

**PERCEPTIONS AND INTENT OF SECOND YEAR DIRECT UNDERGRADUATE  
NURSING STUDENTS TO USE VIDEOS FOR LEARNING CLINICAL SKILLS: A  
CASE OF A PRIVATE FAITH-BASED UNIVERSITY IN CENTRAL UGANDA**

**KARIM MWANGA**

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**UGANDA CHRISTIAN  
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**Declaration and Approval**

I, **Mwanga Karim**, a student at the **Uganda Christian University (UCU)**, hereby declare that the work presented in this protocol, titled *“Perception and Intent of Second-Year Direct Undergraduate Nursing Students to Use Videos for Learning Clinical Skills: A Case of a Private Faith-Based University in Central Uganda,”* is original and has never been done or presented for any academic award in any institution. This work will be prepared solely for academic purposes and has never been, nor will it be, submitted elsewhere for any reason other than academic purposes.

Name:.....Signature:.....Date:.....

**Approval**

This work has been submitted with the approval of my supervisors.

1. Name: ... Nakate Mary Grace .....

Signature: ...  .....

Date: ... 3/04/2024 .....

.....

2.

Name: .....

Signature: .....

Date: .....

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**List of Abbreviations**

BNS	Bachelor of Nursing Science
CAUTI	Catheter-Associated Urinary Tract Infection
eICU	Electronic Intensive Care Unit
EFL	English as a Foreign Language Course
ICT	Information and Communication Technology
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
TAM	Technology Acceptance Model
MOH	Ministry of Health
NCHE	National Council of Higher Education

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## **Operational Definitions**

**Clinical skills** are the essential nursing capabilities necessary for excellent, safe and cost-effective nursing maintenance through clinical nursing education (Perry, Potter, Ostendorf, & Laplante, 2021).

**Intent** in this research will mean how the students plan to use training videos to learn clinical skills.

**Learning** is the transference of sensed, perceived and attended data into long-term memory (Mayer, 2002).

**Nursing** is a practice-based profession which, by definition, means that clinical skills and exposure to the clinical area are essential parts of nursing education (Twentyman, Eaton, & Henderson, 2006).

**Perceived ease of use** refers to the degree to which a person believes that using a system will be effortless (Davis, 1989).

**Perceived usefulness** is defined as the degree to which a person believes that using a system will improve his performance (Davis, 1989).

**Podcasts** are defined in this context as a series of audio or video digital media files that are uploaded via the internet and are made available for downloading via a mobile information technology tool for listening or viewing as desired (Chan, 2014)

## **Abstract**

This study investigated the perceptions and intent of second year direct undergraduate nursing students to use videos for learning clinical skills at a private faith-based university in Central Uganda. Using a one-group pretest-post test design, the study assessed students' perceived ease and usefulness of training videos before and after a teaching session on urinary catheterization, and their intent to use videos for future clinical learning. Findings indicated that students generally found videos easy to use and somewhat useful, though engagement and perceived practical application were mixed. Post-intervention and ease of use slightly improved, but with the intention to adopt videos remained largely unchanged. However, skill levels significantly improved, with all students rated "Excellent" after the training. The study recommends integrating interactive and updated video content into nursing curricula as part of a blended learning approach, supported by practical sessions and continuous evaluation.

## **Chapter one: Introduction**

### **Introduction**

Recent developments in technology have had a profound influence on tertiary institutions globally (Chugh et al., 2023). This impact is particularly evident in the realm of health education where there is a noticeable trend towards the incorporation of online, mobile, and handheld technology, as highlighted by Singh et al. (2021). The catalyst for this transformation was the COVID-19 pandemic, which forced institutions worldwide to close their physical campuses and ushered in a new era of video-based learning (Tosto, et al., 2023). Before the pandemic, many educational institutions preferred blended learning, which involved combining traditional teaching methods with various Information and Communication Technology (ICT) tools and solutions (Bashir et al., 2021).

Traditional teaching methods refer to teacher-centred teaching methods which focus on explaining topics in a textbook using lectures or reading text whereas non-traditional teaching methods are student-centred and inspire curiosity, and creativity, and encourage students to participate in class activities (Safapour, Kermanshachi, & Taneja, 2019). Traditional teaching is also known as lecture-based or didactic approach. However, the pandemic accelerated the adoption of non-traditional methods such as electronic-based learning methods including videos, revealing their effectiveness, especially in medical education (Ayoub et al., 2020).

Nurse educators have expressed a growing inclination to incorporate technology, particularly training videos, into nursing curricula to enhance students' knowledge and skills (Öztürk & Dinç, 2014). This shift is deemed crucial, as highlighted by Clerkin et al. (2022) who identified training videos as indispensable tools for teaching psychomotor skills to nurses and midwives.

Training videos provide learners with the opportunity to observe procedural demonstrations, fostering confidence and enriching their knowledge. However, there is unclarity regarding the students' acceptance, use and perceptions concerning the use of training videos to learn clinical skills. Additionally, Huitt (2011) emphasizes the need to investigate the students' perspectives on instructional videos, given that these perspectives might influence the students' acquisition of both practical skills and theoretical knowledge.

In light of the limited literature particularly focusing on the perceptions and intentions of nursing students in the context of a private faith-based university, this study will investigate the perceptions and intent of second year direct undergraduate nursing students to use videos for learning clinical skills. By doing so, it endeavours to contribute valuable evidence that can inform nurse educators about the specific perceptions and intentions of their students regarding the integration of video-based learning into their education. This chapter provides an overview of the background, problem statement, objectives, research questions, scope, justification, significance, and conceptual framework of the study.

## **Background**

The use of training videos in training clinical skills started way back in prehistoric times when cave instructors used 16mm projectors to show students examples of insurance companies marketing commercial business (Brame, 2016). In contrast, nursing skills have been taught in theory, followed by a demonstration by the instructor, and later the student doing a counterdemonstration to perfect the skill, other methods include direct observation in clinical areas and direct hands-on patients (Ngozika et al., 2023). However, the skills lab and the methods used can only manage a maximum of 20-25 students especially in low- and middle-income countries where resources are very scarce (Lewis et al., 2019).

With the increase in student numbers in care institutions, students may not learn skills well with demonstrations and worse still, their delivery in real-time leaves the learner only

able to watch the demonstration once (Mupa, Chinooneka, & Practice, 2015). Many studies agree that clinical skills training videos are an effective approach to teaching clinical skills, as they allow the learner to combine theory and practice and increase learning autonomy for the adult learner (Coyne et al., 2018; Won & Kyong-Jee, 2014).

According to Elcokany et al., 2021, the use of technology in nursing education is a global trend to support the development of psychomotor clinical skills which are critical to patient care. Instructional strategies that include videos provide a visual demonstration of clinical skills in a simulated, real-world setting, provide context for the skill, and allow students to experience the achievement of the skill by linking classroom learning to clinical practice (Cardoso et al., 2012; Chewaka Gamtessa, 2021; Sowan & Idhail, 2014). Ensuring a high level of proficiency in clinical skill acquisition through video can improve student performance, patient safety and comfort, reduce healthcare costs and reduce patient morbidity and mortality rates (Hibbert et al., 2013).

Using video to teach and learn clinical skills in nursing can be a promising direction, hence the need to document students' perceptions and intent to use after training them. There are many different Nursing clinical skills that students learn at school. However, for this research, the researcher will only concentrate on one skill: that is Foley catheter (female) insertion. Urinary catheterization is an invasive procedure that requires sterile and aseptic techniques. Nurses carry out most of this procedure; for this reason, they are required to have the knowledge to perform catheterization in an aseptic way (Teshager et al., 2022). The proposed Foley catheter skill video will include verifying orders, preparation of the patient, inserting the urinary Foley catheter, review and documentation as well as appropriate delegation of the procedure.

Just like other African countries, Uganda faces many challenges such as the lack of a full-fledged ICT health infrastructure, knowledge gaps in ICT education among students and

teachers, and a poor population who can use personal ICT devices (Kiberu, Scott, & Mars, 2019; Kibirige, 2023). However, education in Uganda faces a new challenge of acknowledging the growing importance of technology and the need for a computer-savvy population (Nyakito et al., 2021). This has motivated the Ministry of Education and Sport and the Uganda National Council for Higher Education (2010) in Uganda to push for the establishment of computer labs and a computer curriculum in nursing schools. This initiative has improved as the number of schools receiving computer lab equipment increases (Ministry of Education and Sports, 2013). The state and schools lack the information on how to successfully manage this transition. No blueprint is available for involving school staff, students, and administration. Schools also lack technical skills and training in using devices (Markon, 2013).

Video instruction has widely been used in the past as a supplemental means of instruction to expand students' understanding of content to promote observational learning and to provide additional context (Buzzetto-More, 2014; Miner & Stefaniak, 2018). Whereas video tutorials are learner-controlled and need-based, they have been primarily used for the development of psychomotor skills but not for the development of critical thinking and clinical judgment skills (Sharpnack et al., 2013). As such, there is a need to better document the current research to harness the use of videos for teaching and learning clinical skills in nursing as a promising direction to pursue.

Instructors determine the presentation style of the videos they use as learning tools. These were assigned into four distinct styles namely, lecture-based, enhanced, supplementary and worked examples. Lecture-based videos also described as replacement or substitutional videos, are simply recordings of an instructor's entire lecture and are used to provide access for students who could not attend the face-to-face presentation (Kay, 2012). Enhanced videos provide information to the students with additional explanations. In its simplest form, an

enhanced video might be the instructor providing a narrative (descriptions, discussion points, additional information) voiceover to a PowerPoint presentation (Holbrook & Dupont, 2011).

Supplementary videos are videos intended to complement the core learning objectives and may include a capture of a live demonstration (a laboratory experiment), summaries of class assignments, and an understanding of the material (Buzetto-More, 2014). Problem-solving videos depict worked examples, provide explanations that students may need to reach a solution; and are often used in mathematics or science (Kay & Kletskin, 2012). Interactive video technology refers to the technology used by instructors that enables students to interact with video content itself through a variety of modalities such as clicking, dragging, scrolling, gaming, immediate response systems, videoconferencing, or gestures. Telehealth is another example of interactive video technology that can be used in online nursing courses and relates directly to current technology use in the healthcare sector (Marsh et al., 2010).

Students learn better when they perceive the learning environment in the class positively. Pre-conceptions and preferences of students regarding the medium for instruction affect student performance (Miner & Stefaniak, 2018). It is therefore interesting to explore whether the learners are attuned to the new methodology, would prefer any modifications, and or rather would want to go back to conventional learning altogether. It has also been reported that online video instruction should support, rather than replace, lectures, and they should be provided with a narrative that matches the presentations given face-to-face (Buchanan et al., 2011).

The Bachelor of Nursing Science (BNS) program prepares multi-skilled Nurses with different competencies to meet the healthcare needs of the community through the provision of preventive, rehabilitative, promotive, and curative services to the communities. A combination of theoretical learning with clinical competence ensures effective delivery of nursing care. The expected outcome of the BNS program is that students will be able to

perform a variety of clinical skills with competence and confidence. This includes the ability to insert a female Foley catheter and the procedure of dressing a dirty wound. The use of training videos is a potential way to help BNS students learn these skills. Videos can provide students with a visual representation of the procedure, which can help them to understand the steps involved and to identify potential errors. Videos can also be used to provide students with feedback on their performance.

In this study, focus was put on one clinical skill: inserting a female Foley. The procedure of female catheterization is an intimate one, requiring the coordination of complex psychomotor skills to reduce the risk of catheter-acquired urinary tract infections (CAUTI) (Whitehead et al., 2013). The study assesses the perceived ease and usefulness of using training videos to learn the procedures of inserting a female Foley catheter. The study also assesses the impact of using training videos on students' performance of these procedures.

### **Problem Statement**

The increasing diversity among today's nursing students necessitates the adoption of flexible and engaging teaching approaches that accommodate varied learning styles, thereby enhancing student engagement and promoting a more adaptable learning environment (Bednarz et al., 2010; Ropponen et al., 2023). Instructional videos have emerged as one such innovative method, offering visual, repeatable, and self-paced learning experiences that align well with the needs of modern learners (McGarry et al., 2015). Despite their potential, there remains limited understanding of the factors that influence student acceptance and use of instructional videos, particularly in the context of learning clinical skills (Abu-Al-Aish & Love, 2013).

In Africa and specifically in Uganda the adoption and integration of video-based education into clinical training is still emerging. There is a notable gap in research on

students' perceptions, acceptance, and intent to use training videos for clinical skill acquisition. While Sub-Saharan Africa has a growing body of literature on clinical education, approximately 50% of published papers are concentrated in this area, indicating a need for more research that informs best practices for clinical training (Bvumbwe & Mtshali, 2018; Greysen et al., 2011; Talib, Narayan, & Harrod, 2019).

