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Effects of pecha kucha presentation pedagogy on nursing students' presentation skills: a quasi-experimental study in Tanzania

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Abstract

Introduction Ineffective and non-interactive learning among nursing students limits opportunities for students' classroom presentation skills, creativity, and innovation upon completion of their classroom learning activities. Pecha Kucha presentation is the new promising pedagogy that engages students in learning and improves students' speaking skills and other survival skills. It involves the use of 20 slides, each covering 20 seconds of its presentation. The current study examined the effect of Pecha Kucha's presentation pedagogy on presentation skills among nursing students in Tanzania.

Objectives The aim of this study was to establish comparative nursing student's presentation skills between exposure to the traditional PowerPoint presentations and Pecha Kucha presentations.

Methods The study employed an uncontrolled quasi-experimental design (pre-post) using a quantitative research approach among 230 randomly selected nursing students at the respective training institution. An interviewer-administered structured questionnaire adopted from previous studies to measure presentation skills between June and July 2023 was used. The study involved the training of research assistants, pre-assessment of presentation skills, training of participants, assigning topics to participants, classroom presentations, and post-intervention assessment. A linear regression analysis model was used to determine the effect of the intervention on nursing students' presentation skills using Statistical Package for Social Solution (SPSS) version 26, set at a 95% confidence interval and 5% significance level.

Results Findings revealed that 63 (70.87%) participants were aged ≤ 23 years, of which 151 (65.65%) and 189 (82.17%) of them were males and undergraduate students, respectively. Post-test findings showed a significant mean score change in participants' presentation skills between baseline ($M=4.07 \pm SD=0.56$) and end-line ($M=4.54 \pm SD=0.59$) that accounted for 0.4717 ± 0.7793 ; $p < .0001$ (95%CI) presentation skills mean score change with a medium effect size of 0.78. An increase in participants' knowledge of Pecha Kucha presentation was associated with a 0.0239 ($p < .0001$) increase in presentation skills.

Conclusion Pecha Kucha presentations have a significant effect on nursing students' presentation skills as they enhance inquiry and mastery of their learning content before classroom presentations. The pedagogical approach

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appeared to enhance nursing students' confidence during the classroom presentation. Therefore, there is a need to incorporate Pecha Kucha presentation pedagogy into nursing curricula and nursing education at large to promote student-centered teaching and learning activities and the development of survival skills.

Trial registration It was not applicable as it was a quasi-experimental study.

Keywords Nursing students, Pecha Kucha presentation pedagogy and presentation skills

Introduction

The nursing students need to have different skills acquired during the learning process in order to enable them to provide quality nursing care and management in the society [1]. The referred nursing care and management practices include identifying, analyzing, synthesizing, and effective communication within and between healthcare professionals [1]. Given an increasing global economy and international competition for jobs and opportunities, the current traditional classroom learning methods are insufficient to meet such 21st - century challenges and demands [2]. The integration of presentation skills, creativity, innovation, collaboration, information, and media literacy skills helps to overcome the noted challenges among students [2–4]. The skills in question constitute the survival skills that help the students not only for career development and success but also for their personal, social and public quality of life as they enable students to overcome 21st challenges upon graduation [2].

To enhance the nursing students' participation in learning, stimulating their presentation skills, critical thinking, creativity, and innovation, a combination of teaching and learning pedagogy should be employed [5–8]. Among others, classroom presentations, group discussions, problem-based learning, demonstrations, reflection, and role-play are commonly used for those purposes [5]. However, ineffective and non-interactive learning which contribute to limited presentation skills, creativity, and innovation, have been reported by several scholars [9–11]. For example, poor use and design of student PowerPoint presentations led to confusing graphics due to the many texts in the slides and the reading of about 80 slides [12–14]. Indeed, such non-interactive learning becomes boring and tiresome among the learners, and it is usually evidenced by glazing eyes, long yawning, occasional snoring, the use of a phone and frequent trips to the bathroom [12, 14].

With an increasing number of nursing students in higher education institutions in Tanzania, the students' traditional presentation pedagogy is insufficient to stimulate their presentation skills. They limit nursing student innovation, creativity, critical thinking, and meaningful learning in an attempt to solve health challenges [15, 16]. These hinder nursing students ability to communicate effectively by being able to demonstrate their knowledge

and mastery of learning content [17, 18]. Furthermore, it affects their future careers by not being able to demonstrate and express their expertise clearly in a variety of workplace settings, such as being able to present at scientific conferences, participating in job interviews, giving clinic case reports, handover reports, and giving feedback to clients [17–19].

Pecha Kucha presentation is a new promising approach for students' learning in the classroom context as it motivates learners' self-directed and collaborative learning, learner creativity, and presentation skills [20–22]. It encourages students to read more materials, enhances cooperative learning among learners, and is interesting and enjoyable among students [23].

Pecha Kucha presentation originated from the Japanese word "*chit chat*," which represents the fast-paced presentation used in different fields, including teaching, marketing, advertising, and designing [24–26]. It involves 20 slides, where each slide covers 20 s, thus making a total of 6 min and 40 s for the whole presentation [22]. For effective learning through Pecha Kucha presentations, the design and format of the presentation should be meaningfully limited to 20 slides and targeted at 20 s for each slide, rich in content of the presented topic using high-quality images or pictures attuned to the content knowledge and message to be delivered to the target audiences [14, 16]. Each slide should contain a primordial message with well-balanced information. In other words, the message should be simple in the sense that each slide should contain only one concept or idea with neither too much nor too little information, thus making it easy to be grasped by the audience [14, 17, 19].

The "true spirit" of Pecha Kucha is that it mostly consists of powerful images and meaningful specific text rather than the text that is being read by the presenter from the slides, an image, and short phrases that should communicate the core idea while the speaker offers well-rehearsed and elaborated comments [22, 28]. The presenter should master the subject matter and incorporate the necessary information from classwork [14, 20]. The audience's engagement in learning by paying attention and actively listening to the Pecha Kucha presentation was higher compared with that in traditional PowerPoint presentations [29]. The creativity and collaboration during designing and selecting the appropriate images and contents, rehearsal before the presentation, and

discussion after each presentation made students satisfied by enjoying Pecha Kucha presentations compared with traditional presentations [21, 22]. Time management and students' self-regulation were found to be significant through the Pecha Kucha presentation among the students and teachers or instructors who could appropriately plan the time for classroom instruction [22, 23].

However, little is known about Pecha Kucha presentation in nursing education in Sub-Saharan African countries, including Tanzania, since there is insufficient evidence for the research(s) that have been published on the description of its effects on enhancing students' presentation skills. Thus, this study assessed the effect of Pecha Kucha's presentation pedagogy on enhancing presentation skills among nursing students. In particular, the study largely focused on nursing students' presentation skills during the preparation and presentation of the students' assignments, project works, case reports, or field reports.

The study answered the null hypothesis $H_0=H_1$, which hypothesized that there is no significant difference in nursing students' classroom presentation skills scores between the baseline and end-line assessments. The association between nursing students' presentation skills and participants' sociodemographic characteristics was formulated and analyzed before and after the intervention. This study forms the basis for developing new presentation pedagogy among nursing students in order to stimulate effective learning and the development of presentation skills during the teaching and learning process and the acquisition of 21st - century skills, which are characterized by an increased competitive knowledge-based society due to changing nature and technological eruptions.

