

## Original Article

## Students' Learning by Producing Educational Audio-Visual Resources in Skills Education: A Mixed Study

**Sevda Korkut, PhD, RN**

Associate Professor, Erciyes University, Faculty of Health Sciences, Department of Nursing, Kayseri, Turkey

**Turkan Ulker, MSc, RN**

Research Asistant, Erciyes University, Faculty of Health Sciences, Department of Nursing, Kayseri, Turkey

**Correspondence:** Sevda Korkut, PhD, RN, Associate Professor, Erciyes University, Faculty of Health Sciences, Department of Nursing, Kayseri, Turkey E-mail: skorkut@erciyes.edu.tr

### Abstract

**Background:** By asking nursing students to produce a skills video, students' awareness of the most important aspects of teaching through attention, auditory and visual awareness can be increased and help them better understand the concepts taught.

**Aims:** This study was conducted to examine the effect of producing a skill video on the learning levels of nursing students and to determine the students' experiences and opinions about producing a skill video.

**Methods:** This study was conducted in two phases. The first phase was conducted as a quasi-experimental study, the second phase was conducted as qualitative research. The quantitative part was completed with the participation of 242 students. In-depth interviews were conducted with 14 students. The data were collected using the Student Introduction Form, The Blood Pressure Knowledge Test, The Blood Pressure Skill Practice Checklist and Form of Student Opinions on the Video Production Task in Skills Training.

**Results:** Almost all of the students stated that producing the skill video contributed positively to their learning of the skill. The knowledge score after the video was significantly higher than before the video.

**Conclusions:** Producing educational audio-visual resources allowed students to develop beyond learning the subject and acquiring the skill. The students' self-confidence improved, their communication-collaboration skills improved and they were psychologically prepared for clinical practice.

**Keywords:** Nursing, producing video, skill task, skill training, video

### Introduction

Psychomotor skills are an indispensable part of the nursing profession. Nursing skills are taught in the skills lab with mannequins where students observe and practice skills until the skill is acquired (Clerkin et al., 2022). The nursing curriculum supports students to learn basic skills before starting a clinical practice where these skills can be reinforced (Stone, Cooke, & Mitchell, 2020). Traditional delivery of nursing education through lectures and laboratory demonstrations is no longer sufficient to meet the learning needs of today's students (Hurst, 2016; Kapucu, 2017; Stone,

Cooke & Mitchel, 2020). As a result of the rapid and multifaceted development of technology and changes in traditional lifestyles, expectations, dispositions, personality features and learning styles are now changing between generations. In nursing education, there is a need to use teaching methods that will allow students to have realistic experiences, especially before clinical practice. A qualified nursing education that uses innovative, active learning methods and adapts to today's conditions will increase the quality of health services (Culha, 2019).

Generation Z, the new generation of nursing students, currently constitutes the majority of students in undergraduate nursing programs (Hampton, Welsh & Wiggins, 2020). This generation expects to be more interactive and reportedly wants to shift from teacher-centered to student-centered learning (Strand et al., 2017; Stone, Cooke & Mitchell, 2020). It is recommended that members of Generation Z, the first generation of the digital world, receive education with highly novel teaching styles that are different from traditional educational methods (Culha, 2019).

With the appropriate and correct use of technology in nursing education, an effective classroom environment can be created and clinical learning can be supported (Donkor, 2010). Bandura stated that the teaching styles preferred by students are a reflection of their learning styles (Bandura, Freeman & Lightey, 1999). Teaching different skills requires a variety of techniques and contemporary methods in addition to the traditional lecture method (Devi, Khandelwal & Das, 2019). Video-based training can be an appropriate method for teaching skills. The use of video-assisted instruction in nursing education increases the quality of education (Culha, 2019; Korhan et al., 2016).

Zarra (2017) explains that Generation Z students' brains are predisposed to understanding complex visual images and therefore visual approaches to teaching are more effective than others. For example, it is emphasized that Generation Z students will not learn by reading and listening to any PowerPoint® presentation. They learn through observation and experiential practice (Shatto & Erwin, 2017; Shatto & Erwin, 2016), so videos are invaluable in the learning of Generation Z students (Shatto & Erwin, 2016). However, the studies generally focused on the contribution of videos shown by educators to student development (Forbes, 2016; Stone, Cooke & Mitchell, 2020). It is stated in the literature that these students do not like to take lessons passively and want to be involved in learning (Seemiller & Grace, 2016). Providing practical knowledge or showing how content can be applied to the real world is important for this group of

learners (Roseberry-McKibbin, 2017; Seemiller & Grace, 2017). Engagement in learning has been associated with increased student academic achievement and subject recall (Miller & Butler, 2011). Therefore, it is thought that a task given to students in skills training will contribute more to their development and involve them in the process.