Moreover, although many students today are digitally literate and regularly engage with technology, educators may be hesitant to integrate video-based learning tools without a clear understanding of students' willingness to adopt them. Given the potential of training videos to provide flexible, personalized, and competency-enhancing learning experiences (Zhang et al., 2006), there is a need to explore students' perceptions and intentions regarding their use in nursing education. This study therefore aims to address this knowledge gap by being the first to assess the perceptions and intent to use training videos for learning clinical skills among nursing students in a Ugandan university context.

## **Objectives of the study**

### **General Objective**

The general objective of this study is to investigate the perceptions and intent of second year direct undergraduate nursing students to use videos to learn clinical skills.

### **Specific Objectives**

- i. To assess the perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization before a teaching session on training videos.
- ii. To evaluate the perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization after a teaching session on training videos.

- iii. To determine the intent of second year direct undergraduate nursing students to use videos to learn clinical nursing skills after a training session.

### **Research Question**

- i. What is the perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization before a teaching session on training videos?
- ii. What is the perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization after a teaching session on training videos?
- iii. What is the intent of second year direct undergraduate nursing students to use videos to learn clinical nursing skills after a training session?

### **Justification**

The research agenda has been more focused on sensitization and training on the use of resources such as the Internet. Literature on the use of video-assisted learning in nursing training to acquire clinical skills in Ugandan universities is still very limited. Understanding the student's perceived, ease and usefulness of training videos may promote their use in teaching nursing skills at different training levels.

### **Significance**

Understanding students' perceptions may inform educators on how to design and implement effective video-based learning strategies that resonate with the students' preferences and learning styles

Findings from the study may guide curriculum developers in integrating technology and video-based learning effectively into nursing education programs, ensuring alignment with students' needs and expectations. Insights into students' perceptions can inform

educators about the most effective pedagogical approaches, fostering engagement and understanding of clinical skills through video-based learning.

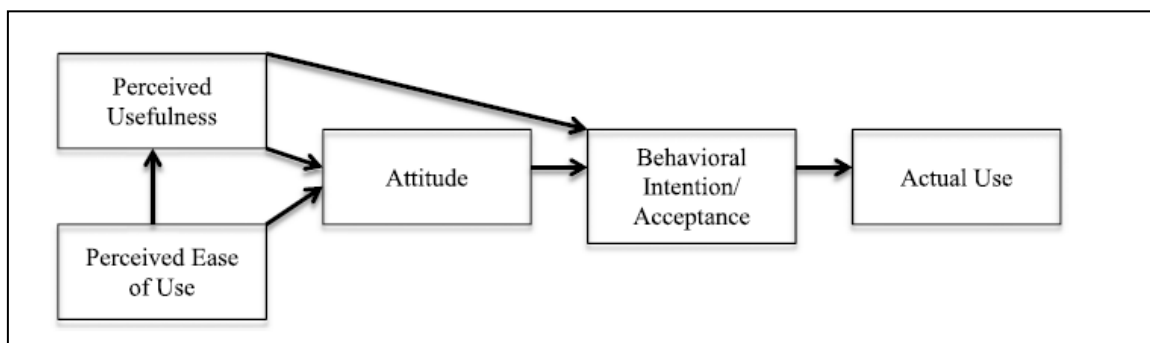
Policymakers in education and healthcare could use the study's results to make informed decisions on resource allocation, supporting the integration of technology into nursing education where it is most beneficial. The study may also contribute to the development of guidelines and policies for the use of instructional videos in nursing education, ensuring a standardized and effective approach.

The study will add to the body of knowledge regarding the integration of technology in nursing education in faith-based institutions in Central Uganda thus closing the research gap in this specific context. It may also identify areas for future research in this area of study.

## Theoretical Framework

### Davis' Technology Acceptance Model (TAM)

Davis' technology acceptance model will be used in this study. The model suggests that the perceived usefulness and perceived ease dictate how the mind of the user responds to and easily adjusts towards using the technology. Relatedly, it further suggests that 'Perceived Usefulness' tends to impact the behavioural intention of the use of technology. It is the mindset that determines the behaviour of the user which ultimately influences the actual acceptance. Below is a diagrammatic representation of the model as was suggested by Davis in 1989.



### Figure 1: Davis' Technology Acceptance Model 1989

**Perceived usefulness:** This is defined as the degree to which a person believes that the use of a system will improve his performance while **Perceived ease of use** refers to the degree to which a person believes that the use of a system will be effortless (Davis, 1989).

**Attitude towards using:** This is defined as the user's assessment of the desirability of using a specific information system application (Farzaneh & Nejadansari, 2014). Attitudes are shaped by perceptions of the technology's usefulness (i.e. whether the technology will increase job performance and productivity) and ease of use (the extent to which the technology is effortless (Davis, 1989).

**Behavioural intentions to use:** These refer to the motivational factors that influence a given behaviour where the stronger the intention to perform the behaviour, the more likely it will be performed (Davis, 1989; Fathema & Sutton, 2013).

**Actual system use:** This is the degree to which a person accepts and utilizes the generated system fully (Turner et al., 2010).

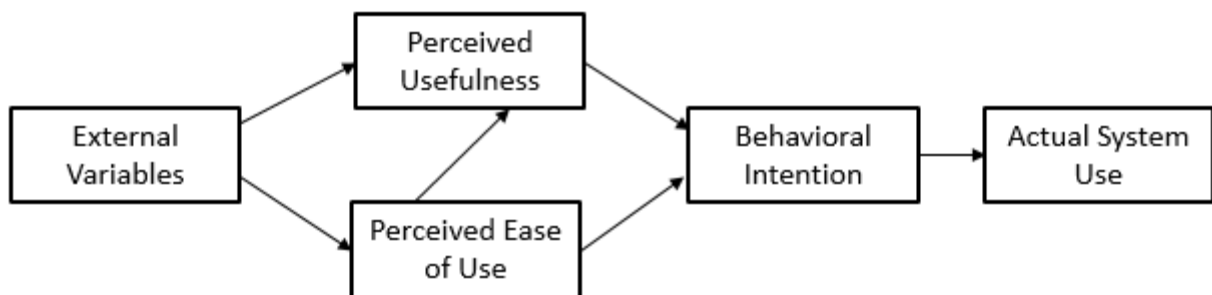


Figure 2: Application of TAM in this study; Source: Davis & Venkatesh, 1996

External variables in the TAMs model are aspects that are not necessarily part of the experiment but rather put/exert some stimulus on the dependent variable basically under study (Jones et al., 1977). This study will be exploring students' perception; Perceived Ease of Use (PEOU), and Perceived Usefulness (PU) and their intention to use training videos to

learn clinical skills. Notably to consider are the external variables that will influence the student's perceptions, attitudes, behavioural intentions to use and actual usage, and this is where TAM is an ideal model to use in this study. **External variables:** Prior exposure to training videos, mode of delivery, the technology used, perceived benefits of the use of training videos, learner performance, learner-learner interaction, learner-teacher interaction, infrastructural-related factors (connectivity, digital access, audio quality, video quality, and duration/length of the video) and ICT skills set will be assessed. **Study subjects:** The students under study will be undergraduate direct nursing students from advanced level at second year of their study at the university.

## **Chapter two: literature review**

### **Introduction**

This chapter reviews studies on the use of training videos to learn clinical skills, particularly for nursing students. The researcher seeks to build an understanding of the perceptions and practices of students on the use of training videos to learn clinical skills.

## **Review of the literature in relation to the study objectives**

### **Technology in the History of Nursing Education**

Nursing education, defined as the means by which students are recruited, oriented and guided to successfully master the science and art of nursing in accredited nursing educational institutions (Nxumalo, 2011) requires a combination of theoretical and nursing skills, as well as learning experiences that enable nursing students to acquire the knowledge, skills, and attitudes necessary to deliver nursing services (Henderson, Cooke, Creedy, & Walker, 2012).

It traces its history and roots from the Doctor of Philosophy Mildred Montag, who was known for her influence on nursing education. Her goal was to provide a workforce to support the professional nursing she envisioned. This required a radical change in how nurses were trained and prepared for clinical nursing practice (Harker, 2017). Traditional methods of nursing training were mainly teacher centered. Nursing skills were taught in theory, followed by a demonstration by the instructor, and later the student would do a counter-demonstration to perfect the skill. However, with the advancement of technology, newer learning methods such as the use of the Internet and multimedia, have been adopted to teach complicated clinical skills (Sowan & Idhail, 2014).

Clinical skills are the essential nursing skills required to provide excellent, safe and cost-effective nursing care, which are acquired through clinical nursing education (DeWit & Williams, 2013). The invention of technology has been seen as an essential aspect that can improve the acquisition of nursing knowledge. It is imperative for all nursing students to become familiar with technology, skills, and knowledge that act as a catalyst for critical thinking and making sophisticated decisions during their practice (Öztürk & Dinç, 2014). This has prompted nurse educators to incorporate innovative methods that ultimately enhance learner skill acquisition and knowledge enhancement.

## **Perception as A Key Element in Learning**

Perception is the ability of noticing, or apprehending by use of the senses, mind, cognition or understanding. It can also be defined as the result or product of perceiving, as distinguished from the act of perceiving (Ingold, 2002).

A dominant element of learning is how students perceive themselves and the subject or learning processes to be learned. This item is called the learner's self-concept and relates to whether a student is insecure or confident about the subject, which has a major impact on the perception process. Perception in learning leads to a willingness to pursue knowledge, typically in a way that is self-directed and independent of the environment (L. S. Joon, Sandhya, Trudian, David, & Samantha, 2011). In these investigations, perceived ease of use and perceived usefulness have a direct impact on whether or not the student will use training videos to learn nursing skills.

Studies focusing on the relationship between students' perceptions of the learning environment and their approaches to learning have shown that students may perceive the same environment differently. Positive perceptions of the teacher-learner environment are associated with a deep approach to learning, while more negative perceptions are associated with a superficial approach (Kreber, 2003; Lawless & Richardson, 2002; Parpala, Lindblom-Ylänne, Komulainen, Litmanen, & Hirsto, 2010; Sadlo & Richardson, 2003).

## **Use of Videos to Promote Knowledge and Skills Acquisition in Nursing Education**

Technological developments have enhanced knowledge acquisition through a variety of methods, including the use of training videos (Moro, Stromberga, & Birt, 2020). Many studies agree that clinical skills training videos are an effective approach to teaching clinical skills, allowing the learner to combine theory and practice and increasing learning autonomy for the adult learner (Coyne et al., 2018). The skills lab and the demonstration methods earlier used would only manage a maximum of 20-25 students (Vidergor, Sela, Vidergor, & Sela,

2017). With the increase in student numbers in care institutions, students may not learn skills well with demonstrations. This is also because demonstrations are delivered in real time and the learner can only watch the demonstration once.

Health care across the globe has rapidly changed from a task oriented to a knowledge-focused model. One of the methods of instruction that continues to hold great promise for educators is the use of video-taped simulation. Here in video simulation is defined as using interactive videos to mimic the reality of a clinical environment or situation. Educational instruction using video simulation has been shown to be effective in transferring knowledge and significantly improving learning outcomes in nursing students and others (L. Joon, Russell, & Peter, 2007; Sharpnack, Goliat, Baker, Rogers, & Shockey, 2013). In their project findings support the use of videos for the application of theoretical knowledge to clinical situations, promotion of critical thinking skills and development of quality, safety and leadership competencies.

### **Perceived Usefulness Enhances the Use of Training Videos**

Perceived usefulness is defined as the degree to which a person believes that the use of a system will improve his performance and it is viewed as a key determinant for intention to use any technological system (Davis, 1989).

Alharbi and Drew (2014) conducted a study on using the technology acceptance model to understand academics' behavioural intention to use learning management systems. The results showed that respondents found the perceived usefulness, attitudes and behavioural intentions towards using e-learning to be positive. Christopher et al. (2018) conducted a study to examine perceptions of the usefulness and intentions of genetic counsellors to use refined risk models in clinical care based on the Technology Acceptance Model (TAM). Results showed that perceived usefulness and perceived ease of use were both indirectly related to intentions about use preferences. Most were very impressed, enjoyed the

experience and saw great potential for its use in the future, concluding that while virtual reality was viewed positively, changes are needed to ensure optimal user experience and potential benefit. In Uganda, Milly, Xun, Meena, and Cobbinah (2021) measured the adoption of mobile banking systems by analyzing the perceived ease of usefulness, perceived ease of use and perceived risk on actual usage. Results showed a good and acceptable fit to the TAM Model.

### **Perceived Ease Promotes the Use of Technology**

Perceived ease of use refers to the degree to which a person believes that using a system will be effortless (Larcker & Lessig, 1980). A system will be adopted by an individual if it is perceived as easy to use (Wilson, Keni, & Tan, 2021). A study to determine the perceived ease of use and perceived usefulness of an online toolbox for employers in enhancing the successful return to work of cancer survivors, aimed at gaining insight into the perceived use and benefits of the online toolbox by employers was conducted. The results showed that employers found the intervention useful and practical. They appreciated the fact that the intervention was web-based and combined visual and textual content. Researchers concluded that the perceived usefulness and perceived ease of use of the online toolbox provided employers with a useful tool in their daily practice and thus adopted it (Greidanus et al., 2020).