The current study also forms the basis for re-defining classroom practices in an attempt to enhance and transform nursing students' learning experiences. This will cultivate the production of graduates nurses who will share their expertise and practical skills in the health care team by attending scientific conferences, clinical case presentations, and job interviews in the global health market. To achieve this, the study determined the baseline and end-line nursing students' presentation skills during the preparation and presentation of classroom assignments using the traditional PowerPoint presentation and Pecha Kucha presentation format.

Methods and materials

Study area

This study was conducted in health training institutions in Tanzania. Tanzania has a total of 47 registered public and private universities and university colleges that offer health programs ranging from certificate to doctorate degrees [24, 25]. A total of seven [7] out of 47 universities

offer a bachelor of science in nursing, and four [4] universities offer master's to doctorate degree programs in nursing and midwifery sciences [24, 26]. To enhance the representation of nursing students in Tanzania, this study was conducted in Dodoma Municipal Council, which is one of Tanzania's 30 administrative regions [33]. Dodoma Region has two [2] universities that offer nursing programs at diploma and degree levels [34]. The referred universities host a large number of nursing students compared to the other five [5] universities in Tanzania, with traditional students' presentation approaches predominating nursing students' teaching and learning processes [7, 32, 35].

The two universities under study include the University of Dodoma and St. John's University of Tanzania, which are located in Dodoma Urban District. The University of Dodoma is a public university that provides 142 training programs at the diploma, bachelor degree, and master's degree levels with about 28,225 undergraduate students and 724 postgraduate students [26, 27]. The University of Dodoma also has 1,031 nursing students pursuing a Bachelor of Science in Nursing and 335 nursing students pursuing a Diploma in Nursing in the academic year 2022–2023 [33]. The St. John's University of Tanzania is a non-profit private university that is legally connected with the Christian-Anglican Church [36]. It has student enrollment ranging from 5000 to 5999 and it provides training programs leading to higher education degrees in a variety of fields, including diplomas, bachelor degrees, and master's degrees [37]. It hosts 766 nursing students pursuing a Bachelor of Science in Nursing and 113 nursing students pursuing a Diploma in Nursing in the academic year 2022–2023 [30, 31].

Study design and approach

An uncontrolled quasi-experimental design with a quantitative research approach was used to establish quantifiable data on the participants' socio-demographic profiles and outcome variables under study. The design involved pre- and post-tests to determine the effects of the intervention on the aforementioned outcome variable. The design involved three phases, namely the baseline data collection process (pre-test via a cross-sectional survey), implementation of the intervention (process), and end-line assessment (post-test), as shown in Fig. 1 [7].

Target population

The study involved nursing students pursuing a Diploma in nursing and a bachelor of science in nursing in Tanzania. The population was highly expected to demonstrate competences and mastery of different survival and life skills in order to enable them to work independent at various levels of health facilities within and outside Tanzania. This cohort of undergraduate nursing students

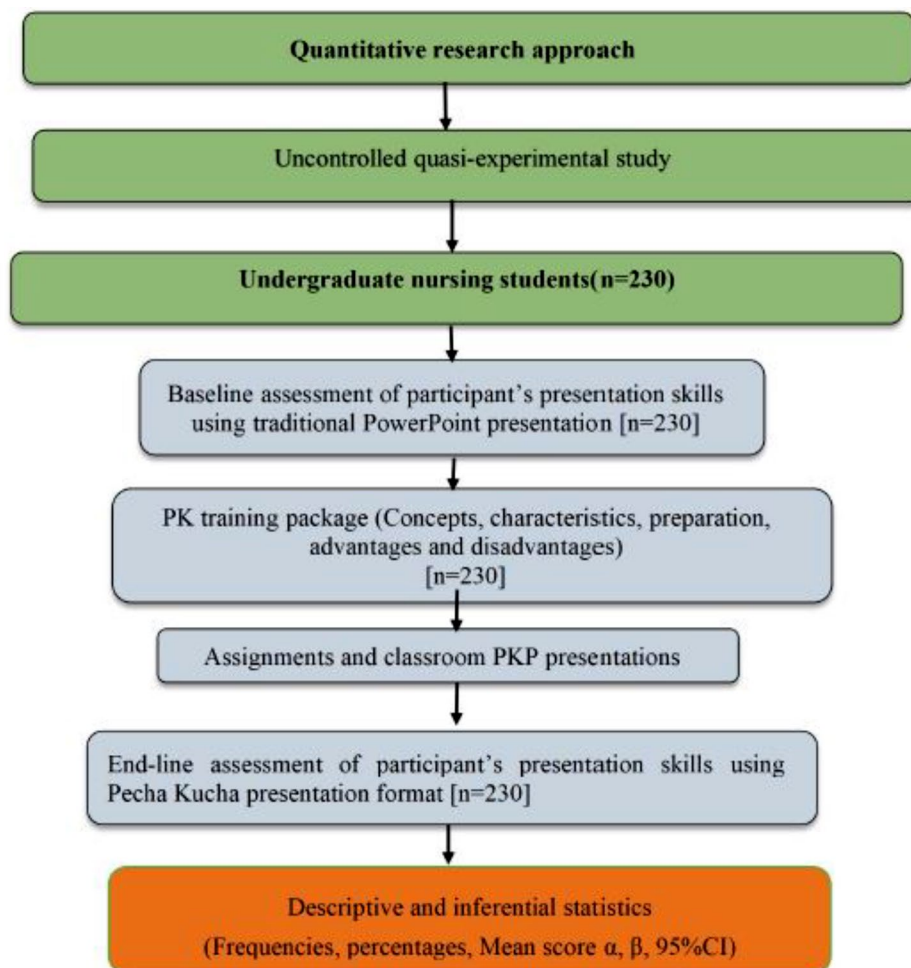


Fig. 1 A flow pattern of study design and approach

also involved adult learners who can set goals, develop strategies to achieve their goals, and hence achieve positive professional behavioral outcomes [7]. Moreover, as per annual data, the average number of graduate nursing students ranges from 3,500 to 4,000 from all colleges and universities in the country [38].

Study population

The study involved first- and third-year nursing students pursuing a Diploma in Nursing and first-, second-, and third-year nursing students pursuing a Bachelor of Science in Nursing at the University of Dodoma. The population had a large number of enrolled undergraduate nursing students, thus making it an ideal population for intervention, and it approximately served as a good representation of the universities offering nursing programs [11, 29].

Inclusion criteria

The study included male and female nursing students pursuing a Diploma in nursing and a bachelor of science in nursing at the University of Dodoma. The referred students included those who were registered at the University of Dodoma during the time of study. Such students live on or off campus, and they were not exposed to PK training despite having regular classroom attendance. This enhanced enrollment of adequate study samples from each study program, monitoring of study intervention, and easy control of con-founders.

Exclusion criteria

All students recruited in the study were assessed at baseline, exposed to a training package and obtained their post-intervention learning experience. None of the study participants, who either dropped out of the study or failed to meet the recruitment criteria.

Sample size determination

A quasi-experimental study on Pecha Kucha as an alternative to traditional PowerPoint presentations at Worcester University, United States of America, reported significant student engagement during Pecha Kucha presentations compared with traditional PowerPoint presentations [29]. The mean score for the classroom with the traditional PowerPoint presentation was 2.63, while the mean score for the Pecha Kucha presentation was 4.08. This study adopted the formula that was used to calculate the required sample size for an uncontrolled quasi-experimental study among pre-scholars [39]. The formula is stated as:

$$n = \frac{\{Z_{\alpha}\sqrt{[\pi_0(1 - \pi_0)]} + Z_{\beta}\sqrt{[\pi_1(1 - \pi_1)]}\}^2}{(\pi_1 - \pi_0)^2} \quad (1)$$

Where: Z_{α} was set at 1.96 from the normal distribution table.