Based on what is known about Generation Z so far, it seems that a constructivist approach could be beneficial for this generation of students. A constructivist learning setting both facilitates learning and increases academic achievement (Ayaz & Sekerci, 2015). Students' positive views about the course can be influenced by many methods such as providing opportunities to create various presentation products, using audio-visual aids, using interactive activities (Hampton, Welsh & Wiggins, 2020). Mayer's theory of facilitating teaching methods using multiple sensory modes (Mayer, 2014) is useful in the field of teaching and learning. Video can enable this (Clerkin et al., 2022). A video developed on a skill can be played repeatedly before practice sessions, examinations and patient care, increasing accessibility for the learner to learn and review the skill (Clerkin et al., 2022). This is thought to increase skill and student satisfaction (Clerkin et al., 2022; Kim et al., 2017). Different teaching techniques should be used in nursing education depending on the skill and situation of the students. Considering the characteristics of Generation Z students, assigning tasks to students will ensure their participation in the process. This generation is constantly making videos and sharing posts on their phones. Therefore, video is a non-boring learning resource for them (Syah, Nurjanah & Mayu, 2020). It is thought that combining learning environments with methods that students will be satisfied with will positively affect learning. In particular, it is thought that students will experience repeated learning while producing skill videos. This study was conducted to examine the effect of producing a skill video on the learning levels of nursing students and to determine the students' experiences and opinions about producing a skill video.

## Method

**Study Design:** This study was conducted in two phases, qualitative and quantitative. The first phase of the study was conducted as a quasi-experimental study with a pretest and posttest design to determine the effect of producing a skill video on students' learning. The second phase was conducted as qualitative research. This phase was carried out to determine students' experiences and opinions about producing skill videos. COREQ was followed for the qualitative part of the study.

**Participants:** The study was conducted at the Nursing Department of a university. In this section, students are taught clinical nursing skills in the skill lab environment before clinical practice. Blood pressure measurement practice is taught in the first year. In this course, firstly the theoretical part of the subject is explained to the students. Then the practice is taught in the skill lab environment by having students practice on their friends. Before the skill training, the students are made to listen to korotkoff sounds and watch the skill video by the trainers. The population of the study consisted of all first-year nursing students (n=276) in the 2022-2023 academic year. Power analysis test was performed with G\*Power 3.1.9.2 program to determine the sample of the study. According to the results of the analysis, it was planned to continue the study with a minimum of 197 students at  $\alpha=0.05$  level, 0.2 effect value and 80% power, and the study was completed with the participation of 242 students. The qualitative part of the study was conducted through in-depth interviews with 14 volunteer students. The study included (1) first-year nursing students in the 2022-2023 academic year, (2) students who attended the theoretical part of the "pulse and blood pressure measurement" course, and (3) students who agreed to participate in the study. Students who (1) had previous manual blood pressure measurement experience, (2) did not attend the theoretical part of the "pulse and blood pressure measurement" course were not included in the study.

**Data Collection Tools:** The data were collected using the Student Introduction Form, The Blood Pressure Knowledge Test, The Skill Practice Checklist and Form of

Student Opinions on the Video Production Task in Skills Training.

**Student Introduction Form:** This form, which consisted of questions about students' socio-demographic characteristics and blood pressure measurement, was developed by the researchers.

**The Blood Pressure Knowledge Test:** The blood pressure knowledge test (BPKT) is a 20-item multiple-choice test. This test was developed to measure students' theoretical and practical knowledge of blood pressure. The items were developed by Takmak and Kuzu Kurban (2018) based on expert opinion and content validity. Their results showed that the BPKT is reliable as a short-item test. This test includes definitions, physiology, classification, affecting factors, measurement sites, planning, application auscultation/palpation measurement, and evaluation. A correct answer is scored as 1 point. The total score ranges from 0 to 20.

**The Skill Practice Checklist:** The checklist was developed based on literature review by the instructors for skill training. The checklist consists of steps for each intervention (general counseling and implementation) (Taşçı et al., 2018). Based on this rubric, each student's video steps were evaluated and students were given a score between 0 and 20 points.

**Form of Student Opinions on the Video Production Task in Skills Training:** This form includes questions about students' difficulties in producing skill videos, positive and negative aspects and their contribution to learning. The questions in the form are below;

- What was your experience in producing a skills video on blood pressure?
- What was the experience of preparing this task like for you?
- What do you think this task has brought you?
- Do you think this task has improved you and contributed to your learning?
- What do you think are the positive and negative aspects of this task?