Audiovisual virtual reality experiences can be analysed and evaluated using the Technology Acceptance Model (TAM), a theoretical framework that assesses the acceptance and adoption of technology by individuals by examining users' attitudes, intentions, and behaviours towards this technology (Davis, 1989).

## **Training Videos Enhance Students' Clinical Skills**

A study reveals that there has been a drastic shift to the utilization of videos and other online technologies to teach skills in nursing education. This has increased students' performance, especially in clinical skills, and competence during hospital placements, after employment and during teaching (Hansen, 2011). Likewise, studies have found that training videos helped nursing students prepare for skills practice and this improved the usage of training videos and student perception towards its usage.

There has been an increase in the utilization of Internet and multimedia services in learning of complicated clinical skills and it is greatly attributed to the intensive and blended curricular adoption. Videos contribute to quality nursing as they allow learners to develop clinical skills in a real-life situation, facilitating correct performance and knowledge acquisition without the added anxiety that comes with practising nursing skills in real-life situations (Forbes et al., 2016).

## **Davis' Technology Acceptance Model Influences Behavioural Intention to Use Technology**

A TAM-based approach was used to examine the factors that lead to students' behavioural intention to use a video-based learning system. The focus was on identifying external constructs that can improve the predictive capability of TAM, instead of considering the adoption scenario in an actual usage environment (Lee, Srinivasan, Trail, Lewis, & Lopez, 2011). In an experimental test bed for computer engineering students, to examine the process of adoption of an online learning environment, a TAM-based approach was used and its effectiveness for conducting virtual laboratory sessions was reported (Estriegana, Medina-Merodio, & Barchino, 2019).

In a study to determine factors and predictors that influence nurses' intention to use the electronic Intensive Care Unit (eICU) technology, the applicability of the Technology Acceptance Model in explaining nurses' intention to use the eICU technology in healthcare settings was examined. 117 participants from two healthcare systems were included. Findings revealed that perceived usefulness is the most influential factor that influences nurses' intention to use the eICU technology. The principal factors that influence perceived usefulness are perceived ease of use, support from physicians, and years working in the hospital (Kowitlawakul, 2008).

In a study aimed at investigating user acceptance of technology in an informal environment, distributed tablets to university students studying EFL. The participants completed a survey based on the TAM adapted version of questionnaire. The results showed that students believed tablets as to be easy to use, effective and that they were satisfied with the device for informal language study (Jang & Chen, 2013).

Moreover, in as much as studies agree that perceived usefulness and perceived ease of use have an effect on actual usage of the training videos, most of these studies have not been

done in Uganda and among those done in Uganda, there is no documented evidence about perception and intent of students on use of training videos to learn clinical skills mainly in the central region (Mayoka & Kyeyune, 2012). Therefore, this study seeks to determine the perception and intent of second year direct undergraduate nursing students to use of training videos to learn clinical skills before and after a training session in one of the Faith-based universities in Uganda.

## **Summary**

The literature review examines the use of training videos in learning clinical skills, particularly for nursing students, and highlights the historical evolution of nursing education, the significance of perception in learning, and the effectiveness of videos in promoting knowledge and skills acquisition. Studies indicate that videos enhance learning autonomy, improve knowledge transfer, and facilitate skill development in nursing students. Perceived usefulness and ease of use are key determinants of students' intention to use training videos, as evidenced by various studies using the Technology Acceptance Model (TAM). However, despite the extensive research in this area, there is a notable research gap in understanding the perceptions and intentions of nursing students regarding the use of training videos for learning clinical skills in Uganda, particularly in faith-based universities. This study aims to address this gap by investigating the perceptions and intent of second year direct undergraduate nursing students in Uganda, providing valuable insights into the effectiveness and acceptance of training videos in nursing education.

### **Chapter three: Methodology**

Chapter three addresses the methodology which was used in the study to assess the perceptions and intent of second year direct undergraduate nursing students to use videos for learning clinical skills, before and after a teaching session using training videos. It presents the research approach, research design, study population, sampling, area of study, methods of data collection, data collection instruments, quality control, data management and analysis, and ethical considerations.

#### **Research Design**

The study employed a quantitative research approach, utilising a one group pretest-posttest design. The quantitative research approach, as outlined by Creswell and Plano-Clark (2007), is a systematic method used to collect, analyze, and interpret numerical data to understand phenomena in the social sciences, psychology, economics, and various other fields. Quantitative research relies on objective measurements and numerical data. This means that researchers aim to quantify variables to analyze relationships, patterns, and trends.

The study employs a one group pretest-posttest design. This is a quasi-experimental study design in which the same dependent variable (ease and usefulness) is measured in one group of participants before (pretest) and after (posttest) treatment is administered (Stratton, 2019). Quasi-experimental studies are studies that evaluate the intervention without randomizing patients to any study arm (Harris et al., 2006). The selection of this study design is informed by research conducted by Stratton (2019), which demonstrates that a pre- and post-study design is most effective in evaluating participants' attitudes or perceptions in relation to the introduction of a new concept/tool. This design is also suitable where obtaining a large sample size is challenging.

## **Study setting**

The study was conducted at Islamic University in Uganda (IUIU) among Second Year Direct Undergraduate students. IUIU is a multi-campus university offering courses at certificate, diploma, undergraduate and postgraduate levels and was opened in the year 1988 by the Organization of Islamic Cooperation (OIC) under a bilateral agreement between the Government of Uganda (GOU) and the OIC (John Tugume, 2021).

It has four major campuses i.e. the main campus located in Mbale and is about 222km from Uganda's capital, Kampala campus which is located on the Kibuli Hill and is 3.5km south-east of Uganda's capital, female campus (Kabojja campus) which is 8km west of Uganda's capital and Arua campus which is in the town of Arua, and is approximately 400km north-west of Uganda's capital city.

The study took place at the Kampala campus, faculty of health sciences, department of nursing. IUIU Kampala branch was purposively selected to serve as the study setting because of its feasibility and accessibility but also because it's the only IUIU branch that offers a degree in nursing.

## **Target Population**

All 33 direct second year undergraduate nursing students enrolled at IUIU. The reason as why this population was chosen is because it is during the second year of study that students are introduced to hospital practicals.

## Sample Size Determination

The sample size was based on Yamane formula 1970

$$n = N \frac{N}{1+N(e)^2}$$

Where,

- n is the total required sample size
- N is the population size
- e is the margin of error

$$n = 33 \frac{33}{1+33(0.05)^2} = 30$$

Sample size becomes 30 students from the selected study site.

## Sampling strategy

Simple random sampling was employed to select participants who meet the eligibility criteria for the quantitative data. This type of sampling was used because it is an efficient the probability sampling method at controlling sampling bias (Thewes et al., 2018).

A complete list of potential participants (the population) was compiled, and each individual was assigned a unique number. A table of random numbers was then used to select participants. To ensure randomness, a starting point on the table was chosen by placing a finger on the table without looking. From that starting point, random numbers were read directly from the table, and individuals corresponding to those random numbers were selected for participation. This process ensured that every individual had an equal and independent chance of being selected.

## **Eligibility Criteria**

### **Inclusion Criteria**

All second year direct undergraduate nursing students who;

- Have registered for studies at IUIU
- Be 18 years of age and above
- Have attended the basic nursing skills course unit

### **Exclusion Criteria**

All second year direct undergraduate nursing students who were;

- Students with visual or hearing impairment
- Be critically ill to participate in the study

## **Data Collection**

### **Data Collection Method**

Primary data was collected for this study using a questionnaire to gauge participants' perceptions before and after exposure to a video showing how the urinary catheter is being inserted.

### **Questionnaires**

Kothari (2013) defined a questionnaire as a form of interrelated questions that are prepared by the researcher about the research problem under study based on objectives. It is a method of gathering data from a large size of respondents (Amin, 2005). This method were utilized to obtain information from the students. Questionnaires were applied because they allow for the generation of quick responses from many participants within a short time. They can also measure the attitudes, feelings, interests and opinions of the respondents (Amin, 2005).

## Data collection Instrument

### Survey questionnaire.

The data collection tool for assessing the traditional method of learning comprised ten Likert-scale questions. These questions were meticulously designed to measure participants' perceptions regarding various aspects of traditional teaching, and these include:

**Table 1:** *Questionnaire Designing*

Section	Question
<b>Demographic Information</b>	Age, Gender, Reported Disabilities (Hearing/Visual Impairments)
<b>Traditional Method</b>	1. Effectiveness in Conveying Course Content
	2. Aid in Understanding Course Material
	3. Engagement in In-Person Discussions
	4. Facilitation of Practical Application
	5. Helpfulness in Evaluating Understanding
	6. Motivation for Active Participation
	7. Accommodation of Diverse Learning Styles
	8. Relevance and Up-to-Datedness of Course Material
	9. Facilitation of Understanding the Skill
	10. Clarity of Explanations
<b>Video-Based Teaching</b>	1. Effectiveness in Conveying Course Content
	2. Aid in Understanding Course Material
	3. Engagement in Video-Based Discussions
	4. Facilitation of Practical Application
	5. Helpfulness in Evaluating Understanding
	6. Motivation for Active Participation
	7. Accommodation of Diverse Learning Styles
	8. Relevance and Up-to-Datedness of Video Content
	9. Facilitation of Understanding the Skill
	10. Clarity of Video Explanations
<b>Intent to Use Videos for Further Learning</b>	1. Intent to Utilize Videos as Supplementary Learning Tools
	2. Perceived Enhancement of Understanding through Videos
	3. Motivation to Integrate Video Learning
	4. Confidence in Effective Use of Video Resources
	5. Alignment of Video Learning with Preferred Style
	6. Belief in Video-Based Learning's Impact on Retention

## **Checklist**

A checklist was created to assess nurses' skill levels in performing female catheterization both prior to and following the implementation of a pre-operative teaching checklist. The purpose of this tool was to evaluate the impact of a video-based training intervention on enhancing clinical competencies.

## **Dissemination of the Training Video & Survey Tools**

The researcher independently created the training videos and, after shared a URL link with the students. The videos were provided in MP4 format, enabling students to rewatch them at their convenience and pace. These nursing skill training videos served as a mobile support tool, allowing unlimited viewing and practice simulations alongside the videos. Additionally, students had unrestricted access to download and retain the videos permanently on their mobile devices or laptops/computers.

## **Data Quality Control**

For validity and reliability (In, 2017), the data collection tool was piloted on 05 students before the conduct of the study. This aided in the establishment of any edits that were needed as well as setting clear rules on how missing data will be handled and any conflicting variables. The research assistant (RA) a student of health work was trained on communication skills, participant recruitment criteria, questionnaire administration, and research ethics before the commencement of the research.

The questionnaires was verified by the RA for completeness before returning them to the Principal Investigator. Regular fortnight meetings were held between the PI and the RA to share experiences, challenges, performance, and progress on data collection. Regular meetings with the statistician was also conducted. Confidentiality was observed by assigning identification numbers. The questionnaires was also double entered by trained data entrants, and any discrepancies identified was resolved before a final dataset was created.

## **Data Management and Analysis**

All raw data was backed up at all data entry and analysis stages on password-protected laptops and an external drive. Data was treated with confidentiality of the highest order as no participant names were used, instead IDs were assigned.

## **Quantitative data Analysis**

Upon completion of data collection and data preparation, the project proceeded with a rigorous data analysis phase to gather insights from the collected information. Statistical Package for Social Sciences (SPSS) version 22 for Windows were employed to perform the statistical analysis, ensuring precision and robust results. Before analysis, data was meticulously reviewed and cleaned to eliminate any inconsistencies or errors.

Description of participant characteristics at baseline: This applied for only demographic characteristics. Continuous variables were summarized as the mean and standard deviation or as median and interquartile range depending on the distribution and categorical variables were summarized as frequencies and percentages.

Effectiveness of video-based teaching: A paired t-test was performed to determine if there exists a statistically significant difference in perceived ease before and after the video-based teaching session, as well as to assess the perceived usefulness and willingness to use videos for learning. Levene's test for equality of variance was administered to ascertain whether the assumption of equal variances between the two groups (pre-video and post-video) holds, thus informing the choice of the appropriate statistical test.

Descriptive analysis was employed to ascertain the frequencies, overall mean scores, and standard deviations for both the pre and post-Video Surveys, as well as the Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) scales. Additionally, the analysis

encompassed the utilization of video-based learning, which was evaluated using the Content-Mapping and Conceptual Reconstruction (CMCR) tool (Harrison, 2015).

