

# Nursing Students' Perceptions of Technology-based Cooperative Learning: A Qualitative Study

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**Abstract:** Technology and innovations continue to progress in the 20th century, thus their applications to different aspects including education are evolving. The vast presence of technology-based education has supported evolved norms in education. Nursing programs, as part of the healthcare environment, are included in the fields that utilize this method with the integration of cooperative learning. In this exploratory qualitative study, themes were derived from the analysis of focused group interviews to address the research questions. Using the inductive method, three main themes, each with one sub-theme, emerged to find the perception of nursing students on technology-based cooperative learning in their education. The findings of the study unveiled that technology-based cooperative learning is effective for the interpersonal skills, positive interdependency, and processing of nursing students in analyzing medical assignments and tasks instead of the fragmentary acquisition of knowledge. Though faced with several challenges, students believe that refinement and upgrade in educational tools will foster greater competency in learning.

**Key Words:** technology-based, cooperative learning, nursing education

## 1. INTRODUCTION

Technology and innovations continue to progress in the 20th century, thus their applications to different aspects including education are evolving. Contemporary educational policy, curriculum designing, and instructional pedagogy have been profoundly affected by impressive new global information and communication technologies (Mellati, 2019). These are not limited to a specific discipline but apply broadly across various fields, especially healthcare, including nursing education. The complexity of globalization, health issues that go beyond national borders, and the challenges associated with rapid geopolitical change, highlight the importance of preparing the future nursing workforce for global healthcare challenges (Gakumo 2021). Educators are essential in preparing future health professionals to meet the growing demands of healthcare services. They need to provide students with the technical knowledge required for their careers and the skills to improve client care quality. The quality of a nursing education program is closely linked to the excellence of its curriculum, faculty, and resources. Resources like teaching materials and facilities are essential in supporting instructors in delivering effective nursing education. The continuous improvement in the quality of nursing education programs is essential, especially in the Philippines, where most of the healthcare providers in the nursing profession are exported to developed countries such as the United States of America and Germany (Appiah, 2021).

To develop those skills, educational institutions would need to consider using innovative teaching methods to ignite the passion for learning and provide students with the opportunity for active learning (Handeland, 2021). Previous studies have suggested that cooperative learning is one of the key teaching and learning strategies to meet the said purpose (Nirvani et al., 2020). Cooperative learning provides nursing students with opportunities to learn and practice cooperation and helps to improve students' professional knowledge and skill performance as well as academic success, problem-solving, critical thinking and interpersonal skills and helps to create quality health care (Won et al., 2021). Cooperative learning (CL) is an evidence-based teaching strategy and a structured approach with a global perspective that are integral to nursing education.

In cooperative learning, teachers structure students' interactions and prepare them for cooperation so that students work together in small groups supporting each other's learning processes (Mohammad et al., 2022). The cooperative learning environment is established to assist students to reduce their reliance on authority, increase recognition of peers as legitimate sources of learning, and help raise self-confidence levels of students (Muellerjoseph et al, 2013). The implementation of CL in nursing education is important because the main mission of nursing education today is to educate professional nurses (Nirvani et al., 2020) who have the required knowledge, attitudes, and skills to maintain and expand public health (Magg, 2006). The cooperative learning method, which is necessary and important for both nursing and other health professionals, reveals effective results in academic, social, psychological, and measurement-assessment dimensions. In academic terms, it supports students' critical thinking, verbal communication, taking



responsibility for learning, and maximizing their knowledge; in social terms, it supports students' social interactions, ability to take responsibility, leadership, and cooperation skills; in psychological terms, it supports their self-esteem development; and in terms of measurement and evaluation, it provides instant feedback to the student by including various evaluation techniques (Akçoban, 2023).