**Data Collection:** First, the theoretical part of the course was explained to the students. Then the practice steps were explained to the students and each student was made to practice. At the end of the lesson, students who met the inclusion criteria were asked to complete the Student Introduction Form and

The Blood Pressure Knowledge Test. Then, all students in the class were asked to measure a person's blood pressure by following the checklist steps and record this practice on video. Students were given one week for this preparation. After the students shot their videos, they were asked to send their videos to the storage area determined by the researchers. Then, these videos were evaluated one by one by the researchers according to the checklists and the students were given performance scores according to the practice steps. After the videos were evaluated, a link to the research was sent to the students via an online survey and they were asked to fill out questions about blood pressure measurement. In addition, in-depth interviews were conducted with 14 students who wanted to participate in the qualitative part of the study through Zoom, and students' experiences and opinions on the task of producing videos in skills training were obtained. The interviews lasted 30-45 minutes. During these interviews, zoom recordings were taken by obtaining permission from the students to avoid data loss. Then, the qualitative statements of the students were written as transcripts and sent back to the students for confirmation. The flow chart of the research process is presented in Figure 1. The interviews were conducted by the researchers. One of the researchers has a PhD in nursing and the other is a PhD student. Both researchers, who are women, have many qualitative research experiences.

**Validity and Reliability:** In this study, some precautions were taken by the researchers to minimize or completely eliminate the factors affecting validity and reliability (Yıldırım & Şimşek, 2013). These precautions are given below. In order to increase the internal validity of the study, the interview form created to be used in the research was submitted to the control of two experts who are academicians in nursing before the practice. After the interviews with the students, the transcripts were sent back to them and they were given the opportunity to review and make changes if they wished. Information was given to each participant before the interview, a sincere chat environment was established between the participant and the researchers, and the

interviews lasted 30-45 minutes. The answers given by the participants are quoted in the results section without comment. In order to increase the external validity of the study, the design used in the study, the study group, the selection of the study group, the explanation of the data collection tool and process, the analysis of the data and the writing of the findings, and the roles of the researchers were explained in detail. In order to increase the internal reliability of the study, the findings were written without comment. Data loss was prevented by using a voice recorder. Qualitative data were read independently by two researchers and codes were created. Themes and sub-themes were created from the existing codes. During this process, consensus was reached between the researchers. To increase the external reliability of the research, the results were submitted to expert control and a consensus was reached after the data were confirmed to be consistent with the results and approval was obtained from the experts.

**Data Analysis:** The quantitative data obtained from the study were evaluated in IBM SPSS Statistics 25.0 statistical package program. The normal distribution of the data was evaluated by Shapiro Wilk normality test and Q-Q graphs. Descriptive statistics are given as frequency (n), percentage (%) and mean±standard deviation values. Blood Pressure Knowledge Test Scores of the participants before and after the video were compared with the Paired Sample t Test.  $p < 0.05$  was considered statistically significant.

Inductive content analysis was conducted on the qualitative data obtained from the interviews. The purpose of the analysis is understand the meaning that participants attribute to their experiences. Therefore, codes and themes were derived from the data (Polit & Beck, 2014). All written interviews were analyzed by the researchers. While writing the statements of the individuals, the participants were coded by giving numbers. All written interviews were read several times to understand the meanings conveyed. Then, meaningful expressions were identified, open coding was done, and themes were created. Both researchers created themes independently of each other. In the

independent evaluation, it was seen that the researchers reached similar results. The final themes were named and described in detail, supported by direct quotes from participants. In addition, themes were sent to two experts who are academicians in nursing and then a consensus was reached by the researchers.

**Ethical Consideration:** In order to conduct the study, an Academic Board Decision was obtained from the Faculty of Health Sciences and ethical approval (200/2023) was obtained from the University Ethics Committee. The purpose of the study was explained to the students included in the study and their consent was obtained for the study to be conducted.

## Results

### Quantitative Results

The mean age of the students who participated in the study was  $19.75 \pm 2.72$  and 88.8% were female. 95.9% of the students stated that producing videos contributed positively to their learning of skill practices. However, it was determined that 53.3% of the students had difficulties in producing videos and the majority of the students who had difficulties had difficulties in obtaining materials. In addition, the students' skill videos were independently evaluated by two researchers out of 20 points according to the skill checklist. According to this evaluation, the students received an mean score of  $15.16 \pm 3.19$  out of 20 in the evaluation of the videos according to the practice steps (Table 1).