Z_{β} was set at 0.80 power of the study.

Mean zero (π_0) was the mean score of audiences' engagement in using PowerPoint presentation = 2.63.

Mean one (π_1) was the mean score of audience's engagement in using Pecha Kucha presentation = 4.08.

$$n = \frac{\{1.96\sqrt{[2.63(1 - 2.63)]} + 0.80\sqrt{[4.08(1 - 4.08)]}\}^2}{(4.08 - 2.63)^2}$$

$$n = \frac{\{-8.40 + -12.566\}^2}{(1.45)^2}$$

$$n = \frac{439.57}{2.105}$$

$$n = 209 + 10\% \text{ non-response rate}$$

Total sample size comprised **230** nursing students.

Sampling technique

Given the availability of higher-training institutions in the study area that offer undergraduate nursing programs, a simple random sampling technique was used, whereby two cards, one labelled "University of Dodoma" and the other being labelled "St. Johns University of Tanzania," were prepared and put in the first pot. The other two cards, one labelled "yes" to represent the study setting and the other being labelled "No" to represent the absence of study setting, were put in the second pot. Two research assistants were asked to select a card from each pot, and consequently, the University of Dodoma was selected as the study setting.

To obtain the target population, the study employed purposive sampling techniques to select the school of

nursing and public health at the University of Dodoma. Upon arriving at the School of Nursing and Public Health of the University of Dodoma, the convenience sampling technique was employed to obtain the number of classes for undergraduate nursing students pursuing a Diploma in Nursing and a Bachelor of Science in Nursing. The study sample comprised the students who were available at the time of study. A total of five [5] classes of Diploma in Nursing first-, second-, and third-years and Bachelor of Science in Nursing first-, second-, and third-years were obtained.

To establish the representation for a minimum sample from each class, the number of students by sex was obtained from each classroom list using the proportionate stratified sampling technique (sample size/population size \times stratum size) as recommended by scholars [40]. To recruit the required sample size from each class by gender, a simple random sampling technique through the lottery method was employed to obtain the required sample size from each stratum. During this phase, the student lists by gender from each class were obtained, and cards with code numbers, which were mixed with empty cards depending on the strata size, were allocated for each class and strata. Both labeled and empty cards were put into different pots, which were labeled appropriately by their class and strata names. Upon arriving at the specific classroom and after the introduction, the research assistant asked each nursing student to pick one card from the respective strata pot. Those who selected cards with code numbers were recruited in the study with their code numbers as their participation identity numbers. The process continued for each class until the required sample size was obtained.

To ensure the effective participation of nursing students in the study, the research assistant worked hand in hand with the facilitators and lecturers of the respective classrooms, the head of the department, and class representatives. The importance, advantages, and disadvantages of participating in the study were given to study participants during the recruitment process in order to create awareness and remove possible fears. During the intervention, study participants were also given pens and notebooks in an attempt to enable them to take notes. Moreover, the bites were provided during the training sessions. The number of participants from each classroom and the sampling process are shown in Fig. 2 [7].

Data collection tools

The study adapted and modified the students' questionnaire on presentation skills from scholars [20, 23, 26–29]. The modification involved rephrasing the question statement, breaking down items into specific questions, deleting repeated items that were found to measure the same

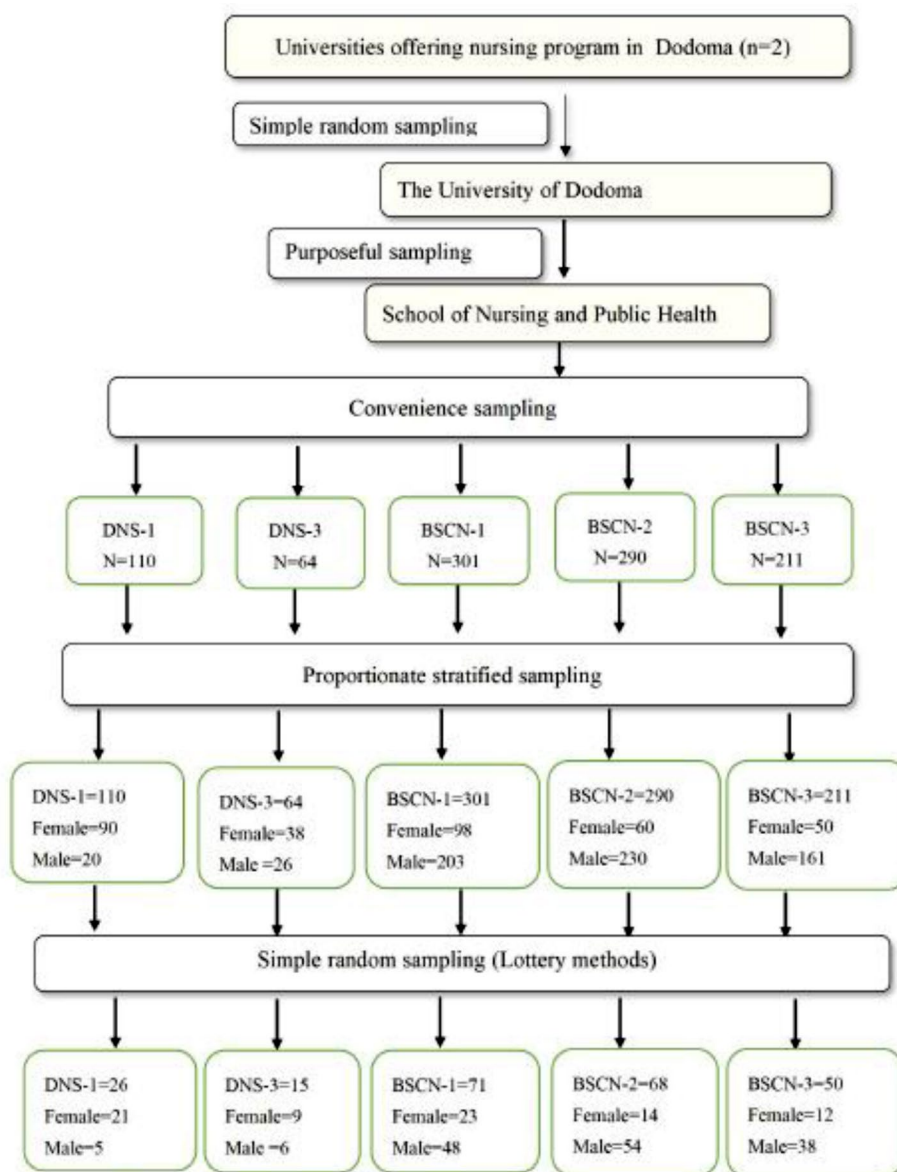


Fig. 2 Flow pattern of participants sampling procedures

variables, and improving language to meet the literacy level and cultural norms of study participants.

The data collection tool consisted of 68 question items that assessed the socio-demographic characteristics of the study participants and 33 question items rated on a five-point Likert scale, which ranges from 5=strongly agree, 4=agree, 3=not sure, 2=disagree, and 1=strongly disagree. The referred tool was used to assess the students’ skills during the preparation and presentation of the assignments using the traditional PowerPoint presentation and Pecha Kucha presentation formats.