### **Ethical Considerations**

The ethical framework for this research study encompasses several key elements to safeguard the rights and well-being of the participants. Approval to conduct the study was sought from both the UCU (Uganda Christian University) research ethics committee and the ethics committee of IUIU (Islamic University in Uganda). Ethical approval ensures that the study adheres to established ethical standards and guidelines.

Participants were provided with written information detailing the study's purpose and objectives. They were requested to sign a consent form, which was appended to the survey questionnaires. The informed consent form, included in the appendices, explicitly outlined the study's purpose, benefits, and the assurance that participation never caused harm. Additionally, it affirmed the rights of the respondents in the research process, including the freedom to withdraw from the study at any point without consequences.

Each participant had the opportunity to thoroughly review and seek clarification on the contents of the consent form. Contact information for the researcher, study supervisor, and the Institutional Review Board (IRB) or Research Ethics Committee (REC) at their respective universities were provided on the form. This ensured that participants have access to any additional information or support they may require.

To guarantee the anonymity and confidentiality of participants, no identifying data were collected on the survey questionnaires. Instead, a coding system was used. Survey questionnaires, once completed, were securely stored and locked in the researcher's office, providing an additional layer of protection for participant data. Participation in the study was entirely voluntary, and no one was coerced into participating against their will. These

comprehensive ethical considerations were designed to uphold the principles of autonomy, informed consent, and privacy, ensuring the ethical conduct of the research study.

The investigation into the perception and intent of second-year direct undergraduate nursing students regarding the use of videos to learn clinical skills leveraged a robust one-group before-and-after (quasi-experimental) design. This deliberate design choice imbued the study with several intrinsic strengths that fortified the depth and reliability of its findings. Central to this design's strength was its capability to conduct a direct before-and-after comparison within the same cohort of participants. By assessing the perceived ease and usefulness of training videos both before and after a teaching session, the study allowed for an immediate examination of shifts in perceptions within the group itself. This real-time comparison yielded valuable insights into the direct impact of the teaching intervention on participants' perceptions, offering a nuanced understanding of the changes that occurred within the same group.

Moreover, the quasi-experimental design empowered the study to explore causality more effectively compared to alternative study designs. By observing changes in perception within the same group before and after exposure to the teaching session, the study could more accurately infer the influence or causative effect of the intervention (use of training videos) on participants' perceived ease and usefulness in performing urinary catheterization. The study's immediate assessment of changes in perception held substantial practical implications. It allowed for prompt adaptations or enhancements in teaching methodologies based on real-time feedback. This practical applicability was particularly pertinent in educational settings, enabling educators to tailor and refine teaching strategies swiftly and effectively based on students' responses and educational needs.

Furthermore, the chosen one-group before-and-after design mitigated confounding variables that may have arisen from differences between distinct groups, enhancing the

study's internal validity. By focusing on changes within the same group of participants, it effectively controlled individual differences, strengthening the reliability of conclusions drawn from the observed alterations in perception. This methodological approach, aligned with the context of educational interventions, provided an opportunity for an in-depth exploration of the immediate impact of integrating training videos into nursing education. Its feasibility and alignment with the educational setting positioned it as a pragmatic approach for assessing the perceived effectiveness of teaching methodologies.

### **Study Limitations**

**Small Sample Size:** The study involved a limited number of second year direct undergraduate nursing students from a single private faith-based university, which may limit the generalizability of the findings to other nursing programs or institutions across Uganda or beyond.

**Short Duration of Exposure:** The teaching session and video-based learning intervention were conducted over a relatively short period. A longer follow-up might provide more insight into long-term perceptions and intent to use videos.

**Self-Reported Data:** The study relied on self-reported questionnaires, which may be subject to response bias, including social desirability bias or inaccuracies in recall.

**Single Clinical Skill Focus:** The study focused specifically on urinary catheterization. Therefore, the findings may not fully represent students' perceptions and intentions regarding the use of videos for learning other clinical skills.

**Technological Access and Literacy:** The study did not account for variations in students' access to devices or internet connectivity, or their prior exposure to video-based learning, which could have affected their experiences and responses.

## Chapter Four: Research findings

This chapter presents the findings of the study, organized according to the specific objectives. It begins with the demographic profile of respondents, covering variables such as gender, age, and disability status. The chapter then examines the perceived ease and usefulness of training videos among nursing students both before and after a teaching session, highlighting changes in their attitudes and perceptions post-intervention. Additionally, it explores students' intent to use videos for learning clinical nursing skills, assessing shifts in motivation and confidence. Finally, the chapter evaluates skill levels in performing female catheterization before and after the intervention, including the impact of a pre-intervention teaching checklist, with statistical analyses showcasing improvements in competency and proficiency post-intervention.

### Demographic Results

This section presents the demographic information of the respondents involved in the study investigating the perceptions and intent of second year direct undergraduate nursing students to use videos to learn clinical skills. The demographic variables include gender of respondents, disability, and age.

**Table 2:** *Result on Demographic Information*

	Frequency	Percent			
<b>Gender of participant</b>					
Female	8	26.7			
Male	22	73.3			
<b>Total</b>	<b>30</b>	<b>100</b>			
<b>Report Disabilities</b>					
Visual Impairment	1	3.3			
None	29	96.7			
<b>Total</b>	<b>30</b>	<b>100</b>			
			<b>Std.</b>		
	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Deviation</b>
Age of participant	30	19	40	23.167	4.587

Out of the 30 participants in the study, the majority were male 22 (73.3%), while females made up 8(26.7%) of the participants. This suggests a gender imbalance, with significantly more males than females participating in the study. This imbalance could

potentially influence the study's findings if gender is a relevant factor in the outcomes being measured.

Most participants 29 (96.7%) reported having no disabilities, with only one participant 1 (3.3%) reporting a visual impairment. This indicates that nearly all participants are likely able to fully engage with the study materials and activities without any disability-related limitations. The single participant with a visual impairment represents a small minority and is unlikely to significantly affect the overall study results.

The ages of participants ranged was 23 years on average. The standard deviation of 4.587 years indicates a moderate spread in the ages of the participants around the mean. Most participants are likely to be young adults, with some variation in age but generally clustered around the early 20s. This age distribution is typical for studies involving younger adults. This possibly reflects the demographics of a student or early-career population.

**The perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization before a teaching session on training videos.**

This section provides findings on the perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization before a teaching session on training videos

**Table 3:** Perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization before a teaching session on training videos.

	<b>STRONGLY DISAGREE</b>		<b>DISAGREE</b>		<b>NEUTRAL</b>		<b>AGREE</b>		<b>STRONGLY AGREE</b>	
	<b>Count</b>	<b>Row N %</b>	<b>Count</b>	<b>Row N %</b>	<b>Count</b>	<b>Row N %</b>	<b>Count</b>	<b>Row N %</b>	<b>Count</b>	<b>Row N %</b>
Video-based learning is very effective in explaining complex practical skill urinary catheterization content.	1	3.3%	3	10.0%	7	23.3%	11	36.7%	8	26.7%
If it is very easy to use videos to learn urinary catheterization.	0	0.0%	4	13.3%	7	23.3%	17	56.7%	2	6.7%
Videos based methods of learning are NOT engaging and interacting at all learning process.	0	0.0%	5	16.7%	9	30.0%	12	40.0%	4	13.3%
Video-based training facilitates practical application or hands-on learning catheterization	3	10.0%	10	33.3%	9	30.0%	3	10.0%	5	16.7%
Using videos does not require a lot of my physical and mental effort	4	13.3%	8	26.7%	8	26.7%	8	26.7%	2	6.7%
Video-based learning materials motivates active participation in the practical skills on urinary catheterization.	4	13.8%	8	27.6%	9	31.0%	5	17.2%	3	10.3%
Video-based training does NOT accomodate diverse learning styles.	3	10.0%	6	20.0%	6	20.0%	11	36.7%	4	13.3%
Material delivered through video-based training is NOT relevant and up to date to promote practical skills on urinary catheterization.	4	13.3%	7	23.3%	7	23.3%	9	30.0%	3	10.0%
Explanations provided in video-based training methods are very easily understood.	0	0.0%	2	6.7%	11	36.7%	9	30.0%	8	26.7%

It is believed that doing this activity is useful for improved concentration.	1	3.3%	3	10.0%	8	26.7%	11	36.7%	7	23.3%
It is thought that this activity is important for my improvement.	0	0.0%	3	10.0%	9	30.0%	11	36.7%	7	23.3%
It is thought that this was a very boring way of teaching catheterization.	5	16.7%	11	36.7%	9	30.0%	3	10.0%	2	6.7%
I am willing to do this activity again because I think it is somewhat useful.	0	0.0%	4	13.8%	8	27.6%	11	37.9%	6	20.7%

A majority of students 19 (63.4%) agree or strongly agree that video-based learning is effective for explaining the complex skill of urinary catheterization. A smaller portion 4 (13.3%) disagrees or strongly disagrees, while 7 (23.3%) are neutral. A significant majority 19 (63.4%) find it easy to use videos for learning urinary catheterization, while 4 (13.3%) disagree. About a quarter of the students 7 (23.3%) are neutral.

More than half of the students 16 (53.3%) agree or strongly agree that video-based methods are not engaging or interactive. However, 5 (16.7%) disagree, and 9 (30.0%) remain neutral. Opinions are diverse, with 13 (43.3%) disagreeing or strongly disagreeing that video-based training facilitates hands-on learning, while 8 (26.7%) agree or strongly agree. A significant portion 9 (30.0%) remains neutral. The responses are split, with 12 (40.0%) agreeing or strongly agreeing that videos do not require much effort, and 12 (40.0%) disagreeing or strongly disagreeing. This suggests mixed views on the ease of using videos. The majority of students 12 (41.4%) do not feel that video-based materials motivate active participation, with 9 (31.0%) remaining neutral. A smaller group 8 (27.5%) agrees or strongly agrees.

Half of the students 15 (50.0%) agree or strongly agree that video-based training does not accommodate diverse learning styles. However, 9 (30.0%) disagree or strongly disagree, indicating mixed perceptions. Opinions are mixed, with 12 (40.0%) agreeing or strongly agreeing that the materials are not up to date, 11 (36.6%) disagreeing or strongly disagreeing, and 7 (23.3%) neutral. A majority of students 17 (56.7%) agree or strongly agree that the explanations in video-based training are easily understood. Only 2 (6.7%) disagree, while 11 (36.7%) remain neutral. The majority of students 18 (60.0%) agree or strongly agree that video-based learning helps improve concentration, while 8 (26.7%) are neutral. Only 4 (13.3%) disagree. Most students 18 (60.0%) agree or strongly agree that video-based learning is important for their improvement, while 9 (30.0%) are neutral. Only 3 (10.0%) disagree. The majority 16 (53.4%) do not find video-based teaching boring, with 9 (30.0%) neutral and only 5 (16.7%) agreeing that it is boring. A majority of students 17 (58.6%) would be willing to engage in video-based learning again, recognizing its usefulness. About 8 (27.6%) are neutral, and only 4 (13.8%) disagree.

Most students demonstrate a generally positive view of video-based learning for urinary catheterization, with 63.4% finding it effective and easy to use. However, opinions on its engagement and interactivity are mixed, with 53.3% feeling that the methods are not

particularly engaging. There is also some disagreement about whether video-based training facilitates hands-on learning and whether it aligns with preferred learning styles, reflecting diverse perspectives on its practical application. While half of the students feel that video-based training does not accommodate diverse learning styles, most agree that the explanations are clear and that the videos improve concentration as seen in Appendix B. Despite mixed feelings on the effort required to use the videos and their ability to motivate active participation, a substantial majority would be willing to engage in video-based learning again, indicating recognition of its usefulness and a preference for its continued use.

**The perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization after a teaching session on training videos.**

The section below covers results on the evaluation of the perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization after a teaching session on training videos.