When the blood pressure knowledge score of the students before and after the video was compared, it was determined that the knowledge score of the students after the video was significantly higher than before the video (Table 2).

### Qualitative Results

#### Theme 1. The Contribution of Producing Skill Videos to Students

##### Subtheme 1. Learning to Practice

The students stated that producing the skills video improved them a lot, that they made measurements many times before shooting the video, and that this improved their skills.

*"Of course, first and foremost, it helped me learn how to measure blood pressure correctly."(3)*

*"After repeating it many times on my own, I switched to video recording. I felt as if I had taken the blood pressure of many people."(13)*

##### Subtheme 2. Individual Development Outside of Knowledge

Students stated that they improved much more than learning the topic and its practice. Some students said that they learned not to give up in the face of difficulties.

*"It is important not to be discouraged by a first-time failure. I have learned this. Because I did a lot of missteps until I understood and practiced blood pressure measurement properly. But I finally got it right."(9)*

Some students said that having achieved something increased their self-belief.

*"It made me believe that I can do something."(4)*

*"While preparing this task, I felt the happiness of being able to achieve something on our own. It was nice to provide the necessary materials, then edit the video, and make an effort to learn by learning something." (14)*

Some students said that their communication skills had also improved.

*"I think I have improved myself in terms of how to communicate with the patient and my attitude towards the patient while measuring the patient's blood pressure. I also experimented a lot with my tone of voice and demeanor behind the camera." (2)*

Most of the students stated that it improved their self-confidence and increased their courage. Some students stated that acting in the video also required self-confidence and that it improved their self-confidence in this regard as well.

*"I gained experience, playing in front of a video requires self-*

*confidence, I became braver, my confidence increased." (11)*

*" My confidence increased after the trials I made for the video. I can apply it to a foreign patient without hesitation." (13)*

Some students said that their interest in their professions had increased, that they were enthusiastic and impatient to learn new subjects.

*"..... I felt a renewed sense of enthusiasm and began to look forward to what I would learn in the future." (4)*

In addition, some students stated that it positively affected their perception of the profession, they learned the importance of being disciplined in the profession and that they should strive more for their education.

*"It was an interesting experience and I felt that I learned something that I will do for the rest of my life, instead of trying to do a task that I will give to the instructor.." (9)*

*"... taught me to be disciplined in my profession. It taught me how to be serious and how I should behave in patient relations." (10)*

The students stated that it also prepared them psychologically for clinical practice.

*"Having my first experience on my family and acquaintances reduced my stress. I don't think we will have much difficulty when we go on internship because this assignment prepared us psychologically for the idea of working in a health institution." (12)*

Almost all of the students said that it increased the permanence of the practice.

*"It increased the permanence of learning the practice. Since I did it on my own, it was an application that I could apply without the need for a retraining." (13)*

Some students said that it was fun and that they enjoyed it.

*"I actually had a lot of fun shooting the video, I had difficulties while explaining it because of my inexperience, then they always made me measure my blood pressure at home" (4)*