The students’ assessment specifically focused on the students’ ability to prepare the presentation content, master the learning content, share presentation

materials, and communicate their understanding to audiences in the classroom context.

Validity and reliability of research instruments

Validity of the research instrument refers to whether the instrument measures the behaviors or qualities that are intended to be measured, and it is a measure of how well the measuring instrument performs its function [41]. The structured questionnaire, which intends to assess the participants’ presentation skills was validated for face and content validity. The principal investigator initially adapted the question items for different domains of students’ learning when preparing and presenting their assignment in the classroom.

The items were shared and discussed by two [2] educationists, two [2] research experts, one [1] statistician, and supervisors in order to ensure clarity, appropriateness, adequacy, and coverage of the presentation skills using Pecha Kucha presentation format. The content validity test was used until the saturation of experts' opinions and inputs was achieved. The inter-observer rating scale on a five-point Likert scale ranging from 5-points=very relevant to 1-point=not relevant was also used.

The process involved addition, input deletion, correction, and editing for relevance, appropriateness, and scope of the content for the study participants. Some of the question items were broken down into more specific questions, and new domains evolved. Other question items that were found to measure the same variables were also deleted to ease the data collection and analysis. Moreover, the grammar and language issues were improved for clarity based on the literacy level of the study participants.

Reliability of the research instruments refers to the ability of the research instruments or tools to provide similar and consistent results when applied at different times and circumstances [41]. This study adapted the tools and question items used by different scholars to assess the impact of PKP on student learning [12, 15, 18].

To ensure the reliability of the tools, a pilot study was conducted in one of the nursing training institutions in order to assess the complexity, readability, clarity, completeness, length, and duration of the tool. Ambiguous and difficult (left unanswered) items were modified or deleted based on the consensus that was reached with the consulted experts and supervisor before subjecting the questionnaires to a pre-test.

The study involved 10% of undergraduate nursing students from an independent geographical location for a pilot study. The findings from the pilot study were subjected to explanatory factor analysis (Set $\alpha \geq 0.3$) and scale analysis in order to determine the internal consistency of the tools using the Cronbach alpha of ≥ 0.7 , which was considered reliable [42–44]. Furthermore, after the data collection, the scale analysis was computed in an attempt to assess their internal consistency using SPSS version 26, whereby the Cronbach alpha for question items that assessed the participants' presentation skills was 0.965.

Data collection method

The study used the researcher-administered questionnaire to collect the participants' socio-demographic information, co-related factors, and presentation skills as nursing students prepare and present their assignments in the classroom. This enhanced the clarity and participants' understanding of all question items before providing the appropriate responses. The data were collected by the research assistants in the classroom with the study

participants sitting distantly to ensure privacy, confidentiality, and the quality of the information that was provided by the research participants. The research assistant guided and led the study participants to answer the questions and fill in information in the questionnaire for each section, domain, and question item. The research assistant also collected the baseline information (pre-test) before the intervention, which was then compared with the post-intervention information. This was done in the first week of June 2023, after training and orientation of the research assistant on the data collection tools and recruitment of the study participants.

Using the researcher-administered questionnaire, the research assistant also collected the participants' information related to presentation skills as they prepared and presented their given assignments after the intervention during the second week of July 2023. The participants submitted their presentations to the principle investigator and research assistant to assess the organization, visual appeal and creativity, content knowledge, and adherence to Pecha Kucha presentation requirements. Furthermore, the evaluation of the participants' ability to share and communicate the given assignment was observed in the classroom presentation using the Pecha Kucha presentation format.

Definitions of variables

Pecha kucha presentation

It refers to a specific style of presentation whereby the presenter delivers the content using 20 slides that are dominated by images, pictures, tables, or figures. Each slide is displayed for 20 s, thus making a total of 400 s (6 min and 40 s) for the whole presentation.

Presentation skills in this study

This involved students' ability to plan, prepare, master learning content, create presentation materials, and share them with peers or the audience in the classroom. They constitute the learning activities that stimulate creativity, innovation, critical thinking, and problem-solving skills.

Measurement of pecha kucha preparation and presentation skills

The students' presentation skills were measured using the four [4] learning domains. The first domain constituted the students' ability to plan and prepare the presentation content. It consisted of 17 question items that assessed the students' ability to gather and select information, search for specific content to be presented in the classroom, find out the learning content from different resources, and search for literature materials for the preparation of the assignment using traditional PowerPoint presentations and Pecha Kucha formats. It also aimed to ascertain a deeper understanding of the

contents or topic, learning ownership and motivation to learn the topics with clear understanding and the ability to identify the relevant audience, segregate, and remove unnecessary contents using the Pecha Kucha format.

The second domain constituted the students' mastery of learning during the preparation and presentation of their assignment before the audience in the classroom. It consisted of six [6] question items that measured the students' ability to read several times, rehearse before the classroom presentation, and practice the assignment and presentation harder. It also measures the students' ability to evaluate the selected information and content before their actual presentation and make revisions to the selected information and content before the presentation using the Pecha Kucha format.

The third domain constituted the students' ability to prepare the presentation materials. It consisted of six [6] question items that measured the students' ability to organize the information and contents, prepare the classroom presentation, revise and edit presentation resources, materials, and contents, and think about the audience and classroom design. The fourth domain constituted the students' ability to share their learning. It consisted of four [4] question items that measured the students' ability to communicate their learning with the audience, present a new understanding to the audience, transfer the learning to the audience, and answer the questions about the topic or assignment given. The variable was measured using a 5-point Likert scale. The average scores were computed for each domain, and an overall mean score was calculated across all domains. Additionally, an encompassing skills score was derived from the cumulative scores of all four domains, thus providing a comprehensive evaluation of the overall skills level.

Implementation of intervention

The implementation of the study involved the training of research assistants, sampling of the study participants, setting of the venue, pre-assessment of the students' presentation skills using traditional PowerPoint presentations, training and demonstration of Pecha Kucha presentations to study participants, and assigning the topics to study participants. The implementation of the study also involved the participants' submission of their assignments to the Principal Investigator for evaluation, the participants' presentation of their assigned topic using the Pecha Kucha format, post-intervention assessment of the students' presentation skills, data analysis, and reporting [7]. The intervention involved Principal Investigator and two [2] trained research assistants. The intervention in question was based on the concept of multimedia theory of cognitive learning (MTCL) for enhancing effective leaning in 21st century.

Training of research assistants

Two research assistants were trained with regard to the principles, characteristics, and format of Pecha Kucha presentations using the curriculum from the official Pecha Kucha website. Also, research assistants were oriented to the data collection tools and methods in an attempt to guarantee the relevancy and appropriate collection of the participants' information.

Schedule and duration of training among research assistants

The PI prepared the training schedule and venue after negotiation and consensus with the research assistants. Moreover, the Principle Investigator trained the research assistants to assess the learning, learn how to collect the data using the questionnaire, and maintain the privacy and confidentiality of the study participants.

Descriptions of interventions

The intervention was conducted among the nursing students at the University of Dodoma, which is located in Dodoma Region, Tanzania Mainland, after obtaining their consent. The participants were trained regarding the concepts, principles, and characteristics of Pecha Kucha presentations and how to prepare and present their assignments using the Pecha Kucha presentation format. The study participants were also trained regarding the advantages and disadvantages of Pecha Kucha presentations. The training was accompanied by one example of an ideal Pecha Kucha presentation on the concepts of pressure ulcers. The teaching methods included lecturing, brainstorming, and small group discussion. After the training session, the evaluation was conducted to assess the participants' understanding of the Pecha Kucha conceptualization, its characteristics, and its principles.