**Table 4:** *The perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization after a teaching session on training videos.*

	STRONGLY DISAGREE		DISAGREE		NEUTRAL		AGREE		STRONGLY AGREE	
	Count	Row N	Count	Row N	Count	Row N	Count	Row N	Count	Row N
		%		%		%		%		%
Video-based learning is very effective in explaining complex practical skill urinary catheterization content.	0	0.00%	5	16.70%	9	30.00%	10	33.30%	6	20.00%
If it is very easy to use videos to learn urinary catheterization.	0	0.00%	1	3.30%	11	36.70%	14	46.70%	4	13.30%
Videos based methods of learning are NOT engaging and interacting at all learning process.	1	3.30%	7	23.30%	8	26.70%	10	33.30%	4	13.30%
Video-based training facilitates practical application or hands-on learning catheterization	2	6.70%	10	33.30%	7	23.30%	9	30.00%	2	6.70%
Using videos does not require a lot of my physical and mental effort	2	6.70%	4	13.30%	8	26.70%	14	46.70%	2	6.70%
Video-based learning materials motivates active participation in the practical skills on urinary catheterization.	2	6.70%	4	13.30%	10	33.30%	10	33.30%	4	13.30%
Video-based training does NOT accommodate diverse learning styles.	1	3.40%	9	31.00%	13	44.80%	2	6.90%	4	13.80%
Material delivered through video-based training is NOT relevant and up to date to promote practical skills on urinary catheterization.	1	3.30%	5	16.70%	16	53.30%	8	26.70%	0	0.00%
Explanations provided in video-based training methods are very easily understood.	1	3.30%	0	0.00%	6	20.00%	12	40.00%	11	36.70%

It is believed that doing this activity is useful for improved concentration.	1	3.30%	1	3.30%	10	33.30%	11	36.70%	7	23.30%
It is thought that this activity is important for my improvement.	1	3.30%	0	0.00%	10	33.30%	12	40.00%	7	23.30%
It is thought that this was a very boring way of teaching catheterization.	4	13.30%	8	26.70%	12	40.00%	6	20.00%	0	0.00%
I am willing to do this activity again because I think it is some what useful.	1	3.40%	0	0.00%	12	41.40%	14	48.30%	2	6.90%

A majority of students, 16 (53.3%), agree or strongly agree that video-based learning is effective for explaining the complex skill of urinary catheterization. A smaller portion, 5 (16.7%), disagrees or strongly disagrees, while 9 (30.0%) are neutral. Most students, 18 (60.0%), agree or strongly agree that it is very easy to use videos to learn urinary catheterization. A small number, 1 (3.3%), disagrees or strongly disagrees, while 11 (36.7%) are neutral. A big percentage of students, 14 (46.7%), disagree or strongly disagree that video-based methods are not engaging and interactive during the learning process. A smaller portion, 8 (26.7%), agrees or strongly agrees, while 8 (26.7%) are neutral. A majority of students, 11 (36.7%), are neutral about whether video-based training facilitates practical application or hands-on learning of catheterization. A combined 12 (40.0%) agree or strongly agree, while 12 (40.0%) disagree or strongly disagree. A majority of students, 16 (53.3%), agree or strongly agree that using videos does not require a lot of physical and mental effort. A smaller portion, 6 (20.0%), disagrees or strongly disagrees, while 8 (26.7%) are neutral. A combined 14 (46.7%) of students agree or strongly agree that video-based learning materials motivate active participation in practical skills on urinary catheterization. A smaller portion, 6 (20.0%), disagrees or strongly disagrees, while 10 (33.3%) are neutral.

A majority of students, 17 (48.2%), are neutral about whether video-based training accommodates diverse learning styles. A combined 13 (45.2%) disagree or strongly disagree, while 6 (20.7%) agree or strongly agree. A majority of students, 24 (80.0%), agree or strongly agree that material delivered through video-based training is relevant and up-to-date for promoting practical skills in urinary catheterization. A smaller portion, 6 (20.0%), disagrees or strongly disagrees, while no students are neutral. A combined 23 (76.7%) of students agree or strongly agree that explanations provided in video-based training methods are easily understood. A smaller portion, 1 (3.3%), disagrees or strongly disagrees, while 6 (20.0%) are neutral. A combined 18 (60.0%) of students agree or strongly agree that the activity is useful for improved concentration. A smaller portion, 2 (6.6%), disagrees or strongly disagrees, while 10 (33.3%) are neutral.

Many students, 19 (63.3%), agree or strongly agree that the activity is important for their improvement. A smaller portion, 1 (3.3%), disagrees or strongly disagrees, while 10 (33.3%) are neutral. A smaller portion of students, 12 (40.0%), agree or strongly agree that the teaching method was very boring. A combined 12 (40.0%) disagree or strongly disagree, while 12 (20.0%) are neutral. A majority of students, 16 (55.2%), agree or strongly agree that they are willing to do the activity again because they think it is somewhat useful. A smaller portion, 1 (3.4%), disagrees or strongly disagrees, while 12 (41.4%) are neutral.

The pre- and post-intervention results reveal notable shifts in perceptions regarding video-based learning for urinary catheterization. Generally, as seen in Appendix A there was an increase in positive responses about the effectiveness and engagement of video-based learning, with a marked rise in agreement that videos are easy to use and facilitate practical application. For instance, the percentage of those agreeing that videos make learning easier rose from 56.7% to 46.7%, while those agreeing that video-based training facilitates hands-on learning increased from 10% to 30%. However, perceptions about the relevance and accommodation of diverse learning styles in video-based training improved, with a significant drop in those disagreeing with the statement about accommodating diverse styles.

This shift indicates that while some respondents initially felt video-based methods were less effective or engaging, the intervention improved overall perceptions of practicality, ease of use, and motivational aspects of video-based learning.

In conclusion, the assessment of video-based learning for urinary catheterization reveals generally positive attitudes among students. A majority find video-based learning effective for explaining complex skills and easy to use, with significant agreement that it facilitates learning and is relevant to practical skills see appendix C. Despite mixed opinions on engagement, practical application, and motivation, most students believe that the videos help with concentration and are valuable for their improvement. The shift from pre- to post-intervention responses indicates that perceptions of video-based learning improved significantly, particularly in its practicality and ease of use. While some concerns remain regarding its engagement and ability to accommodate diverse learning styles, the overall feedback suggests that the intervention successfully enhanced students' views on the utility and effectiveness of video-based learning, affirming its role as a beneficial educational tool.

**The intent of second year direct undergraduate nursing students to use video to earn clinical nursing skills after a training session.**

This section explores the intent of second year direct undergraduate nursing students to use videos for learning clinical nursing skills after a training session. The analysis compares student attitudes and perceptions before and after the intervention, assessing changes in their motivation, confidence, and belief in the effectiveness of video-based learning. By examining mean differences and statistical significance, the section evaluates whether the intervention influenced their intent to integrate video resources into clinical skill development.

**Table 5:** *Results on the Intent of students to use video to learn clinical skills*

	Pre- Intervention	Post- Intervention	Mean Difference	Levene's Test for Equality of Variances	
				F	sig.
I intend to use videos as a supplementary tool to learn clinical nursing skills after training sessions.	3.9667	3.7667	0.2	0.307	0.582
I believe videos can enhance my Integrating video-based learning into my clinical skill development after	4.1667	3.8667	0.3	0.043	0.837
I feel confident in my ability to Using videos for learning clinical nursing skills post-training aligns with	4.0333	3.6667	0.3667	2.296	0.135
I believe video-based learning could	3.6667	3.8	-0.1333	0.407	0.526
	3.5333	3.8	-0.2667	0.318	0.575
	3.9	3.5667	0.333	0.141	0.709

The intention to use videos as a supplementary tool did not significantly change (mean difference = 0.2) after the intervention, and the p-value (0.582) indicates that this change is not statistically significant. The Levene's test result (p = 0.582) suggests that the variances are equal between pre- and post-intervention groups.

Although there was a decrease in the belief that videos enhance understanding (mean difference = 0.3), this change is not statistically significant (p = 0.837). The Levene's test (p = 0.837) confirms

equal variances. Motivation to integrate video-based learning decreased (mean difference = 0.3667), but the change is not statistically significant ( $p = 0.135$ ). The Levene's test ( $p = 0.135$ ) indicates that the assumption of equal variances is not violated.

Confidence in using video resources slightly increased (mean difference = -0.1333), though this change is not statistically significant ( $p = 0.526$ ). The Levene's test result ( $p = 0.526$ ) supports equal variances. The alignment of video learning with preferred learning styles increased slightly (mean difference = -0.2667), but this change is not statistically significant ( $p = 0.575$ ). The Levene's test ( $p = 0.575$ ) indicates that variances are equal.

There was a slight increase in the belief that video-based learning improves retention (mean difference = 0.333), but this is not statistically significant ( $p = 0.709$ ). The Levene's test result ( $p = 0.709$ ) supports the assumption of equal variances.

The above results show that while there were some changes in attitudes and beliefs regarding video-based learning, none of the changes were statistically significant. This suggests that the intent and perceptions of second-year nursing students regarding the use of videos for learning clinical skills did not experience significant shifts following the intervention. Overall, while students may hold various opinions about video-based learning, the training did not markedly alter their intent or beliefs in a statistically significant way as seen in Appendix D and E.

Relating this to the study objective, which aims to assess the intention of nursing students to use video resources for learning clinical skills at post-training, it emerges from these results that there is a need for additional strategies or enhancements of the intervention. For instance, embedding interactive elements, follow-up measurements, or addressing individual learning styles might further reinforce the effects of video-based learning. The non-significant findings underscore the complexity of changing educational attitudes and the potential role of broader contextual factors-such as prior exposure to videos or the training environment-modulating such interventions. These can, therefore, be factored into the development and implementation of video-based learning tools in future nursing education.

### Skill Levels in Performing Female Catheterization Before and After the Intervention

This section analyses nursing students' skill levels in performing female catheterization before and after a video-based training intervention. The pre-intervention skills varied across categories, including "Competent," "Proficient," "Excellent," and "Needs Improvement."

**Table 6:** *Skill Levels in Performing Female Catheterization Before and After the Intervention*

Intervention		Frequency	Percent	Valid Percent	Cumulative Percent
Before	Valid	Competent	8	26.7	26.7
		Excellent	12	40.0	66.7
		Need Improve	4	13.3	80.0
		Proficient	6	20.0	100.0
		Total	30	100.0	100.0
After	Valid	Excellent	30	100.0	100.0

Before the intervention, the distribution of nursing skills in Performing Female Catheterization among second-year undergraduate students varied, with 40% of students rated as "Excellent" and 26.7% as "Competent." A smaller portion, 13.3%, needed improvement, and 20% were considered "Proficient." This indicates a range of skill levels in Performing Female Catheterization before the introduction of the video-based training, with a notable proportion already performing at a high level.

Following the intervention, which involved video-based training, all students (100%) were rated as "Excellent." in Performing Female Catheterization. This dramatic shift signifies a substantial improvement in skill levels after the training session, suggesting that the videos effectively enhanced the students' skills in Performing Female Catheterization.

Although the results indicate a remarkable improvement in the level of skill, with all students reaching an "Excellent" rating following the intervention, the attribution of this improvement to the video-based training alone cannot be established due to the absence of a control group. Since this study was without a control group to contrast these findings, it was not clear if the changes indeed occurred solely because of videos or were also biased from previous catheterization exposure, extra practice during the study period, or the so-called Hawthorne effect, which refers to a better performance just because subjects are part of a research study. Future studies with a control group and other interventions, such as traditional

lectures or peer mentoring, would better isolate the contribution of video-based training to enhanced skill and ensure a more robust evaluation of effectiveness.

### **Comparison of Nurses' Skill Levels in Performing Female Catheterization Before and After the Introduction of a Pre-Operative Teaching Checklist**

This section provides a comparative analysis of nursing students' skill levels in performing female catheterization before and after the introduction of a pre-operative teaching checklist. The aim is to evaluate the effectiveness of the video-based training intervention on improving clinical skills. By comparing the mean skill percentages, standard deviations, and statistical significance of the results, this analysis highlights the measurable improvement in students' proficiency post-intervention. The findings underscore the impact of video-based learning on enhancing nursing students' clinical competency.

**Table 7:** *Comparison of Nurses' Skill Levels in Performing Female Catheterization Before and After the Introduction of a Pre-Operative Teaching Checklist*

	<b>Mean (%)</b>	<b>SD</b>	<b>P-value</b>
Before Intervention	74.167	19.955	
After Intervention	95.000	5.902	
P-value (Equal variances assumed)			0.000

The mean percentage of skills increased from 74.167% before the intervention to 95.000% after the intervention, indicating a significant improvement in skills. The standard deviation decreased from 19.955 to 5.902, reflecting a reduction in variability and a more consistent high level of skill among students' post-intervention. The p-value of 0.000 (less than 0.05) confirms that this difference is statistically significant, reinforcing that the video-based training had a substantial positive impact on the students' ability to learn clinical nursing skills.

The results demonstrate that the video-based training was highly effective in improving the clinical nursing skills of second year direct undergraduate students. Before the intervention, there was a range of skill levels, but after the training, all students achieved an "Excellent" rating, with a statistically significant increase in mean skill levels. This supports the objective of assessing the intent and effectiveness of video-based learning for clinical skills, indicating that such training can significantly enhance nursing students' competency in their clinical practice.

## **Chapter Five: Summary and discussion**

This section presents the findings of the study in relation to the specific objectives, which were to assess the perceived ease and usefulness of training videos among second-year direct undergraduate nursing students in performing urinary catheterization before a teaching session on training videos; to evaluate the perceived ease and usefulness of training videos among the same group of students after the teaching session; and to determine their intent to use videos to learn clinical nursing skills following the session.