## **Theme 2. Difficulties Experienced by Students While Producing the Video**

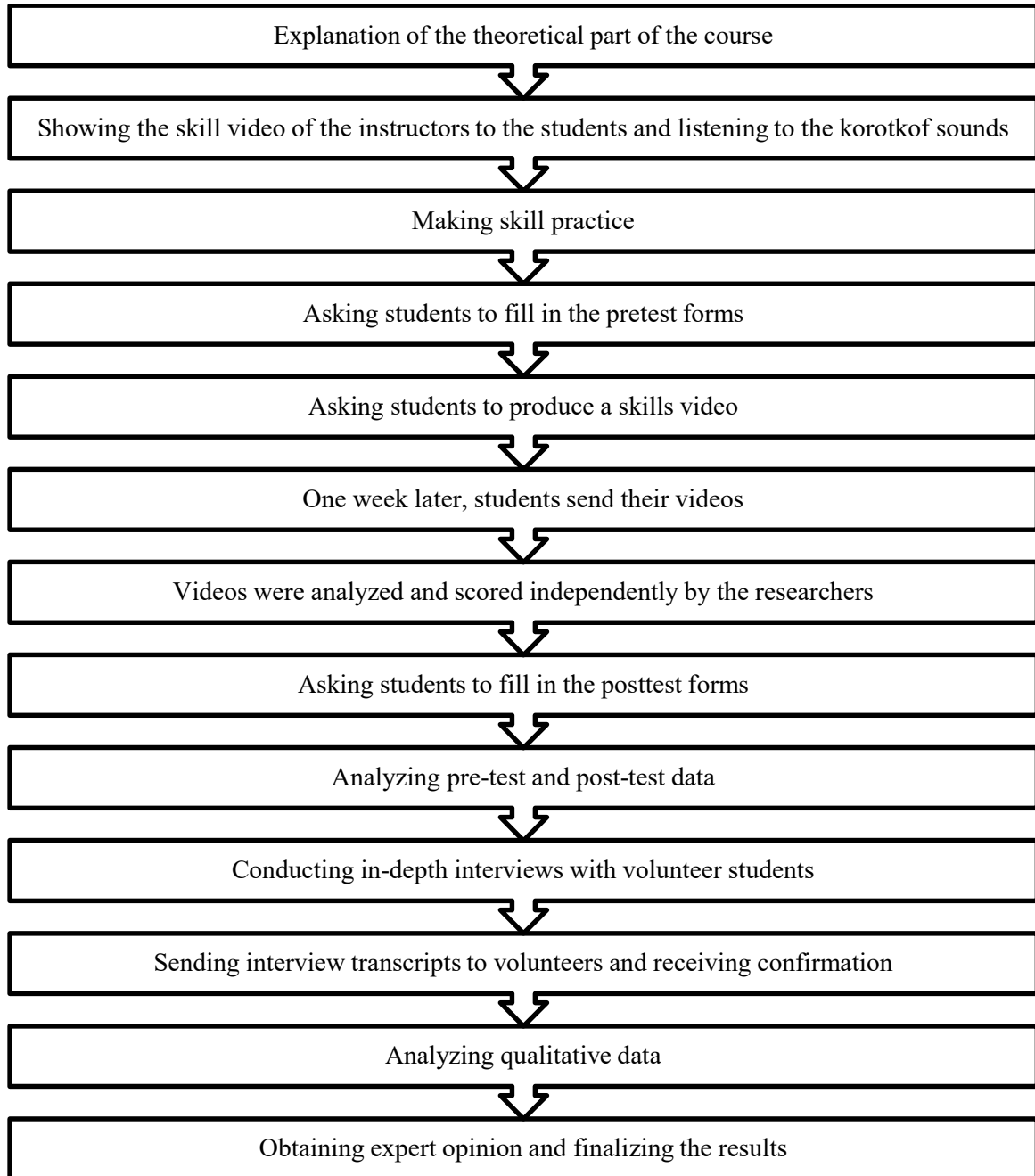
The majority of the students stated that they did not have the equipment to measure blood pressure at home and that they primarily had problems in obtaining the equipment. Some students received the material from neighbors, relatives and friends, while others bought it. Some students stated that they made measurements and shot videos in health institutions. Some of the students who shot videos especially in the health institution stated that they were very pleased with this practice. They stated that thanks to this task, they felt like an employee of a health institution and their love for the profession increased. While some students stated that the staff at the health institution were very sincere to them, some students stated that they encountered negative attitudes at the health institution, but they learned that they should not be discouraged.

*"I went to the hospital to get one. Although it seemed like a difficulty at first, it turned into an advantage later. Because I met the nurses working at the hospital and warmed up to my profession." (Male, 19)*

*"When I asked for permission from the health center to make a video, they didn't want to give me any. And when they did, they expected me to do it completely the first time and didn't let me make any more videos. This didn't discourage me at all." (Female, 20)*

Some students stated that they had difficulty in hearing the korotkoff sounds during the measurement at first, but their ability to hear the sounds improved as they made repeated measurements for the video.

*"First, I practiced on more than one person because I had no previous experience in blood pressure measurement. At first, I had difficulty distinguishing the korotkoff sounds, but then the practice helped me learn the sounds." (3)*



**Figure 1. Research Process Flow Chart**

**Table 1. Characteristics of Participants Related to Their Introductory and Ability to Skill Practice**

Characteristic	<i>n=242</i>
<b>Age (Mean±SD)</b>	19.75±2.72
<b>Gender</b>	
Female n(%)	215(88.8)
Male n(%)	27(11.2)
<b>Thinking that producing a skill video on blood pressure measurement has a positive effect on learning blood pressure measurement</b>	
Yes n(%)	232(95.9)
No n(%)	10(4.1)
<b>Any difficulties encountered while preparing the video task</b>	
Yes n(%)	131(54.1)
No n(%)	111(45.9)
<b>Challenge encountered</b>	
Procurement of material	95(39.3)
Finding the person to be measured	11(4.5)
Preparing the video	4(1.7)
Hearing Korotkof sounds	15(6.2)
Acting in a video	4(1.7)
<b>Where the materials needed to measure blood pressure are obtained</b>	
I had it at home.	32(13.2)
I got it from a neighbor.	16(6.6)
I got it from a relative.	33(13.6)
I bought it from a health institution (family health center, pharmacy, etc.).	99(40.9)
I bought it.	56(23.1)
I bought it from a friend.	6(2.5)
<b>Skill evaluation score of videos (Mean±SD)</b>	15.16±3.19