Each participant was given a topic as an assignment from the fundamentals of nursing, medical nursing, surgical nursing, community health nursing, mental health nursing, emergency critical care, pediatric, reproductive, and child health, midwifery, communicable diseases, non-communicable diseases, orthopedics and cross-cutting issues in nursing as recommended by scholars [21, 38]. The study participants were given 14 days for preparation, rehearsal of their presentation using the Pecha Kucha presentation format, and submission of the prepared slides to the research assistant and principle investigator for evaluation and arrangement before the actual classroom presentation. The evaluation of the participants' assignments involved the number of slides, quality of images used, number of words, organization of content and messages to be delivered, slide transition, duration of presentation, flow, and organization of slides.

Afterwards, each participant was given 6 min and 40 s for the presentation and 5 min to 10 min for answering

the questions on the topic presented as raised by other participants. An average of 4 participants obtained the opportunity to present their assignments in the classroom every hour. After the completion of all presentations, the research assistants assessed the participant's presentation skills using the researcher-administered questionnaire. The collected data were entered in SPSS version 26 and analyzed in an attempt to compare the mean score of participants' presentation skills with the baseline mean score. The intervention sessions were conducted in the selected classrooms, which were able to accommodate all participants at the time that was arranged by the participant's coordinators, institution administrators, and subject facilitators of the University of Dodoma, as described in Table 1 [7].

Evaluation of intervention

During the classroom presentation, there were 5 to 10 min for classroom discussion and reflection on the content presented, which was guided by the research assistant. During this time, the participants were given the opportunity to ask the questions, get clarification from the presenter, and provide their opinion on how the instructional messages were presented, content coverage, areas of strength and weakness for improvement, and academic growth. After the completion of the presentation sessions, the research assistant provided the questionnaire to participants in order to determine their presentation skills during the preparation of their

assignments and classroom presentations using the Pecha Kucha presentation format.

Data analysis

The findings from this study were analyzed using the Statistical Package for Social Science (SPSS) computer software program version 26. The percentages, frequencies, frequency distributions, means, standard deviations, skewness, and kurtosis were calculated, and the results were presented using the figures, tables, and graphs. The mean score analysis was computed, and descriptive statistical analysis was used to analyze the demographic information of the participants in an attempt to determine the frequencies, percentages, and mean scores of their distributions. A paired sample t-test was used to compare the mean score differences of the presentation skills within the groups before and after the intervention. The mean score differences were determined based on the baseline scores against the post-intervention scores in order to establish any change in terms of presentation skills among the study participants.

The association between the Pecha Kucha presentation and the development of participants' presentation skills was established using linear regression analysis set at a 95% confidence interval and 5% (≤ 0.05) significance level in an attempt to accept or reject the null hypothesis.

However, N-1 dummy variables were formed for the categorical independent variables so as to run the linear regression for the factors associated with the

Table 1 Descriptions of interventions between groups

Type of Intervention	Characteristics of Intervention
Sample size	230
Baseline Assessment	Pre-test
Intervention materials	PK guideline and curriculum for school, Pecha Kucha presentations, Pecha Kucha videos, projectors, learning pictures/images, notebook and pens, flip charts, marker pens, computers, learning notes
Topics	<i>Pecha Kucha Presentation</i>
Sessions	Concepts of Pecha Kucha presentation Principles and characteristics of Pecha Kucha presentation Advantages and disadvantages of Pecha Kucha presentation How to develop Pecha Kucha presentation
Timing	1 0.5 session
Duration	3 h
Venue	Classrooms
Facilitators	Principle Investigator and research assistant
Mode of delivery	Lecture, discussion and demonstration
Learners' roles	Listening, taking some notes, asking questions, demonstration
Facilitators' roles	Training how to design and develop Pecha Kucha presentations Demonstrating Pecha Kucha presentation
Assignments	Preparation of individual Pecha Kucha presentation Submission and presentation of the assignment in classroom context using Pecha Kucha presentation format
Class presentations	Presentation in entire class of study participants, answering questions, defending and addressing queries
Between presentation evaluation	Pecha Kucha presentation rubric
Session feedback	Session evaluation
End-line assessment	Post-test (immediate after intervention)

presentation skills. The linear regression equation with dummy variables is presented as follows:

$$Y = B_0 + B_1X_{1,1} + B_2X_{1,2} + \dots + B_{k-1}X_{1,k-1} + B_kX_2 + B_{k+1}X_3 + \varepsilon \quad (2)$$

Where:

- B_0 is the intercept.
- B_1, B_2, \dots, B_{k-1} are the coefficients which correspond to the dummy variables representing the levels of X_1 .
- B_k is the coefficient which corresponds to the dummy variable representing the levels of X_2 .
- B_{k+1} is the coefficient which corresponds to the continuous predictor X_3 .
- $X_{1,1}, X_{1,2}, \dots, X_{1,k-1}$ are the dummy variables corresponding to the different levels of X_1 .
- ε represents the error term.

The coefficients B_1, B_2, \dots, B_k indicate the change in the expected value of Y for each category relative to the reference category. If the Beta estimate is positive for the categorical or dummy variables, it means that the corresponding covariate has a positive impact on the outcome variable compared to reference category. However, if the beta estimate is positive for the case of continuous covariates, it means that the corresponding covariate has direct proportion effect on the outcome variables.

Normality

The distribution of the outcome variables was approximately normally distributed since the normality of the data is one of the requirements for parametric analysis. A paired t test was performed to compare the presentation skills of nursing students before and after the intervention.

Results

Social-demographic characteristics of the study participants

The study involved a total of 230 nursing students, of whom 151 (65.65%) were male and the rest were female. The mean age of study participants was 23.03 ± 2.69 , with the minimum age being 19 and the maximum age being 37. The total of 163 (70.87%) students, which comprised a large proportion of respondents, were aged less than or equal to 23, 215 (93.48%) participants were living on campus, and 216 (93.91) participants were exposed to social media.

A large number of study participants (82.17%) were pursuing a bachelor of Science in Nursing, with the majority being first-year students (30.87%). The total of 213 (92.61%) study participants had Form Six education as their entry qualification, with 176 (76.52%) participants being the product of public secondary schools and

interested in the nursing profession. Lastly, the total of 121 (52.61%) study participants had never been exposed to any presentation training; 215 (93.48%) students had access to individual classroom presentations; and 227 (98.70%) study participants had access to group presentations during their learning process. The detailed findings for the participants' social demographic information are indicated in Table 2 [46].

Baseline nursing students' presentation skills using traditional PowerPoint presentations

The current study assessed the participant's presentation skills when preparing and presenting the materials before the audience using traditional PowerPoint presentations. The study revealed that the overall mean score of the participants' presentation skills was 4.07 ± 0.56 , including a mean score of 3.98 ± 0.62 for the participants' presentation skills during the preparation of presentation content before the classroom presentation and a mean score of 4.18 ± 0.78 for the participants' mastery of learning content before the classroom presentation. Moreover, the study revealed a mean score of 4.07 ± 0.71 for participants' ability to prepare presentation materials for classroom presentations and a mean score of 4.04 ± 0.76 for participants' ability to share the presentation materials in the classroom, as indicated in Table 3 [46].