The shift from traditional pedagogy to technology-based cooperative learning necessitates new approaches to teaching, learning, and the roles of educators. To be effective in digitally mediated teaching, educators must understand how to create suitable digital environments that support both collective and individual learning. The operation of cooperative learning is smoother through information technology, and a communication and interaction bridge can be built through information technology so that cooperative learning could cultivate students' problem-solving ability to further promote learning satisfaction. (Wu et al., 2022). Information-technology-integrated instruction with multimedia equipment and materials means teaching and learning is no longer restricted to dictation and paper-and-pencil (Keramati, 2022); the class climate has changed to cooperative learning. Today's generation of students have been coined Millennial learners or the Net Generation, because they have been raised in a media-rich environment and live in an information-centric world (Zhang 2021). Online learning is a product of technological innovations that provides flexibility for accessing study materials from anywhere and gives endless access to educational resources. Changes from traditional learning to online learning have a major impact on learning systems. Technology-based cooperative learning exists when the instructional use of a computer or technological method is combined with the use of cooperative learning groups. Students are assigned to cooperative groups, usually consisting of two, three, or four students, are given a cooperative assignment to complete a task in which a computer is to be utilized. It is also widely perceived as beneficial by students in offering flexible and self-directed learning regardless of time and place (Soyfan, etal, 2024)

This study sought to determine the effectiveness of technology-based cooperative learning in nursing education with the following questions:

1. What are the impacts of technology-based cooperative learning being integrated into nursing education?
2. What are the challenges of applying technology-based cooperative learning in nursing education?
3. What can your institution do to enhance the integration of technology-based cooperative learning in the nursing program?

## **2. METHODOLOGY**

### **Research Design**

The exploratory qualitative study design used focus group interviews (FGIs) to explore nursing students' perceptions of technology-based cooperative learning as part of the nursing educational program. The focus group interview (FGI) is considered a useful technique when the goal is to explore the opinions, attitudes and beliefs that arise in interaction with multiple participants (Malterud, 2012). This method has increasingly been used in nursing research to explore key stakeholders' perspectives and experiences of teaching and learning (Jayasekara, 2012). The FGD took place between February and April 2024 and comprised of eight (8) nursing students with different year levels were divided into 2 groups. In-depth structured interviews were conducted that lasted 45 to 60 minutes. The participants received information about the process of the FGD, privacy issues, allocated time, and the informed consent form.

The data analysis followed Braun and Clarke's (2006) six-phased approach, which includes familiarization with the data, generating initial codes of the responses from the participants, searching for themes that categorized them into relevant themes that suit the objectives and fulfill the study's research questions, reviewing themes, defining, and naming themes, and producing the report. The grouping and categorization of the data were done in conformity with the patterns, and affinity was discerned through the answers of the participants.

### **Ethical Considerations**

The Researchers presented the purpose and procedure of the study to the participants. Participation was voluntary and written informed consent was obtained from all participants. All data have been anonymized and securely stored.

## **3.RESULTS AND DISCUSSION**

What are the impacts of technology-based cooperative learning being integrated into nursing education?

### **Theme 1. Access to learning resources**

#### **Resources and tools**

Participants find that technology enabled the learners of nursing education and other medical fields to have vast access to resources for their studies. Incorporating cooperative learning added an advantage in understanding medical concepts and healthcare practices given different learning processes. As mentioned in the work of Dendup (2020) cooperative learning helps students to improve their thinking skills, ways of collecting information from various sources, giving arguments, and appreciation among each other. Students work together on how to record medications and charts on a device and understand specific medical terms. Google



Scholar, Google Drive, Google Docs, and digital library access to journals were some platforms used by the participants in their research and references. The functions of these productivity tools supported the students' collective work. Member reliance is frequently observed particularly in instances where one member possesses digital literacy. The participants believed that this is a positive interdependence an established principle of cooperative learning principle. Google Docs became a silent collaborator for the students. One participant mentioned *"It's easier for us to create paperwork. We don't need to use our hands anymore. It's easier for us to pass it through Google Docs."*

E-books are also preferable to nursing students than traditional books, they lessen the time to browse through the pages and proceed to the topic they need to read. The participants find this learning methodology as very essential even post-pandemic routine in providing learners constructive way to comprehend the subject matter. Group outputs require less effort since technology has aided in communication and the creation of required outcomes. Some participants indicated that incorporating technology-based cooperative learning into the process of doing their assignments reduces incomplete work. It somehow facilitates collaboration among students by providing platforms where they can easily communicate, share resources, and work on projects together regardless of their location. Access to collaborative documents, discussion forums, and project aid software enables nursing students to pace their contribution in such a way that the work is continuous yet manageable.