**Table 2. Comparison of Students' Knowledge Scores Before and After Video Production**

	<b>BPKT score before</b>	<b>BPKT score after video</b>	<i>p</i> *
	<b>video Mean±SD</b>	<b>Mean±SD</b>	
<b>BPKT score</b>	13.51 ± 2.12	15.50 ± 1.74	<b>&lt;0.001</b>

\* Paired Sample t test, BPKT: The Blood Pressure Knowledge Test



## Discussion

The use of video during basic nursing skills training provides students' interest and motivation (Arslan et al., 2018). Furthermore, by asking nursing students to produce a skills video, students' awareness of the most important aspects of teaching through attention, auditory and visual awareness can be increased and help them better understand the concepts taught. Video editing also reduces unnecessary load by removing non-essential information, which, according to cognitive load theory, will increase learning potential (Youssef et al., 2023). The students stated that producing the skill video improved a lot, that they made measurements many times before shooting the video and therefore their skills improved. Almost all of the students said that it increased the permanence of the practice. It is thought that students who acted as teachers of the content of the videos felt that they had to gain in-depth knowledge about the topic in order to be able to explain it to others, which led to an improvement in their own learning (Navio-Marco et al., 2022). The knowledge test score before and after the video also supports this data.

Dyson and Frawley (2018) explained that inviting students to create a meaningful product or artifact and building mental models and understandings from them is an important factor in education. As in the studies by Campbell et al (2022) and Navio-Marco et al (2022), our results show that student-generated video engages students in an active learning activity. With a greater impact than expected, students explained that this exercise had improved them more than learning the subject. Videos are characterized as an easy way to learn and understand clinical skills (Navio-Marco et al., 2022). However, it is seen that there is a development that goes far beyond the student's mere learning and understanding of the subject. This is explained by the fact that some of the students in the study stated that apart from learning the subject, their communication skills improved, their self-confidence increased, they experienced a sense of achievement and their belief in themselves increased. Acquisition of all the skills necessary for successful and safe clinical practice can be achieved when students have the confidence to perform these

skills (Stone, Cooke & Mitchell, 2020). Albert Bandura's self-efficacy theory also explains this situation. Accordingly, what is necessary for a person to achieve a certain goal is the belief in one's ability to perform that action (Bandura, Freeman & Lightsey, 1999). Evidence also suggests that lack of confidence affects nursing students' ability to complete a task effectively (Lauder et al., 2008; Zieber & Sedgewick, 2018). In the qualitative part of this study, students talked about their self-perceived confidence, both in relation to blood pressure measurement and in their ability to accomplish things. In the findings of the study conducted by Navio-Marco et al (2022), students talked about their self-perceived trust through the video they created.

It is generally understood that satisfaction corresponds to the extent to which students enjoy their courses (Bedggood & Donovan, 2012) and is the product of factors such as engagement and skill development (Fisher, Perényi & Birdthistle, 2021). The students said that this task was fun and they enjoyed doing it. It is thought that students' satisfaction reflects positively on their learning. Some students also stated that they learned from this task that they should not give up in the face of difficulties. Some students stated that this task positively affected their perception of their profession, increased their interest in their profession, taught them the importance of being disciplined in their profession, made them enthusiastic and impatient to learn new subjects. The students even stated that this task prepared them psychologically for clinical practice. As can be seen, it is seen that the task given to the students to practice contributed to the multidimensional development of the students.

As a result, students can be developed in many cognitive, psychomotor and affective areas by giving them various tasks that will attract their interest in nursing skill practices. Especially before the students go to clinical practice, the stress they will experience in the first clinical practice can be reduced by increasing their self-confidence. These tasks can be used to help students get to know and like the profession.

**Limitations:** This study has several limitations. The fact that the study was conducted with nursing students of only one university is a limitation of the study. In addition, the absence of a control group in the study is another limitation due to the lack of comparability of the groups.

