLE

On students' preparation in learning RLE remotely, common themes within HEI 1, 2 and 3 are self-effort on learning the skills and acquiring concepts from online discussions, seeking help from the professionals they know (close to them) who have knowledge on performing the skill, communicating with the teachers and ask the laboratory class teachers on the things to prepare and preparing the learning resources and buy materials needed for laboratory class. Meanwhile, with HEI 3 students' preparation in learning RLE, laboratory manuals are mostly used for teaching and learning. The Laboratory procedures in the manual are discussed in the lecture classes and students are asked to answer the worksheets provided in laboratory manuals. On Students' strategies in learning RLE remotely, the themes common within HEIs 1, 2 and 3 are: self-effort on recalling the procedures provided by the teachers during online discussion, self-studying through visual processing of learning materials/contextualization, keen observation of the teacher's demonstration and practicing laboratory activities and using materials available at home as alternative reagents. There is one theme unique to HEI 2, documenting the online lecture of the professors on demonstrating laboratory activities, and no actual

demonstration nor visual presentations in the laboratory classes were made.

Students' experiences on being assessed. The three HEIs have different ways of assessing students' learning in their RLE during the remote delivery, similarities are found between HEI 1, 2 and 3 and this includes: taking assessments through online platform, creating recorded videos from home and submitting online for grading and demonstrating the procedure practical live online. There are also unique assessment strategies experienced by students like having laboratory manuals as part of the evaluation in laboratory classes identified in HEI 3. However, in HEI2, most professors do not give assessments in the laboratory classes.

Challenges and coping. There are various challenges experienced by students on their remote RLE learning. Three categories similar to all HEIs, and these are: challenges on slow internet connectivity and power outage, inadequate technological resources, challenges at home as a learning environment and feeling of incompetence in learning through online. In HEI 3, there is a peculiar challenge identified, having difficulty communicating with teachers where students do not able to keep track of all the different ways of concept the teacher delivers. It can be noted that there is no unusual challenges from HEI 1 and 2. The following are various coping strategies commonly applied by three HEIs learners: using proactive and creative ways by planning and reframing activities to be done, self-regulation by instilling self-discipline to be able to cope with the increased work load, positive attitude towards the tasks given, studying independently/self-teaching, reviewing of recorded videos, improving internet connectivity to boost signal and communicating with teachers. There are unique coping strategies in HEI 3 and this is by studying independently, self-teaching and communicating with teachers.

Based on the findings, as shown in the Conceptual Framework (Figure1), teaching and learning RLE remotely provides an opportunity for students and teachers to remain connected and engaged utilizing electronic technologies to access educational curriculum outside of the traditional classroom and exerting efforts to work from their homes. Schools with sufficient or adequate instructional facilities like the laboratory, learning management system and laboratory manuals have significantly and positively affect the institution's teaching process in the remote delivery. It can be also noted that medical technology learner's performance and attitude towards learning is relatively better compared with in-person approach. As shared, they also exert effort and somehow are motivated to learn and take part on their self-learning paces because they can see their teachers' effort in teaching. On the contrary, a school with limited facilities, laboratory materials and manuals has also somehow affected the efficiency of their delivery of RLE during the remote modality and the learners' performance as well.

During remote teaching and learning, the home played an essential role in the process. Evidently as experienced by the participants, particularly on the part of the learners, the following were deemed necessary: Support of the family especially on the procurement of the learning equipment such as laboratory materials, printers, apparatuses and other essential gadgets. It also came out that, the home structure and setting is also contributory to effective learning. Home structure and setting includes the roles and responsibilities of the learners at home in doing some errands, spaces for learning activities and the family structures. The geographical locations of the home have also implications to the efficiency of the internet facility which considerably impact learners' participation and performance in demonstrating the skill required for them to exhibit.

The study revealed the role of the school in facilitating and guiding the learning process. This begins with management of the virtual classrooms considering the class schedule, class size, class structure, guidelines and policies on remote learning. The school's obligation on providing the necessary facilities such as the laboratories for reagents and supplies, and other learning materials like the laboratory manuals are necessary part of planning of the school administration. Since some teachers were doing virtual class in schools, the internet infrastructure had to be considered.

The framework shows the essential role of teachers in the remote delivery of RLE. Teacher's competence, skills and knowledge on the content influence students' learning. Pedagogical competence of teachers involves virtual classroom management- how they provide guidelines and directions for the learners to cope with the demands of the remote learning. The framework also shows that teacher's innovativeness, creativity and willingness to embrace technology in teaching are significant factors in the delivery of remote teaching of the RLE.

Learners themselves were the core components of the process. Their own attitude towards learning

contributes to their own success in the acquisition of the skills. Based from the framework, learning necessitates self-effort, resilience to adversities, collaboration with peers and other experts. It also requires resourcefulness, innovativeness, openness and inquisitiveness. These are the emerging traits that described learners on their coping with remote learning of the related learning experiences required for them to demonstrate.