### **Summary of findings**

#### ***To Assess the Perceived Ease and Usefulness of Training Videos Before a Teaching Session***

##### **Effectiveness:**

The study assessed students' perceptions of the ease and usefulness of training videos before a teaching session on urinary catheterization. Results indicated that 63.4% viewed video-based learning as effective for explanations, though opinions were mixed regarding its engagement and practical application. While 63.4% found the videos easy to use, some felt they required considerable effort and questioned whether they motivated active participation. Engagement was low, with 53.3% considering the videos insufficiently interactive. Practical application was another concern, as 43.3% doubted the videos' facilitation of hands-on learning. Most students found the content relevant and clear, though some noted a lack of accommodation for diverse learning styles. Additionally, video-based learning was generally valued for aiding concentration and improvement, with many students willing to reuse the method despite occasional boredom due to its overall perceived usefulness.

#### ***To Evaluate the Perceived Ease and Usefulness of Training Videos After a Teaching Session***

##### **Effectiveness:**

Post-intervention findings on students' perceptions of training videos showed that 53.3% still viewed video-based learning as effective, though this represented a slight decline from pre-intervention levels. Ease of use was affirmed by 60.0% of students, marking a notable increase in agreement. Perceptions of engagement improved slightly, yet opinions remained mixed. The usefulness of video-based training for facilitating hands-on learning also saw improvement, although views were still divided. Students continued to find the material relevant and up-to-date, with enhanced clarity in explanations. Belief in the videos' usefulness for improvement and concentration persisted, despite some

continued views on boredom. Overall, a majority indicated a willingness to use video-based learning again, signaling a positive shift in perceptions.

### ***To Determine the Intent to Use Videos for Learning Clinical Nursing Skills After a Training Session***

Following a training session on using videos to support clinical nursing skills, students showed a stable intent to use videos as a learning tool, with only slight, non-significant changes in their perceptions of videos enhancing understanding, motivation, and retention. Confidence in using videos and alignment with individual learning styles also displayed minimal, non-significant shifts. Although beliefs in video-based learning's impact on retention saw a slight, non-significant increase, the most notable outcome was the improvement in students' clinical skills. Before the intervention, skill levels varied, with 40% rated as "Excellent" and others ranging from "Competent" to "Need Improvement." Post-intervention, all students reached an "Excellent" skill rating, indicating a significant enhancement in clinical competencies.

The results demonstrate that the video-based training was highly effective in improving the clinical nursing skills of second year direct undergraduate students. Before the intervention, there was a range of skill levels, but after the training, all students achieved an "Excellent" rating, with a statistically significant increase in mean skill levels. This supports the objective of assessing the intent and effectiveness of video-based learning for clinical skills, indicating that such training can significantly enhance nursing students' competency in their clinical practice.

### **Discussion of Findings:**

#### ***To Assess the Perceived Ease and Usefulness of Training Videos Before a Teaching Session***

##### ***Effectiveness:***

The study found that 63.4% of students viewed video-based learning as effective\*\* in explaining urinary catheterization. This supports findings by Coyne et al. (2018), who noted that clinical skills training videos offer an effective method for combining theory and practice in nursing education, particularly for complex skills. However, opinions on engagement and practical application were mixed. Some students felt the videos lacked engaging and interactive elements, which contrasts with the effectiveness noted in Sharpnack et al. (2013), where interactive videos in simulation were found to be valuable for promoting critical thinking and clinical decision-making.

With 63.4% of students finding videos easy to use, these results suggest an overall positive perception of the training videos' usability, which aligns with Greidanus et al. (2020), who found that employers appreciated web-based content for its simplicity and accessibility. Davis's (1989) Technology Acceptance Model (TAM) also emphasizes that perceived ease of use is a critical determinant of technology adoption, a view reflected in Wilson, Keni, and Tan's (2021) findings that ease of use promotes acceptance. However, despite this ease, students had mixed views on the effort required to remain actively engaged with the videos, highlighting a potential gap in motivational aspects that could make videos more compelling for repeated viewing.

A slight majority (53.3%) of students did not find video-based methods particularly engaging or interacting. This somewhat contradicts literature indicating that video-based learning can effectively engage students in clinical skill acquisition (Moro, Stromberga, & Birt, 2020). The lack of perceived interactivity in this study may be attributed to the limited opportunities for students to actively practice or receive immediate feedback from videos, unlike the interaction possible in skills labs or face-to-face demonstration methods, as noted by Vidergor et al. (2017).

Students' opinions were divided regarding the videos' effectiveness in facilitating hands-on learning, with 43.3% disagreeing that videos provided practical application. This division contrasts with traditional demonstration techniques, which facilitate immediate practice under supervision, as highlighted by Harker (2017). The limitations of videos in providing real-time, hands-on practice might explain why students viewed them as less practical, reflecting a need for blended learning strategies that combine video-based learning with hands-on practice.

The study found that most students considered the content relevant and explanations clear, which aligns with studies emphasizing the importance of clear and contextually relevant video content in clinical education (Alharbi & Drew, 2014). However, some students questioned whether the materials accommodated diverse learning styles, an area where video-based learning can sometimes fall short. Kreber's (2003) study also indicates that while technology can support learning, students' varied perceptions of the environment may require more adaptive materials to meet different learning needs.

A significant portion of students reported that video-based learning enhanced their concentration and skills improvement. This is consistent with previous research that found videos support focus by

allowing learners to review complex material at their own pace (Sharpnack et al., 2013). The Technology Acceptance Model (Davis, 1989) supports this view by suggesting that technologies perceived as useful and easy to use enhance engagement and learning outcomes.

Despite some students finding video-based learning monotonous, many expressed willingness to reuse the videos due to perceived usefulness. This paradox suggests that while students recognize the educational value, they may desire a more engaging or varied learning experience, as suggested by L. Joon et al. (2011), who found that positive perceptions of usefulness often override potential disengagement. Efforts to diversify content or integrate interactive elements could further enhance student willingness to reuse these resources.

### ***To Evaluate the Perceived Ease and Usefulness of Training Videos After a Teaching Session***

#### **Effectiveness:**

The slight decrease in perceived effectiveness post-intervention, with 53.3% of students affirming its effectiveness, aligns with mixed outcomes observed in previous research. Coyne et al. (2018) noted that while training videos effectively combine theory and practice, learner engagement can fluctuate based on individual student preferences. This minor decline might indicate that while videos are valued, students still perceive gaps, possibly due to limitations in video interactivity or the need for supplemental, hands-on practice. Henderson et al. (2012) emphasize that learning experiences must foster hands-on mastery, suggesting that students may benefit from a blended approach combining video with live demonstrations or simulations.

A notable increase in students finding the videos easy to use is consistent with the Technology Acceptance Model (TAM) as suggested by Davis (1989). Perceived ease of use, a critical factor in technology adoption, fosters positive attitudes toward the technology, making students more likely to continue using it for learning. Greidanus et al. (2020) also found ease of use essential in tool adoption, supporting that a user-friendly platform can enhance students' comfort and reduce learning barriers, potentially leading to better learning outcomes.

A slight improvement in perceptions of engagement suggests that videos are beneficial but could be further enhanced for higher engagement levels. Kreber (2003) and Richardson (2002) indicated that positive student perceptions of the learning environment lead to deeper learning approaches. However,

the mixed opinions here might point to a need for more interactive video content. Sharpnack et al. (2013) showed that interactive elements, such as simulated decision-making scenarios in videos, could increase engagement, suggesting a direction for enhancing video-based learning tools.

Students' increased perception of video training facilitating hands-on learning supports the views of Moro et al. (2020), who found videos effective in bridging theoretical and practical knowledge. Despite this improvement, the divided opinions suggest that videos alone may not fully satisfy students' needs for hands-on experiences. A blended model, incorporating both video training and in-person skill practice, could address this gap, aligning with Henderson et al. (2012) on the need for a holistic learning approach in nursing education.

The positive shift in students' perceptions of content relevance and clarity is aligned with Lawless and Richardson's (2002) findings that positive perceptions are associated with effective learning environments. This improvement reflects the importance of well-structured, up-to-date content in enhancing understanding. As Coyne et al. (2018) emphasized, effective training videos promote the application of theoretical knowledge to practical settings, a crucial aspect in nursing education.

The sustained belief in the usefulness of videos for skill improvement and concentration, despite mixed feelings about boredom, aligns with findings by Öztürk and Dinç (2014), who stressed that familiarization with technology supports critical thinking and concentration. This result suggests that while videos help students focus on skill improvement, the content or format might benefit from further adjustments to maintain engagement and mitigate repetitive fatigue.

The positive shift in students' willingness to reuse videos suggests increasing acceptance, consistent with Alharbi and Drew's (2014) findings that perceived usefulness and positive attitudes foster behavioral intentions toward continued use. Students' readiness to reuse the tool indicates an appreciation of its benefits, affirming videos as a valuable addition to traditional teaching methods.

### ***To Determine the Intent to Use Videos for Learning Clinical Nursing Skills After a Training Session***

The intention to use videos did not show a statistically significant change in post-intervention. While students recognized the potential benefits of video-based learning for understanding, motivation,

and retention, these beliefs only shifted slightly and were not strong enough to indicate a substantial increase in their intent to rely on videos as primary learning aids.

These findings are consistent with the Technology Acceptance Model (TAM), which posits that perceived usefulness and ease of use are key drivers of technology acceptance. Research by Davis (1989) and others suggests that, while students may acknowledge the benefits of videos for supplementary learning, a higher level of perceived utility may be required for students to adopt videos more integrally. This study aligns with findings from Moro, Stromberga, and Birt (2020), which indicate that video tools are valued for theoretical understanding but are often seen as less effective for practical, skill-based applications in nursing.

Students' confidence in using videos and the alignment of video learning with their preferred learning styles showed minimal and statistically non-significant change. This suggests that while students may feel comfortable with video-based tools, they do not necessarily view these tools as the most compatible with their learning preferences. Research emphasizes the impact of perceived ease of use and compatibility with learning styles on acceptance of educational technologies. Larcker and Lessig (1980) and Wilson et al. (2021) noted that comfort with using new tools and alignment with personal learning styles are critical to the adoption of new educational resources. However, in contexts where hands-on training is central, such as clinical skills, students may feel that videos are beneficial but insufficient as primary resources. These findings echo the research of Kowitlawakul (2008), which suggests that although students may find video-based learning accessible, they often prioritize learning tools that provide tactile, hands-on experience.

There was a slight increase in the belief that video-based learning improves knowledge retention, though this shift was not statistically significant. This minor change suggests that while students see some value in video tools for reinforcing knowledge, they may still consider other learning methods more effective for long-term retention. The role of video learning in knowledge retention is well-supported in literature. Studies by Sharpnack et al. (2013) and Vidergor et al. (2017) show that video tools can aid retention, especially when integrated with active learning strategies and real-world scenarios. This study's non-significant increase might reflect a preference for live demonstration or direct interaction, which students may perceive as more conducive to retaining clinical skills. Furthermore, the findings align with studies suggesting that while video learning can support retention,

it works best as a complement rather than a substitute for practical, hands-on training. Before the intervention, skill levels varied, with 40% of students rated as “Excellent” and others ranging from “Competent” to “Need Improvement.” Post-intervention, all students achieved an “Excellent” rating, indicating a marked improvement in skill proficiency.

The substantial improvement in skill levels underscores the effectiveness of practical, interactive training methods. According to Coyne et al. (2018), direct practice and feedback are essential for skill acquisition in nursing, and simulation-based training models (such as those integrating videos) have been shown to reinforce clinical competencies. However, the findings also suggest that while videos may provide a helpful foundation for theoretical knowledge, hands-on practice remains essential for achieving high skill proficiency. The contrast between video-based knowledge retention and the outcome of direct intervention is also supported by Sharpnack et al. (2013), emphasizing that videos, though beneficial, should ideally complement practical training to achieve optimal results.

## **Chapter six: Conclusion and Recommendations**

This section presents the conclusion and recommendations of the study in relation to the specific objectives, which were: to assess the perceived ease and usefulness of training videos among second-year direct undergraduate nursing students in performing urinary catheterization before a teaching session on training videos; to evaluate the perceived ease and usefulness of training videos among the same group of students after the teaching session; and to determine the intent of second-year direct undergraduate nursing students to use videos to learn clinical nursing skills following the training session.

### **Conclusions**

#### **Objective 1: Assess the Perceived Ease and Usefulness of Training Videos Before a Teaching Session**

The assessment of second-year nursing students' perceptions of training videos before the teaching session indicated that a majority recognized video-based learning as an effective tool for understanding urinary catheterization, with 63.4% affirming its ease of use. However, while students acknowledged the potential usefulness of videos, opinions were divided regarding engagement and practical application, suggesting that the current video resources may not fully meet the interactive and hands-on learning needs of diverse learners. This highlights the necessity for nursing programs to enhance video content with interactive elements to optimize student engagement and applicability in clinical practice.