**Conclusion:** In nursing skills training, an active learning environment was created by giving students the task of producing educational audiovisual resources. It was observed that this task allowed students to develop beyond learning the subject and acquiring the skill. It was observed that students' self-confidence improved, their communication-collaboration skills improved and they were psychologically prepared for clinical practice thanks to this task. Based on the findings of this study, it is recommended that nurse educators should enable students to increase their development by using teaching methods appropriate to their characteristics.

Nursing students experience many difficulties in transferring the theoretical knowledge and skills taught at school to patient care due to many reasons such as the increasing complexity of health services, insufficient clinical practice areas, high number of students, changing student population, traditional teaching strategies lagging behind the age (Kim & Park, 2019; Culha 2019). Therefore, it is of great importance to use educational tools and strategies appropriate to the characteristics of nursing students in designing clinical learning environments in order to increase the quality of education and students' satisfaction. Knowing the learning preferences and characteristics of Generation Z students can help nurses and counselors better connect with them and increase motivation to learn in academic and clinical learning environments (Vizcaya-Moreno, & Pérez-Cañaveras, 2020).

## References

- Arslan, G.G., Ozden, D., Goktuna, G., & Ayik, C. (2018). A study on the satisfaction of students for the time spent watching video-based learning during their basic nursing skills' training. *Int J Caring Sci*, 11, 427–36
- Ayaz, M.F., & Sekerci, H. (2015). The effects of the constructivist learning approach on student's academic achievement: A meta-analysis study. *Turkish Online J Educ Technol*, 14(4), 143-156.
- Bandura, A., Freeman, W., & Lightsey, R. (1999). *Self-Efficacy: The Exercise of Control*. Springer, New York.
- Bedggood, R. E., & Donovan, J. D. (2012). University performance evaluations: What are we really measuring? *Studies in Higher Education*, 37(7), 825–842.
- Campbell, L.O., Heller, S., & Pulse, L. (2020). Student-created video: An active learning approach in online environments. *Interactive Learning Environments*, 1–10.
- Clerkin, R., Patton, D., Moore, Z., Nugent, L., Avsar, P., & O'Connor, T. (2022). What is the impact of video as a teaching method on achieving psychomotor skills in nursing? A systematic review and meta-analysis. *Nurse Education Today*, 111(2022), 105280. <https://doi.org/10.1016/j.nedt.2022.105280>
- Culha, I. (2019). Active learning methods used in nursing education. *Journal of Pedagogical Research*, 3(2), 74-86.
- Devi, B., Khandelwal, B., & Das, M. (2019). Comparison of the effectiveness of video-assisted teaching program and traditional demonstration on nursing students learning skills of performing obstetrical palpation. *Indian J Neonatal Med Res*, 24(2), 118-23.
- Donkor, F. (2010). The comparative instructional effectiveness of print-based and video-based instructional materials for teaching practical skills at a distance. *Int Rev Res Open Distance Learning*, 11, 1492-3831.
- Dyson, L.E., & Frawley, J.K. (2018). A student-generated video careers project: Understanding the learning processes in and out of the classroom. *International Journal of Mobile and Blended Learning*, 10(4), 32–51.
- Fisher, R., Perényi, Á, & Birdthistle, N. (2021). The positive relationship between flipped and blended learning and student engagement, performance and satisfaction. *Active Learning in Higher Education*, 22(2), 97–113.
- Forbes, H., Oprescu, F.I., Downer, T., Phillips, N.M., McTier, L., Lord, B., Barr, N., Alla, K., Bright, P., & Dayton, J. (2016). Use of videos to support teaching and learning of clinical skills in nursing education: A review. *Nurse Education Today*, 42, 53–56.
- Hampton, D., Welsh, D., & Wiggins, A.T. (2020). Learning preferences and engagement level of generation Z nursing students. *Nurse Educ*, 45(3), 160-164.
- Hurst, K.M. (2016). Using video podcasting to enhance the learning of clinical skills: a qualitative study of physiotherapy students' experiences. *Nurse Education Today*, 45, 206–211.