Different technological communication channels like social media and Google Meet have saved them time and effort to gather and meet. Stronger ways to communicate with group mates and even with their patients were achieved through online communication. They have also experienced participating in meetings, seminars, and discussions without the need to go to a venue. As stated by one participant, *"Actually, even now, recently, there's an orientation for the hospital. The communication is faster, and we don't need to set up a meeting to go here. So, in terms of resources, you don't need to spend money."*

The learning method also improved their interpersonal skills whether face-to-face or online meeting. Having tasks that need to be accomplished in groups allowed them to improve their social skills, emotional intelligence, and network. Remarkd by one participant, *"That's why if we have Google Meet, we can easily share our ideas and we can ensure that everyone can understand each other."*

Another participant stated, *"What I like the most in our cooperative technology education is that even if it's not physically face-to-face, we can still have interaction because we are still making the students and other people feel that we are talking to them face-to-face."*

Findings revealed that when the nursing students cooperated in groups, they practiced several skills together. CL allows students to analyze problems via multiple perspectives, and this helps them to think in more complex ways (Loh, 2020).

What are the challenges of applying technology-based cooperative learning in nursing education?

### **Theme 2. Digital difficulties**

#### **Filtering information and multi-connection**

The participants identified several challenges in having technology-based cooperative learning that occasionally hindered tasks and joint assignments. Unstable internet connection, a large-scale issue in the country especially in the provinces, is a crucial element that takes account of their challenges. Since tasks are highly dependent on using internet connectivity, the learning process needs to be adjusted in cases of its absence. A notable issue is pervasive in developing nations, particularly in the Philippines, as supported by several studies. The most prevalent obstacles faced by nursing students were infrastructure and technology, technical and management support, and instructors' characteristics while the least obstacles were the curriculum content and learners' characteristics dimension as reported by nursing students. The majority of nursing students reported the lack of infrastructure at the nursing faculty to provide guidance, counseling, and training before using an e-learning platform, and low bandwidth connections with frequent breakdowns also, the e-learning system design is not flexible and difficult to use (Gehan, 2020).

If there are members who experienced this problem, then it affects the whole group working on collaborative assignments. furthermore, digital incompetence for some students is apparent since not everyone has proficiency in platforms, software, and productivity tools that can assist them with their required output. This tends to prolong the time required to complete the tasks. One participant cited *"I hope there are more computer subjects related to nursing that we can use and make us knowledgeable about technology"*

With open resources, there were instances of unverified information and even misleading information. Inputs of several members in formed groups are hastily done which can affect the output. Some do not validate the information from what was taught inside the classrooms. This is a crucial element as nursing students need to provide the right information to their patients. Students from nursing education also find some challenges in interaction. Some difficulties were revealed during online communication. There are instances of ignored messages, lack of emotion in interaction, and also a brief span of attention. However, this kind of communication also works for some who may consider



themselves introverts. The opportunity to relay messages and output in group works is delivered without the social demand.

What can institutions do to enhance the integration of technology-based cooperative learning in the nursing program?