Factors Associated with participants' presentation skills through traditional PowerPoint presentation

The current study revealed that the participants' study program has a significant effect on their presentation skills, whereby being the bachelor of science in nursing was associated with a 0.37561 (P value < 0.027) increase in the participants' presentation skills. The year of study also had significant effects on the participants' presentation skills, whereby being a second-year bachelor student was associated with a 0.34771 (P value < 0.0022) increase in the participants' presentation skills compared to first-year bachelor students and diploma students. Depending on loans as a source of student income retards presentation skills by 0.24663 (P value < 0.0272) compared to those who do not depend on loans as the source of income. Furthermore, exposure to individual presentations has significant effects on the participants' presentation skills, whereby obtaining an opportunity for individual presentations was associated with a 0.33732 (P value 0.0272) increase in presentation skills through traditional PowerPoint presentations as shown in Table 4 [46].

Nursing student presentation skills through pecha kucha presentations

The current study assessed the participant's presentation skills when preparing and presenting the materials

Table 2 Social -demographic characteristics of study participants (n = 230)

Variable	Frequency n(%)	Mean ± StD (Minimum, Maximum)
Age category in years		23.03 ± 2.69 (19,37)
≤ 23	163(70.87)	
>23	67(29.13)	
Sex of the respondents		
Male	151(65.65)	
Female	79(34.35)	
Study of program		
Diploma of science in Nursing and Midwifery	41(17.83)	
Bachelor of science in Nursing	189(82.17)	
Year of study		
Diploma first year	26(11.30)	
Diploma third year	15(6.52)	
Bachelor first year	71(30.87)	
Bachelor second year	68(29.57)	
Bachelor third year	50(21.74)	
Entry level		
Form six	213(92.61)	
Equivalent qualification	17(7.39)	
Type of secondary school		
Public	176(76.52)	
Private	54(23.48)	
Accommodation status		
In campus	215(93.48)	
Off campus	15(6.52)	
Exposure social media		
No	14(6.09)	
Yes	216(93.91)	
Source of income		
Loan board	143(62.17)	
Parents	140(60.87)	
Private source	23(10.00)	
Interest in nursing professional		
Interested	206(89.57)	
Not interest	24(10.43)	
Exposure to presentation training?		
Exposed	109(47.39)	
Not exposed	121(52.61)	
What family type do you belong		
Nuclear family	106(46.09)	
Single parent family	50(21.74)	
Extended family	74(32.17)	
Exposure to individual presentation		
No	15(6.52)	
Yes	215(93.48)	
Exposure to group presentation		
No	3(1.30)	
Yes	227(98.70)	
Electronic owning		
No	137(59.57)	
yes	93(40.43)	

Table 3 Mean score of participants presentation skills using traditional PowerPoint presentation (n = 230)

Variable	Mean score ± StD
Preparation of Presentation Content before Classroom Presentation	3.98 ± 0.62
Mastery of the Learning Content before classroom Presentation	4.18 ± 0.78
Creating of Presentation Materials for Classroom Presentation	4.07 ± 0.71
Sharing of Presentation Materials in the Classroom	4.04 ± 0.76
Overall presentation	4.07 ± 0.56

before the audience using Pecha Kucha presentations. The study revealed that the overall mean score and standard deviation of participants' presentation skills using the Pecha Kucha presentation format were 4.54 ± 0.59 , including a mean score of 4.49 ± 0.66 for participant's presentation skills during preparation of the content before classroom presentation and a mean score of 4.58 ± 0.65 for participants' mastery of learning content before classroom presentation. Moreover, the study revealed a mean score of 4.58 ± 0.67 for participants ability to prepare the presentation materials for classroom presentation and a mean score of 4.51 ± 0.72 for participants ability to share the presentation materials in the classroom using Pecha Kucha presentation format as indicated in Table 5 [46].

Comparing Mean scores of participants' presentation skills between traditional PowerPoint presentation and pecha kucha Presentation

The current study computed a paired t-test to compare and determine the mean change, effect size, and significance associated with the participants' presentation skills when using the traditional PowerPoint presentation and Pecha Kucha presentation formats. The study revealed that the mean score of the participants' presentation skills through the Pecha Kucha presentation was 4.54 ± 0.59 (p value < 0.0001) compared to the mean score of 4.07 ± 0.56 for the participants' presentation skills using the traditional power point presentation with an effect change of 0.78. With regard to the presentation skills during the preparation of presentation content before the classroom presentation, the mean score was 4.49 ± 0.66 using the Pecha Kucha presentation compared to the mean score of 3.98 ± 0.62 for the traditional PowerPoint presentation. Its mean change was 0.51 ± 0.84 ($p < .0001$) with an effect size of 0.61.

Regarding the participants' mastery of learning content before the classroom presentation, the mean score was 4.58 ± 0.65 when using the Pecha Kucha presentation format, compared to the mean score of 4.18 ± 0.78 when using the traditional power point presentation. Its mean change was 0.40 ± 0.27 ($p < .0001$) with an effect size of 1.48. Regarding the ability of the participants to prepare

Table 4 Factors associated with participant's presentation skills through tradition power point presentation($n = 230$)

Variable	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	2.80632	0.43404	6.47	<0.0001
Age category in years	Ref			
> 23	0.08939	0.09559	0.94	0.3508
≤ 23	Ref			
Gender				
Male	0.15276	0.08238	1.85	0.0651
Female	Ref			
Study program				
Bachelor of science in Nursing	0.37561	0.16867	2.23	0.027
Diploma In Nursing	Ref			
Year of Study				
Diploma First year	0.1142	0.18093	0.63	0.5286
Diploma Third year	Ref			
Bachelor First year	0.24781	0.11054	2.24	0.026
Bachelor Second year	0.34771	0.11225	3.1	0.0022
Bachelor third year	Ref			
Entry level				
Equivalent Qualification	-0.0876	0.1607	-0.55	0.5862
Form Six	Ref			
Nature of secondary education school				
Public	0.1551	0.12644	1.23	0.2213
Private	Ref			
Accommodation status				
In campus	0.1029	0.15735	0.65	0.5138
Off campus	Ref			
Use of social media				
Using of Social Media Platform	0.18086	0.14749	1.23	0.2215
Not Using Social Media Platform	Ref			
Source of income as Students				
Loan board	-0.24663	0.11089	-2.22	0.0272
No Loan	Ref			
Source of income as Students				
From parents	-0.01018	0.0872	-0.12	0.9072
Not paid by parents	Ref			
Source of income as Students				
Private	0.29669	0.28209	1.05	0.2941
Not paying privately	Ref			
Interest to Nursing professional				
Interested	0.09468	0.1186	0.8	0.4256
Not interested	Ref			
Prior presentation training				
Exposed to training	0.03833	0.07112	0.54	0.5904
Not exposed to training	Ref			
Family Type				
Nuclear	0.1315	0.07566	1.74	0.0837
Extended	Ref			
Opportunity Individual Presentation				
Have opportunity for individual presentation	0.33732	0.14936	2.26	0.0249
No opportunity for individual	Ref			
Opportunity group Presentation				
Have opportunity for group presentation	0.00536	0.31347	0.02	0.9864
No opportunity for group presentation	Ref			

Table 5 A mean score of participant's presentation skills using Pecha Kucha presentation ($n = 230$)

Variable	Mean score \pm StD
Preparation of Presentation Content before Classroom Presentation	4.49 \pm 0.66
Mastery of the Learning Content before classroom Presentation	4.58 \pm 0.65
Creating of Presentation Materials for Classroom Presentation	4.58 \pm 0.67
Sharing of Presentation Materials in the Classroom	4.51 \pm 0.72
Overall presentation skills using Pecha Kucha presentation	4.54 \pm 0.59

the presentation materials for classroom presentations, the mean score was 4.58 ± 0.67 when using the Pecha Kucha presentation format, compared to 4.07 ± 0.71 when using the traditional PowerPoint presentation. Its mean change was 0.51 ± 0.96 ($p < .0001$) with an effect size of 0.53.