Conclusion

In this study, it can be noted that schools as Higher Education Institutions have influence on the teachers' experience of teaching related learning experiences during remote learning which is described through their preparation for teaching, pedagogical approaches or strategies employed, assessment for learning, challenges and coping. Based on the findings, cases of schools with sufficient or adequate instructional facilities like the laboratory, learning management system and laboratory manuals significantly and positively affect their own teaching process in the remote delivery. It can be also noted that the medical technology learners' performance and attitude towards learning is relatively better. As shared by learners, they also exert effort and somehow were motivated to learn and took part on their self-learning paces because they can see that their teachers' effort in teaching remotely. On the contrary, a school with limited facilities, laboratory materials and manuals has also somehow affect the efficiency of their delivery of RLE during the remote modality so as learners' performance is affected as well.

In essence, this study provided a picture of how teaching and learning takes on in the remote environment particularly on the delivery of skill-based subjects in medical technology courses in response to the intention to push through education despite the pandemic. As mentioned, preparedness and efforts exerted by schools have influenced the teaching delivery and the learning of students. Clearly, with what these schools had done and continue to do, remote delivery of skill related laboratory subjects are still viable and successful with some provisions on the preparedness of the institutions and the sufficiency of various instructional support.

In terms of managing degree programs such as medical technology, the study revisited and reconsidered the curriculum content in laboratory classes wherein Related Learning Experience (RLE) happens, to fit into the needs of students who are into remote modalities. Both teachers and students need to be fully supported with effective remote education resources and address the focus on delivering alternative learning methods for those students who do not have similar opportunities in skill enhancements. The competency level should be aligned to assessment and knowledge contents which student should acquire as part of the learning process. Feed backing in remote delivery of instruction has to be strengthened likewise. Although, education institutions today have already transitioned back to face-to-face learning or blended, remote teaching and learning modalities remain as viable options for institutions in delivering of teaching and learning.

The remote modality scenario may not only be applicable as a response to pandemic. It can also become an acceptable practice on the teaching delivery of related learning experience in laboratory classes handled by teachers. For the students, it was shown based from the narrative and experiences of the students how the set-up had also provided them with the opportunity to enhance self-learning approaches, becoming more critical and creative and resourceful in their learning. Thus, every academic institution needs to capture this teaching-learning approaches and nurture these laboratory skills developed among medical technology learners through constant guidance, provision of supportive environment for remote learning modality.

Insights

Remote learning is a form of distance education which Higher Education Institutions considered to be the only means to continuously deliver teaching and learning during this Covid-19 pandemic period. It is necessary to take measures to prevent problems in delivering instruction that may arise in such pandemics or in emergency situations. The primary value of distance education is not a permanent replacement for local, face-to-face teaching and learning. Rather, it is a set of possible strategies, which can be used by educational organizations to overcome a temporary or long-term separation between teachers and learners. At its core, the goal of distance education is to increase access, not to compete with the traditional mode of teaching and learning. It is an immediate solution to continually deliver educational instruction amidst this COVID19 pandemic. According to Picciano (2022), pandemic online instruction is pedogically weak, but this is expected when teachers are learning new skills that are different from the traditional in-person teaching.

Teachers and students will then develop their blended teaching and learning skills, not only to meet the immediate demands of pandemic emergency remote instruction particularly the pressure to launch online courses , but also improve the instructional delivery among degree programs that require an actual performance of RLE and in the best long term interests of students. Although, innovations have always been encouraged and implemented, Higher Education Institutions have tried to cope with the needed digital transformation in order increase efficiency and improve the quality of teaching-learning process.

As stated by Becker and Denicolo (2013) in a laboratory setting, the teaching will allow visual aids in the form of demonstrations. This is essential in medical technology courses wherein laboratory procedures with reagents and materials are performed during actual Related Learning Experiences (RLE) enable students to achieve the competency skills required of them. In the guidelines on teaching demonstration, Price and Nelson (2019) suggested that each step of the component in a laboratory experiment or the behavioural skill, needs to be modelled clearly and correctly. So there is a need to rehearse in advance. Following the explanation and demonstrations, the students must carry out the behavioural skill by performing and receiving feedback. Performing the skill means acting it out not just discussing it or writing about it. A teacher needs teaching aids and the preparation and use of them is therefore an integral part of getting ready to teach and develop oneself as an educator or a clinical instructor.

In managing degree programs, it is essential to facilitate the rapid teaching and learning design and implement adaptive responses to enhance the teaching skills of teachers and develop learning competency opportunities for students. On feed backing, according to Gottlieb (2022), there should always be transparency in reporting assessment results. Feedback helps all individual learners to understand the skill they need to build and gives them clear guidance on how to improve simulation procedures. Generally, the teachers of the three HEIs were not able to assess the skills in actual in remote instructional delivery. Irrespective of how assessment is communicated, it needs to be valid, timely, constructive, and specific to the learning needs of a learner like a Medical Technology student. There is also a need for quick action and delivering of feedbacks to the learner and for him to gain information that helps him identify confusions, get guidance on how to improve, and understand the goals of the learning process, and finally provide remedial support if needed.

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