- Kapucu, S. (2017). The effects of using simulation in nursing education: a thorax trauma case scenario. *Int J Caring Sci*, 10(2), 1069–1074.
- Kim, J.H., & Park, H. (2019). Effects of smartphone-based mobile learning in nursing education: A systematic review and meta-analysis. *Asian Nursing Research*, 13(2019), 20-29.
- Kim, S.-J., Shin, H., Lee, J., Kang, S., & Bartlett, R. (2017). A smartphone application to educate undergraduate nursing students about providing care for infant airway obstruction. *Nurse Education Today*, 48, 145–152.
- Korhan, E.A., Tokem, Y., Yilmaz, D.U., & Dilemek, H. (2016). Video-based teaching and OSCE implementation in nursing psychomotor skills education: Sharing of an experience. *Izmir Katip Celebi Univ Fac Health Sci*, 1(1), 35–37.
- Lauder, W., Watson, R., Topping, K., Holland, K., Johnson, M., Porter, M., Roxburgh, M., & Behr, A. (2008). An evaluation of fitness for practice curricula: self-efficacy, support and self-reported competence in preregistration student nurses and midwives. *J Clin Nurs*, 17(14), 1858–1867.
- Mayer, R.E. (2014). Research-based principles for designing multimedia instruction. In: Benassi, V.A., Overson, C.E., & Hakala, C.M., (Eds), *Applying Science of Learning in Education*. Division 2, American Psychological Association.
- Miller, R.L., & Butler, J.M. (2011). Outcomes associated with student engagement. In: Miller, R.L., Amsel, E., Kowalewski, B.M., Beins, B.C., Keith, K.D., & Peden, B.F., eds. *Promoting Student Engagement, Volume 1: Programs, Techniques and Opportunities*. Kennesaw, GA: Society for the Teaching of Psychology, American Psychological Association.
- Navio-Marco, J., Ruiz-Gómez, L. M., Arguedas-Sanz, R., & López-Martín, C. (2022). The student as a prosumer of educational audio-visual resources: A higher education hybrid learning experience. *Interactive Learning Environments*, <https://doi.org/10.1080/10494820.2022.2091604>
- Polit, D.F., & Beck, C.T. (2014). Qualitative research. *Essentials of Nursing Research: Appraising Evidence for Nursing Practice* (8th ed). Wolters Kluwer Health, Philadelphia, 265-300.
- Roseberry-McKibbin, C. (2017). Generation Z rising: A professor offers some hints on engaging members of Gen Z, who are taking college campuses by storm. *ASHA Leader*, 22(12), 36-38.
- Seemiller, C., & Grace, M. (2017). Generation Z: Educating and engaging the next generation of students. *About Campus*, 22(3), 21-26.
- Seemiller, C., & Grace, M. (2016). *Generation Z Goes to College*. San Francisco, CA: John Wiley & Sons.
- Shatto, B., & Erwin, K. (2016). Moving on from Millennials: Preparing for generation Z. *J Contin Educ Nurs*, 47(6), 253–254.
- Shatto, B., & Erwin, K. (2017). Teaching Millennials and Generation Z: Bridging the generational divide. *Creat Nurs*, 23(1), 24–28.
- Stone, R., Cooke, M., & Mitchell, M. (2020). Undergraduate nursing students' use of video technology in developing confidence in clinical skills for practice: A systematic integrative literature review. *Nurse Education Today*, 84(2020), 104230.
- Strand, I., Gulbrandsen, L., Slettebo, A., & Naden, D. (2017). Digital recording as a teaching and learning method in the skills laboratory. *J Clin Nurs*, 26(17–18), 2572–2582.
- Syah, R.J., Nurjanah, S., & Mayu, V.P.A. (2020). Tikio (TikTok App Educational Video) based on the character education of Newton's Laws Concepts Preferred to Learning for generation Z. *Pancaran Pendidikan*, 9(4), 85-94.
- Takmak, S., & Kuzu Kurban, N. (2018). A new test in assessing the education of blood pressure measurement. *J Anatol Nurs Health Sci*, 21(4), 271-278.
- Tasci, S., Baser, M., Goris, S., et al. (2018). *Essential Nursing Skills Learning Guide*. Ankara: Academician Publisher; 63-87.
- Vizcaya-Moreno, M. F., & Pérez-Cañaveras, R. M. (2020). Social media used and teaching methods preferred by generation Z Students in the nursing clinical learning environment: A cross-sectional. *Int J Environ Res Public Health*, 17, 8267
- Yildirim, A., & Simsek, H. (2013). *Qualitative research methods in social sciences*. Seckin Publishing.
- Youssef, S.C., Aydin, A., Canning, A., Khan, N., Ahmed, K., & Dasgupta, P. (2023). Learning surgical skills through video-based education: A systematic review. *Surgical Innovation*, 30(2), 220–238.
- Zarra, E.J. (2017). *The Entitled Generation: Helping Teachers Teach and Reach the Minds and Hearts of Generation Z*. Rowman & Littlefield: New York, NY, USA.
- Zieber, M., & Sedgewick, M. (2018). Competence, confidence and knowledge retention in undergraduate nursing students — a mixed method study. *Nurse Education Today*, 62, 16–21.