Regarding the participants' presentation skills when sharing the presentation material in the classroom, the mean score was 4.51 ± 0.72 when using the Pecha Kucha presentation format, compared to 4.04 ± 0.76 when using the traditional PowerPoint presentations. Its mean change was 0.47 ± 0.10 , with a large effect size of 4.7. Therefore, Pecha Kucha presentation pedagogy has a significant effect on the participants' presentation skills than the traditional PowerPoint presentation as shown in Table 6 [46].

Factors associated with presentation skills among nursing students through pecha kucha presentation

The current study revealed that the participant's presentation skills using the Pecha Kucha presentation format were significantly associated with knowledge of the Pecha Kucha presentation format, whereby increase

in knowledge was associated with a 0.0239 ($p < .0001$) increase in presentation skills. Moreover, the current study revealed that the presentation through the Pecha Kucha presentation format was not influenced by the year of study, whereby being a second-year student could retard the presentation skills by 0.23093 ($p = 0.039$) compared to a traditional PowerPoint presentation. Other factors are shown in Table 7 [46].

Discussion

Social-demographic characteristics profiles of participants

The proportion of male participants was larger than the proportion of female participants in the current study. This was attributable to the distribution of sex across the nursing students at the university understudy, whose number of male nursing students enrolled was higher than female students. This demonstrates the high rate of male nursing students' enrolment in higher training institutions to pursue nursing and midwifery education programs. Different from the previous years, the nursing training institutions were predominantly comprised of female students and female nurses in different settings. This significant increase in male nursing students' enrollment in nursing training institutions predicts a significant increase in the male nursing workforce in the future in different settings.

These findings on Pecha Kucha as an alternative to PowerPoint presentations in Massachusetts, where the proportion of female participants was large as compared to male participants, are different from the experimental study among English language students [29]. The referred findings are different from the results of the randomized control study among the nursing students in Ankara, Turkey, where a large proportion of participants were female nursing students [47]. This difference

Table 6 A paired t-test of participants presentation skills using traditional PowerPoint presentation (baseline) and using Pecha Kucha presentation (endline) ($n = 230$)

Variable	Mean \pm StD	Mean change	95% CI	t-Value	P-Value	Effect size
Preparation of Presentation Content		0.51 ± 0.84	0.40–0.62	9.13	< 0.0001	0.61
Baseline	3.98 ± 0.62					
Endline	4.49 ± 0.66					
Mastery of the Learning Content		0.40 ± 0.27	0.27–0.53	5.99	< 0.0001	1.48
Baseline	4.18 ± 0.78					
Endline	4.58 ± 0.65					
Creating of Presentation Materials		0.51 ± 0.96	0.38–0.63	8.03	< 0.0001	0.53
Baseline	4.07 ± 0.71					
Endline	4.58 ± 0.67					
Sharing of Presentation Materials		0.47 ± 0.10	0.34–0.60	7.15	< 0.0001	4.7
Baseline	4.04 ± 0.76					
Endline	4.51 ± 0.72					
Overall presentation skills		0.4717 ± 0.7793	0.3705 \pm 0.5730	9.18	< 0.0001	0.78
Baseline	4.07 ± 0.56					
Endline	4.54 ± 0.59					

in participants' sex may be associated with the difference in socio-cultural beliefs of the study settings, country's socio-economic status, which influence the participants to join the nursing profession on the basis of securing employment easily, an opportunity abroad, or pressure from peers and parents. Nevertheless, such differences account for the decreased stereotypes towards male nurses in the community and the better performance of male students in science subjects compared to female students in the country.

The mean age of the study participants was predominantly young adults with advanced secondary education. Their ages reflect adherence to national education policy by considering the appropriate age of enrollment of the pupils in primary and secondary schools, which comprise the industries for students at higher training institutions. This age range of the participants in the current study suits the cognitive capability expected from the participants in order to demonstrate different survival and life skills by being able to set learning goals and develop strategies to achieve their goals according to Jean Piaget's theory of cognitive learning [41, 42].

Similar age groups were noted in the study among nursing students in a randomized control study in Ankara Turkey where the average age was 19.05 ± 0.2 [47]. A similar age group was also found in a randomized control study among liberal arts students in Anakara, Turkey, on differences in instructor, presenter, and audience ratings of Pecha Kucha presentations and traditional student presentations where the ages of the participants ranged between 19 and 22 years [49].

Lastly, a large proportion of the study participants had the opportunity for individual and group presentations in the classroom despite having not been exposed to any presentation training before. This implies that the teaching and learning process in a nursing education program is participatory and student-centered, thus giving the students the opportunity to interact with learning contents, peers, experts, webpages, and other learning resources to become knowledgeable. These findings fit with the principle that guides and facilitates the student's learning from peers and teachers according to the constructivism theory of learning by Lev Vygotsky [48].

Effects of pecha kucha presentation pedagogy on participants' presentation skills

The participants' presentation skills were higher for Pecha Kucha presentations compared with traditional PowerPoint presentations. This display of the Pecha Kucha presentation style enables the nursing students to prepare the learning content, master their learning content before classroom presentations, create good presentation materials and present the materials, before the audience in the classroom. This finding was similar

to that at Padang State University, Indonesia, among first-year English and literature students whereby the Pecha Kucha Presentation format helped the students improve their skills in presentation [20]. Pecha Kucha was also found to facilitate careful selection of the topic, organization and outlining of the students' ideas, selection of appropriate images, preparation of presentations, rehearsing, and delivery of the presentations before the audience in a qualitative study among English language students at the Private University of Manila, Philippines [23].

The current study found that Pecha Kucha presentations enable the students to perform literature searches from different webpages, journals, and books in an attempt to identify specific contents during the preparation of the classroom presentations more than traditional PowerPoint presentations. This is triggered by the ability of the presentation format to force the students to filter relevant and specific information to be included in the presentation and search for appropriate images, pictures, or figures to be presented before the audience. Pecha Kucha presentations were found to increase the ability to perform literature searches before classroom presentations compared to traditional PowerPoint presentations in an experimental study among English language students at Worcester State University [29].

The current study revealed that Pecha Kucha presentations enable the students to create a well-structured classroom presentation effectively by designing 20 meaningful and content-rich slides containing 20 images, pictures, or figures and a transitional flow of 20 s for each slide, more than the traditional PowerPoint presentation with an unlimited number of slides containing bullets with many texts or words. Similarly, in a cross-sectional study of medical students in India, Pecha Kucha presentations were found to help undergraduate first-year medical students learn how to organize knowledge in a sequential fashion [26].

The current study revealed that Pecha Kucha presentations enhance sound mastery of the learning contents and presentation materials before the classroom presentation compared with traditional PowerPoint presentations. This is hastened by the fact that there is no slide reading during the classroom Pecha Kucha presentation, thus forcing students to read several times, rehearse, and practice harder the presentation contents and materials before the classroom presentation. Pecha Kucha presentation needed first year English and literature students to practice a lot before their classroom presentation in a descriptive qualitative study at Padang State University-Indonesia [20].