#### **Objective 2: Evaluate the Perceived Ease and Usefulness of Training Videos After a Teaching Session**

Following the intervention, the evaluation revealed a slight decline in students' agreement on the effectiveness of video-based learning, although the perceived ease of use showed improvement, with 60% finding the videos easy to utilize. Despite these positive trends, student responses regarding engagement remained mixed, and practical application perceptions improved only marginally. This indicates that while the intervention may have increased familiarity and clarity of content, there is still a need for nursing programs to further develop video materials and incorporate interactive learning strategies to reinforce the perceived relevance and application of the training videos.

### **Objective 3: Determine the Intent to Use Videos for Learning Clinical Nursing Skills After a Training Session**

The intent to use videos as a supplementary tool for learning clinical nursing skills did not significantly change after the intervention, suggesting that while students recognized the benefits of video-based learning, their overall commitment to integrating these resources into their study habits remained stable. Additionally, confidence levels in utilizing videos and alignment with preferred learning styles showed minimal shifts, indicating a potential reluctance or lack of necessity perceived by students regarding video adoption. Therefore, nursing programs should focus on increasing the perceived value of video resources by demonstrating their effectiveness in enhancing understanding and retention through integrated, hands-on practice.

The comparison of skill levels before and after the intervention demonstrated a significant improvement, with all students achieving an "Excellent" rating post-training, which strongly supports the conclusion that video-based training, when effectively paired with practical application, significantly enhances nursing students' clinical competencies. This finding underscores the importance of incorporating video resources into nursing education as part of a blended learning approach to facilitate skill acquisition and boost overall educational outcomes.

### **Recommendations**

- i. Nursing programs should incorporate quizzes, real-time discussions, and practical demonstrations within video-based learning to enhance engagement. Educators and curriculum developers can collaborate to create interactive components, with faculty trained to facilitate discussions and design quizzes aligned with key video concepts.
- ii. Faculty and instructional designers should regularly update video content for clarity and relevance. Establishing a feedback mechanism and review schedule can help ensure video materials remain effective and meet students' evolving learning needs.

- iii. Programs should develop additional resources, such as case studies and peer discussion sessions, to complement video learning. Coordinators can design relevant case studies and facilitate peer discussions to reinforce clinical skills and deepen knowledge application.
- iv. Nursing programs should adopt a blended learning approach, combining videos with hands-on practice sessions. Administrators can create a curriculum sequence where video learning precedes practical training, with faculty training on integrating these modalities effectively.
- v. Further studies on motivational aspects of video learning are recommended to tailor content to diverse learning needs. Insights from this research can guide the development of engaging, retention-focused video content for nursing students.
- vi. Given its effectiveness, video learning should be formally integrated into nursing curricula as a foundational tool. Program leadership should collaborate to align video content with clinical skill objectives, establishing a unified approach to video-based instruction.
- vii. Nursing programs should implement pre- and post-training evaluations to monitor student progress with video-assisted learning. Standardized assessments can offer insights into skill development and guide curriculum improvements for optimal training outcomes.

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**Appendices**

APPENDIX 1: Informed consent form

**STATEMENT OF CONSENT**

..... Informed Consent Form

I have been informed about the nature of this study, including what will be done, any potential risks and benefits, and my rights as a participant. I understand that participation in this study is entirely voluntary and that I may withdraw at any time without facing any consequences.

I have been assured that the information I provide will be kept confidential, and my identity will not be revealed in any reports or publications resulting from this study.

I understand that by signing this consent form, I am not waiving any of my legal rights. Rather, I am simply acknowledging that I have been fully informed about the study and that I voluntarily agree to participate.

I will receive a copy of this consent form for my records. Name of research participant.....

Age0

- a. Not at all
- b. Slightly
- c. Moderately
- d. Mostly
- e. Completely

- 2. How engaging are in-person discussions and interactions in traditional method learning process?
  - a. Not Engaging at All

- b. Slightly Engaging
  - c. Moderately Engaging
  - d. Very Engaging
  - e. Extremely Engaging
3. How well do traditional teaching methods facilitate practical application or hands-on learning?
- a. Not Well at All
  - b. Slightly Well
  - c. Moderately Well
  - d. Very Well
  - e. Extremely Well
4. How helpful do you find traditional teaching method in evaluating your understanding of the practical skill on urinary catheterization?
- a. Not Helpful at All
  - b. Slightly Helpful
  - c. Moderately Helpful
  - d. Very Helpful
  - e. Extremely Helpful
5. How motivating are traditional teaching methods in encouraging your active participation in the practical skill on urinary catheterization?
- a. Not Motivating at All
  - b. Slightly Motivating
  - c. Moderately Motivating
  - d. Very Motivating
  - e. Extremely Motivating
6. How well does the traditional teaching method accommodate diverse learning styles?
- a. Not Well at All
  - b. Slightly Well

- c. Moderately Well
  - d. Very Well
  - e. Extremely Well
7. How relevant and up-to-date do you find the practical skill on urinary catheterization material delivered through traditional methods?
- a. Not Relevant at All
  - b. Slightly Relevant
  - c. Moderately Relevant
  - d. Very Relevant
  - e. Extremely Relevant
8. How effective is traditional mode of teaching in facilitating your understanding of the practical skill on urinary catheterization?
- a. Very Ineffective
  - b. Ineffective
  - c. Neutral
  - d. Effective
  - e. Very Effective
9. How clear are the explanations provided in traditional teaching methods?
- a. Not Clear at All
  - b. Slightly Clear
  - c. Moderately Clear
  - d. Very Clear
  - e. Extremely Clear

## Video-Based Mode of Learning Questionnaire

### Demographic information

Study Number: \_\_\_\_\_

Sex: Female  Male

Age: \_ \_\_\_\_\_

Reported Disabilities: Hearing impairment  Visual impairment  None

### Questions on the perceived ease and usefulness of the video-based method of teaching

1. How effective do you find video lectures in explaining complex practical skill on urinary catheterization content?
  - a. Very Ineffective
  - b. Ineffective
  - c. Neutral
  - d. Effective
  - e. Very Effective
  
2. To what extent do video tutorials aid in your understanding of the practical skill on urinary catheterization ?
  - a. Not at all
  - b. Slightly
  - c. Moderately
  - d. Mostly
  - e. Completely
  
3. How engaging are video-based discussions or interactive sessions in your learning process?
  - a. Not Engaging at All
  - b. Slightly Engaging
  - c. Moderately Engaging
  - d. Very Engaging
  - e. Extremely Engaging

4. How well does video-based training facilitate practical application or hands-on learning?
- a. Not Well at All
  - b. Slightly Well
  - c. Moderately Well
  - d. Very Well
  - e. Extremely Well
5. How helpful do you find video-based assessments in evaluating your understanding of the practical skill on urinary catheterization?
- a. Not Helpful at All
  - b. Slightly Helpful
  - c. Moderately Helpful
  - d. Very Helpful
  - e. Extremely Helpful
6. How motivating are video-based learning materials in encouraging your active participation in the practical skill on urinary catheterization?
- a. Not Motivating at All
  - b. Slightly Motivating
  - c. Moderately Motivating
  - d. Very Motivating
  - e. Extremely Motivating
7. How well does video-based training accommodate diverse learning styles?
- a. Not Well at All
  - b. Slightly Well
  - c. Moderately Well
  - d. Very Well
  - e. Extremely Well

8. How relevant and up-to-date do you find the practical skill on urinary catheterization material delivered through video-based training?

- a. Not Relevant at All
- b. Slightly Relevant
- c. Moderately Relevant
- d. Very Relevant
- e. Extremely Relevant

9. How effective are video presentations in facilitating your understanding of the practical skill on urinary catheterization?

- a. Very Ineffective
- b. Ineffective
- c. Neutral
- d. Effective
- e. Very Effective

10. How clear are the explanations provided in video-based training methods?

- a. Not Clear at All
- b. Slightly Clear
- c. Moderately Clear
- d. Very Clear
- e. Extremely Clear

## Intention to Use Video-based Learning Questionnaire

### Demographic information

Study Number: \_\_\_\_\_

Sex: Female  Male

Age: \_ \_\_\_\_\_

Reported Disabilities: Hearing impairment  Visual impairment  None

### Questions assessing the intention of the students to use video-based learning

1. I intend to use videos as a supplementary tool to learn clinical nursing skills after training sessions.
  - a. Strongly Disagree
  - b. Disagree
  - c. Neutral
  - d. Agree
  - e. Strongly Agree
  
2. I believe videos can enhance my understanding of clinical nursing skills learned during training sessions.
  - a. Strongly Disagree
  - b. Disagree
  - c. Neutral
  - d. Agree
  - e. Strongly Agree
  
3. Integrating video-based learning into my clinical skill development after training sessions is something I am motivated to do.
  - a. Strongly Disagree
  - b. Disagree
  - c. Neutral
  - d. Agree

- e. Strongly Agree
4. I feel confident in my ability to effectively utilize video resources to reinforce my understanding of clinical nursing skills.
- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree
5. Using videos for learning clinical nursing skills post-training aligns with my preferred learning style.
- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree
6. I believe video-based learning could significantly improve my retention of clinical nursing procedures learned during training sessions.
- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

RESEARCHER'S OSPE/OSCE PRACTICAL GUIDE

**SCENARIO: FEMALE CATHETERIZATION.**

**At this station there is a model of a mother who is due for caesarean section you are required to pass the urinary catheter. The requirements are all set.**

**INSTRUCTIONS:**

- 1. Perform the procedure aseptically.**
- 2. Speak loud for examiner to hear.**
- 3. When the bell rings move to the next station.**

**OSPE/OSCE PRACTICAL GUIDE**

**RESEARCHER'S CHECKLIST.**

**Assessing the skills of performing female catheterization.**

researcher's name.....date.....

..... Candidate's No.....

NO	AREAS TO BE ASSESSED	SCORE	DONE	PARTIAL LY DONE	NOT DONE	TOTAL
1	Creates rapport with the patient.	1/2				
2	Explains the procedure	1/2				
3	Screen the bed and extends the trolley to the bedside.	1/2				
4	Position the patient, put the small mackintosh and towel to protect the linens	1/2				
5	Washes hands methodically and puts on surgical gloves.	1				
6	Inspects and cleans the vulva in a methodical way.	1				
7	Changes gloves and Drapes the patient	1/2				
8	Selects the appropriate catheter, checks for patency and lubricates the tip with k. y jelly.	1				
9	Place the receiver in between the thighs, use non dominant hand to expose the vulva, use dominant hand to insert slowly until urine is seen emptying into the receiver	1				
10	Injects into the catheter to balloon it and aid it remain in situ.	1				
11	Connects the catheter to the urinary bag and Fastens it on the thigh	1				
13	Measures the urine collected and records in the fluid balance chart.	1/2				
14	Clears away, leaves the mother comfortable and thank her.	1/2				
15	Washes hands and documents the findings.	1/2				
	<b>TOTAL</b>	<b>10</b>				

Researcher's comments.....  
 .....