### **Theme 3. Innovation on learning Upgrade**

Participants appreciated the integration of technology-based cooperative learning as pedagogy in nursing education but can be improved in their institution. Several suggestions were given to enhance these learning methods. Nursing students believe that seminars and webinars on technology pertinent to nursing education should be conducted for both students and teachers. The nursing program involves different generations, thus, the awareness and proficiency of individuals are on different levels. Having digital competency for everyone in the academic and medical field will be beneficial to the program and curriculum. There are also devices and innovations that are very useful and will develop their skills for the medical environment. Exploring these through cooperative learning will revel in the learning environment. A participant expressed, “ *We hope we can have a 3D model where you can see the in-depth parts of the anatomy. You can watch that on Grace Anatomy.. The one that's high. We can touch and work on analyzing together*”

Several reviews found that simulation activities in education are often practiced using various role-playing scenarios that can include patient simulators, trained individuals acting as patients, manikins or computer software (Handeland et al., 2021). An upgraded human patient simulator that will be analyzed with their group will further improve their knowledge and mastery of clinical proficiency more than watching YouTube videos alone. Considering another principle of cooperative learning, processing out is well developed if students will examine such medical assignment. Another suggested elevation is the inclusion of a 3B smart anatomy model in a cooperative learning condition will facilitate better examination and and improve comprehension of anatomical images. This allows the broadening of views and learning is leveraged through synergy in the classroom.

## **4.CONCLUSIONS**

The findings of this study revealed that participants generally perceive technology-based cooperative learning as beneficial and more appropriate in this internationalized and digital world. This pedagogy is important to nursing education and to the endeavors of both students and teachers in public health who need to enhance their expertise, cognition, and demeanor. As stated by Männistö (2020) these approaches can help students achieve learning objectives and allow the monitoring and understanding of students' knowledge acquisition and nursing skills development.

To provide such support, sufficient competence in teaching in digital learning environment is essential, and our study highlights clear needs to enhance this competence. There would be a need to develop educators' skills and to raise awareness of digital teaching tools and how to use them. The best way to improve the skills of social and healthcare educators has not been directly demonstrated. Continuing education is one way, but it alone does not guarantee an improvement in skills. Therefore, it would be important to identify best practices to ensure high-quality education at all levels of education and in continuing education (Männistö, 2020).

In this modified societal landscape, having meetings and communicating with classmates, professors, and clinical instructors are more convenient through different communication channels. Integration of this learning method has improved the interpersonal skills of some participants who were able to convey their views despite the reserved condition. For students who are too shy to ask teachers questions, cooperative learning provides them a platform to seek clarification from their peers. Some studies found that students learn better through peer explanation, as they can translate teachers' language into peer conversation (Pålsson et al. 2021)

Students also stressed that technology-based cooperative learning equipped them with encoding medical charts and records, a better understanding of medical terms, and practice nursing skills. Findings revealed that when the nursing students cooperated in groups, they practiced several skills together. CL allows students to analyze problems via multiple perspectives, and this helps them to think in more complex ways (Pålsson et al. 2021).

However, results stated that the broad problem of internet connection still exists as a hindrance to implementing and undertaking this learning method. Instances of irregular connectivity interrupt or slow down digital learning and completion of tasks. These findings are in the same line with Gehan (2020) who found that technical support services will motivate the continuity of technology-based learning in nursing education. It was reported that one of the main barriers to the use of technology learning is technical difficulties such as lack of technical support, poor and outdated computer systems, and connectivity issues.

The study also showed insights that technology-based cooperative learning can be effectively implemented with several upgrades and supplemental strategies. Seminars, and webinars for both teachers and students to enhance and be well-informed or proficient in global trends. It is also deemed that more computer-related subjects should be incorporated into the curriculum to keep them well-versed in the digitization of public health and educational innovations.

Similarly, upgraded mannequins and simulators are solicited to further increase interest and motivation in learning. Simulation Technology-based learning may be particularly appealing





to students, viewed as an effective method for adapting students to the clinical environment during nursing education (Edward et al., 2020). Sim-Tech enables students to experience a practice environment that resembles real-world situations, including patient responses, which can improve the accuracy and precision of nursing skills and interventions (Kourakos et al., 2020;). Processing out of such tasks minimizes the time and effort required for students and creates measures to foster competencies.

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