The current study revealed that the participants became more confident in answering the questions about the topic during the classroom presentation using the

Table 7 Factors associated with presentation skills among nursing students through Pecha Kucha presentation (n = 230)

Variable Name	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	3.62944	0.44066	8.24	<0.0001
Age category in years				
> 23	-0.04855	0.09498	-0.51	0.6098
≤ 23	0			
Gender				
Male	0.00275	0.0816	0.03	0.9732
Female	0			
Study program				
Bachelor of science in Nursing	0.2132	0.16718	1.28	0.2036
Diploma in Nursing	0			
Year of Study				
Diploma First year	-0.27904	0.17933	-1.56	0.1212
Diploma Third year	0			
Bachelor First year	-0.1995	0.10965	-1.82	0.0703
Bachelor Second year	-0.23093	0.11119	-2.08	0.039
Bachelor third year	0			
Entry level				
Equivalent Qualification	-0.11354	0.15948	-0.71	0.4773
Form Six	0			
Nature of secondary education school				
Public	-0.06675	0.12568	-0.53	0.5959
Private	0			
Accommodation status				
In campus	-0.1011	0.15625	-0.65	0.5183
Off campus	0			
Use of social media				
Using of Social Media Platform	0.07038	0.14658	0.48	0.6316
Not Using Social Media Platform	0			
Source of income as Students				
Loan board	-0.03403	0.10981	-0.31	0.757
No Loan	0			
Source of income as Students				
From parents	-0.03384	0.08691	-0.39	0.6974
Not paid by parents	0			
Source of income as Students				
Private	0.32957	0.27983	1.18	0.2402
Not paying privately	0			
Interest to Nursing professional				
Interested	0.17566	0.12046	1.46	0.1463
Not interested	0			
Prior presentation training				
Exposed to training	0.04086	0.07092	0.58	0.5651
Not exposed to training	0			
Family Type				
Nuclear	0.06534	0.07511	0.87	0.3853
Extended	0			
Opportunity Individual Presentation				
Have opportunity for individual presentation	-0.19005	0.14794	-1.28	0.2003
No opportunity for individual	0			
Opportunity group Presentation				
Have opportunity for group presentation	0.05062	0.31074	0.16	0.8708
No opportunity for group presentation	0			
PKP Knowledge				
Endline knowledge	0.0239	0.00324	7.37	<0.0001

Pecha Kucha presentation style than during the classroom presentation using the traditional PowerPoint presentation. This is precipitated by the mastery level of the presentation contents and materials through rehearsal, re-reading, and material synthesis before the classroom presentations. Moreover, Pecha Kucha was found to significantly increase the students' confidence during classroom presentation and preparation in a qualitative study among English language students at the Private University of Manila, Philippines [23].

Hence, there was enough evidence to reject the null hypothesis in that there was no significant difference in nursing students' presentation skills between the baseline and end line. The Pecha Kucha presentation format has a significant effect on nursing student's classroom presentation skills as it enables them to prepare the learning content, have good mastery of the learning contents, create presentation materials, and confidently share their learning with the audience in the classroom.

Conclusion

The current study's findings complement the available pieces of evidence on the effects of Pecha Kucha presentations on the students' learning and development of survival life skills in the 21st century. Pecha kucha presentations have more significant effects on the students' presentation skills compared with traditional PowerPoint presentations. It enables the students to select the topic carefully, organize and outline the presentation ideas, select appropriate images, create presentations, rehearse the presentations, and deliver them confidently before an audience. It also enables the students to select and organize the learning contents for classroom presentations more than traditional PowerPoint presentations.

Pecha Kucha presentations enhance the mastery of learning content by encouraging the students to read the content several times, rehearse, and practice hard before the actual classroom presentation. It increases the students' ability to perform literature searches before the classroom presentation compared to a traditional PowerPoint presentation. Pecha Kucha presentations enable the students to create well-structured classroom presentations more effectively compared to traditional PowerPoint presentations. Furthermore, Pecha Kucha presentations make the students confident during the presentation of their assignments and project works before the audience and during answering the questions.

Lastly, Pecha Kucha presentations enhance creativity among the students by providing the opportunity for them to decide on the learning content to be presented. Specifically, they are able to select the learning content, appropriate images, pictures, or figures, organize and structure the presentation slides into a meaningful and

transitional flow of ideas, rehearse and practice individually before the actual classroom presentation.

Strength of the study

This study has addressed the pedagogical gap in nursing training and education by providing new insights on the innovative students' presentation format that engages students actively in their learning to bring about meaningful and effective students' learning. It has also managed to recruit, assess, and provide intended intervention to 230 nursing students without dropout.

Study limitation

The current study has pointed out some of the strengths of the PechaKucha presentations on the students' presentation skills over the traditional students' presentations. However, the study had the following limitations: It involved one group of nursing students from one of the public training institutions in Tanzania. The use of one university may obscure the interpretation of the effects of the size of the intervention on the outcome variables of interest, thus limiting the generalization of the study findings to all training institutions in Tanzania. Therefore, the findings from this study need to be interpreted by considering this limitation. The use of one group of nursing students from one university to explore their learning experience through different presentation formats may also limit the generalization of the study findings to all nursing students in the country. The limited generalization may be attributed to differences in socio-demographic characteristics, learning environments, and teaching and learning approaches. Therefore, the findings from this study need to be interpreted by considering this limitation.

Suggestions for future research

The future research should try to overcome the current study limitations and shortcomings and extend the areas assessed by the study to different study settings and different characteristics of nursing students in Tanzania as follows: To test rigorously the effects of Pecha Kucha presentations in enhancing the nursing students' learning, the future studies should involve nursing students' different health training institutions rather than one training institution. Future studies should better use the control students by randomly allocating the nursing students or training institutions in the intervention group or control group in order to assess the students' learning experiences through the use of Pecha Kucha presentations and PowerPoint presentations consecutively. Lastly, future studies should focus on nursing students' mastery of content knowledge and students' classroom performance through the use of the Pecha Kucha presentation format in the teaching and learning process.

Abbreviations

Dr.	Doctor (PhD)
MTCL	Multimedia Theory of Cognitive Learning
NACTVET	National Council for Technical and Vocational Education and Training
PI	Principle Investigator
PKP	Pecha Kucha presentation
SPSS	Statistical Package for Social Sciences
TCU	Tanzania Commission for Universities
WHO	World Health Organization

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Author contributions

S.J.H: conceptualization, proposal development, data collection, data entry, data cleaning and analysis, writing the original draft of the manuscript W.C.M: Conceptualization, supervision, review, and editing of the proposal, and the final manuscript S.S.A: Conceptualization, supervision, review, and editing of the proposal and the final manuscript.

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Data availability

The datasets generated and analyzed by this study can be obtained from the corresponding author on reasonable request through harambasetberth@gmail.com & setberth.haramba@tnmc.go.tz.

Declarations

Ethics approval and consent to participate

All methods were carried out under the relevant guidelines and regulations. Since the study involved the manipulation of human behaviors and practices and the exploration of human internal learning experiences, there was a pressing need to obtain ethical clearance and permission from the University of Dodoma (UDOM) Institution of Research Review Ethics Committee (IRREC) in order to conduct this study. The written informed consents were obtained from all the participants, after explaining to them the purpose, the importance of participating in the study, the significance of the study findings to students' learning, and confidentiality and privacy of the information that will be provided. The nursing students who participated in this study benefited from the knowledge of the Pecha Kucha presentation format and how to prepare and present their assignments using the Pecha Kucha presentation format.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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