## Appendix A

### Comparison of the Pre- and Post-Intervention on the perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization.

Statement	Response	Pre-Intervention (Count)	Pre-Intervention (%)	Post-Intervention (Count)	Post-Intervention (%)	Percentage Change
Video-based learning is very effective in explaining complex practical skill urinary catheterization content.	Strongly Disagree	1	3.30%	0	0.00%	-3.30%
	Disagree	3	10.00%	5	16.70%	6.70%
	Neutral	7	23.30%	9	30.00%	6.70%
	Agree	11	36.70%	10	33.30%	-3.40%
	Strongly Agree	8	26.70%	6	20.00%	-6.70%
If it is very easy to use videos to learn urinary catheterization.	Strongly Disagree	0	0.00%	0	0.00%	0.00%
	Disagree	4	13.30%	1	3.30%	-10.00%
	Neutral	7	23.30%	11	36.70%	13.40%
	Agree	17	56.70%	14	46.70%	-10.00%
	Strongly Agree	2	6.70%	4	13.30%	6.60%
Videos based methods of learning are NOT engaging and interacting at all learning process.	Strongly Disagree	0	0.00%	1	3.30%	3.30%
	Disagree	5	16.70%	7	23.30%	6.60%
	Neutral	9	30.00%	8	26.70%	-3.30%
	Agree	12	40.00%	10	33.30%	-6.70%
	Strongly Agree	4	13.30%	4	13.30%	0.00%
Video-based training facilitates practical application or hands-on learning catheterization.	Strongly Disagree	3	10.00%	2	6.70%	-3.30%

	Disagree	10	33.30%	10	33.30%	0.00%
	Neutral	9	30.00%	7	23.30%	-6.70%
	Agree	3	10.00%	9	30.00%	20.00%
	Strongly Agree	5	16.70%	2	6.70%	-10.00%
Using videos does not require a lot of my physical and mental effort.	Strongly Disagree	4	13.30%	2	6.70%	-6.60%
	Disagree	8	26.70%	4	13.30%	-13.40%
	Neutral	8	26.70%	8	26.70%	0.00%
	Agree	8	26.70%	14	46.70%	20.00%
	Strongly Agree	2	6.70%	2	6.70%	0.00%
Video-based learning materials motivate active participation in the practical skills on urinary catheterization.	Strongly Disagree	4	13.80%	2	6.70%	-7.10%
	Disagree	8	27.60%	4	13.30%	-14.30%
	Neutral	9	31.00%	10	33.30%	2.30%
	Agree	5	17.20%	10	33.30%	16.10%
	Strongly Agree	3	10.30%	4	13.30%	3.00%
Video-based training does NOT accommodate diverse learning styles.	Strongly Disagree	3	10.00%	1	3.40%	-6.60%
	Disagree	6	20.00%	9	31.00%	11.00%
	Neutral	6	20.00%	13	44.80%	24.80%
	Agree	11	36.70%	2	6.90%	-29.80%
	Strongly Agree	4	13.30%	4	13.80%	0.50%
Material delivered through video-based training is NOT relevant and up-to-date to promote practical skills on urinary catheterization.	Strongly Disagree	4	13.30%	1	3.30%	-10.00%
	Disagree	7	23.30%	5	16.70%	-6.60%
	Neutral	7	23.30%	16	53.30%	30.00%

Explanations provided in video-based training methods are very easily understood.	Agree	9	30.00%	8	26.70%	-3.30%
	Strongly Agree	3	10.00%	0	0.00%	-10.00%
	Strongly Disagree	0	0.00%	1	3.30%	3.30%
	Disagree	2	6.70%	0	0.00%	-6.70%
	Neutral	11	36.70%	6	20.00%	-16.70%
It is believed that doing this activity is useful for improved concentration.	Agree	9	30.00%	12	40.00%	10.00%
	Strongly Agree	8	26.70%	11	36.70%	10.00%
	Strongly Disagree	1	3.30%	1	3.30%	0.00%
	Disagree	3	10.00%	1	3.30%	-6.70%
	Neutral	8	26.70%	10	33.30%	6.60%
	Agree	11	36			

**Appendix B: Post Intervention Perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization before a teaching session on training videos.**

S/N	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13		
1	4	5	2	2	4	1	2	3	5	3	3	3	3	40	61.54
2	3	3	3	3	3	3	3	3	3	2	3	2	3	37	56.92
3	5	4	2	2	2	2	2	2	5	5	5	4	4	44	67.69
4	3	3	3	3	3	3	3	3	3	3	3	3	3	39	60.00
5	2	3	4	2	4	3	3	3	5	3	3	3	4	42	64.62
6	2	3	4	2	4	3	3	3	5	3	3	3	4	42	64.62
7	4	4	2	4	4	4	2	4	4	4	4	2	4	46	70.77
8	4	4	3	2	3	3	3	3	4	4	4	1	3	41	63.08
9	5	5	4	2	2	2	5	3	5	5	5	4	3	50	76.92
10	3	2	1	1	1	1	1	1	1	1	1	1	5	20	30.77
11	4	4	2	4	4	4	2	4	4	4	4	2	4	46	70.77
12	3	3	3	3	3	3	3	3	3	3	3	3	3	39	60.00
13	4	4	5	4	4	5	2	2	5	5	5	2	5	52	80.00
14	4	4	4	4	4	4	4	4	4	4	4	4	4	52	80.00
15	4	4	4	4	4	4	4	4	4	4	4	4	3	51	78.46
16	3	3	3	3	4	4	3	3	4	4	5	3	4	46	70.77
17	3	4	5	3	4	5	3	4	5	3	4	3	4	50	76.92
18	3	3	2	4	3	4	3	2	4	5	3	3	3	42	64.62
19	3	4	5	1	5	2	3	4	3	3	4	2	4	43	66.15
20	5	4	3	5	4	5	5	4	4	5	4	1	1	50	76.92
21	5	4	2	4	2	4	2	2	4	4	4	2	4	43	66.15
22	5	4	4	5	1	4	2	3	4	4	5	4	3	48	73.85
23	4	5	5	3	5	5	5	2	5	5	5	2	4	55	84.62
24	2	3	4	4	3	4	2	3	3	4	4	3	3	42	64.62
25	3	3	3	3	3	3	3	3	3	3	3	3	3	39	60.00
26	2	3	4	2	4	3	3	3	5	3	3	3	4	42	64.62
27	2	3	4	2	4	3	3	3	5	3	3	3	4	42	64.62

28	4	4	2	4	4	4	2	4	4	4	4	2	4	46	70.77
29	4	4	3	2	3	3	3	3	4	4	4	1	3	41	63.08
30	5	5	4	2	2	2	5	3	5	5	5	4	3	50	76.92

**Appendix C: Pre- Intervention Perceived ease and usefulness of training videos among second year direct undergraduate nursing students to perform urinary catheterization before a teaching session on training videos.**

S/N	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Raw score	%score
1	3	3	3	2	3	4	5	2	2	3	2	4	4	40	61.54
2	2	3	3	3	4	3	4	4	3	3	2	2	3	39	60.00
3	4	4	3	2	4	2	4	4	4	4	4	2	4	45	69.23
4	5	4	4	5	1	2	5	3	4	3	4	1	3	44	67.69
5	5	5	4	2	1	3	1	1	5	5	4	1	5	42	64.62
6	2	3	3	4	2	4	3	3	4	5	4	2	4	43	66.15
7	4	4	4	3	3		4	4	4	4	4	2	3	43	66.15
8	3	3	3	2	2	2	2	2	3	2	3	2	3	32	49.23
9	4	4	2	3	5	1	3	3	3	5	5	3	2	43	66.15
10	3	3	4	4	2	2	3	3	3	2	3	3	4	39	60.00
11	4	4	4	5	4	5	4	5	4	4	4	4	5	56	86.15
12	4	4	4	3	5	1	5	4	2	3	3	4	5	47	72.31
13	4	2	5	1	3	2	3	4	3	3	3	3	5	41	63.08
14	3	4	3	2	1	1	2	1	5	4	4	2	3	35	53.85
15	3	3	2	2	2	4	2	3	4	3	3	3	2	36	55.38
16	2	2	5	1	1	1	5	5	3	1	2	5	2	35	53.85
17	4	4	4	3	3	4	4	2	4	4	4	2	4	46	70.77
18	1	2	5	5	4	5	1	1	5	5	5	5	2	46	70.77
19	4	4	3	4	4	2	2	2	4	4	4	2	5	44	67.69
20	5	5	5	1	2	3	3	4	5	2	3	3	4	45	69.23
21	5	4	4	3	3	3	4	2	3	4	4	3	4	46	70.77
22	5	4	2	3	2	3	2	2	5	5	5	2	3	43	66.15

23	4	4	3	3	3	3	4	4	3	3	3	3	3	43	66.15
24	5	4	4	2	3	3	1	5	5	5	5	1	4	47	72.31
25	3	4	3	2	4	3	4	2	3	4	5	1	4	42	64.62
26	3	2	4	2	4	2	4	4	3	3	3	2	4	40	61.54
27	4	4	4	2	2	4	4	4	4	4	4	2	3	45	69.23
28	5	4	4	3	4	2	4	3	5	4	5	3		46	70.77
29	4	3	2	5	3	3	3	3	3	4	3	3	4	43	66.15
30	5	4	2	5	2	5	2	1	5	5	5	1	5	47	72.31

**Appendix D: Pre- Intervention intent of second year direct undergraduate nursing students to use videos to learn clinical nursing skills**

S/N	Q1	Q2	Q3	Q4	Q5	Q6	Raw score	%score
1	4.0	4.0	5.0	4.0	4.0	4.0	25.0	71.4
2	4.0	4.0	3.0	3.0	3.0	3.0	20.0	57.1
3	4.0	4.0	4.0	2.0	2.0	4.0	20.0	57.1
4	4.0	5.0	3.0	4.0	4.0	2.0	22.0	62.9
5	5.0	5.0	5.0	3.0	5.0	5.0	28.0	80.0
6	4.0	3.0	4.0	4.0	3.0	3.0	21.0	60.0
7	4.0	3.0	4.0	4.0	4.0	4.0	23.0	65.7
8	4.0	4.0	4.0	4.0	2.0	3.0	21.0	60.0
9	4.0	4.0	3.0	3.0	3.0	3.0	20.0	57.1
10	3.0	3.0	4.0	2.0	3.0	2.0	17.0	48.6
11	2.0	4.0	4.0	5.0	4.0	5.0	24.0	68.6
12	5.0	5.0	4.0	4.0	3.0	3.0	24.0	68.6
13	2.0	3.0	3.0	2.0	3.0	3.0	16.0	45.7
14	5.0	5.0	4.0	4.0	3.0	4.0	25.0	71.4

15	4.0	5.0	4.0	4.0	4.0	5.0	26.0	74.3
16	4.0	4.0	2.0	3.0	5.0	5.0	23.0	65.7
17	4.0	4.0	4.0	4.0	3.0	3.0	22.0	62.9
18	5.0	5.0	5.0	4.0	5.0	5.0	29.0	82.9
19	4.0	4.0	4.0	4.0	3.0	4.0	23.0	65.7
20	4.0	4.0	5.0	3.0	5.0	5.0	26.0	74.3
21	4.0	4.0	5.0	5.0	4.0	4.0	26.0	74.3
22	5.0	5.0	5.0	4.0	4.0	4.0	27.0	77.1
23	3.0	4.0	4.0	4.0	3.0	4.0	22.0	62.9
24	5.0	5.0	5.0	5.0	5.0	5.0	30.0	85.7
25	5.0	5.0	5.0	3.0	3.0	5.0	26.0	74.3
26	4.0	3.0	3.0	3.0	3.0	4.0	20.0	57.1
27	4.0	4.0	4.0	4.0	4.0	4.0	24.0	68.6
28	5.0	5.0	5.0	4.0	4.0	4.0	27.0	77.1
29	3.0	3.0	3.0	4.0	4.0	4.0	21.0	60.0
30	2.0	5.0	4.0	4.0	1.0	4.0	20.0	57.1

**Appendix E: Post Intervention intent of second year direct undergraduate nursing students to use videos to learn clinical nursing skills**

S/N	Q1	Q2	Q3	Q4	Q5	Q6	Raw score	%score
1	5.0	5.0	4.0	5.0	4.0	3.0	26.0	74.3
2	4.0	3.0	3.0	3.0	3.0	4.0	20.0	57.1
3	4.0	4.0	4.0	2.0	4.0	4.0	22.0	62.9
4	3.0	3.0	3.0	3.0	3.0	3.0	18.0	51.4
5	4.0	5.0	5.0	4.0	5.0	3.0	26.0	74.3
6	4.0	5.0	5.0	4.0	5.0	3.0	26.0	74.3
7	4.0	4.0	4.0	4.0	4.0	4.0	24.0	68.6
8	4.0	4.0	4.0	4.0	4.0	4.0	24.0	68.6
9	3.0	4.0	2.0	3.0	3.0	3.0	18.0	51.4
10	3.0	2.0	1.0	1.0	1.0	1.0	9.0	25.7
11	4.0	4.0	4.0	4.0	4.0	4.0	24.0	68.6
12	3.0	3.0	3.0	3.0	3.0	3.0	18.0	51.4
13	4.0	4.0	4.0	5.0	5.0	4.0	26.0	74.3
14	4.0	4.0	4.0	4.0	4.0	4.0	24.0	68.6
15	3.0	3.0	3.0	3.0	3.0	3.0	18.0	51.4
16	3.0	3.0	3.0	3.0	4.0	4.0	20.0	57.1
17	3.0	4.0	5.0	5.0	4.0	3.0	24.0	68.6
18	3.0	4.0	3.0	5.0	4.0	4.0	23.0	65.7
19	4.0	4.0	4.0	4.0	3.0	4.0	23.0	65.7
20	5.0	4.0	3.0	5.0	5.0	5.0	27.0	77.1
21	4.0	4.0	4.0	4.0	3.0	4.0	23.0	65.7
22	4.0	3.0	4.0	5.0	4.0	4.0	24.0	68.6
23	5.0	5.0	5.0	5.0	5.0	5.0	30.0	85.7
24	4.0	3.0	3.0	4.0	3.0	4.0	21.0	60.0
25	3.0	3.0	3.0	3.0	3.0	3.0	18.0	51.4

26	4.0	5.0	5.0	4.0	5.0	3.0	26.0	74.3
27	4.0	5.0	5.0	4.0	5.0	3.0	26.0	74.3
28	4.0	4.0	4.0	4.0	4.0	4.0	24.0	68.6
29	4.0	4.0	4.0	4.0	4.0	4.0	24.0	68.6
30	3.0	4.0	2.0	3.0	3.0	3.0	18.0	51.4