The Digital Story Teaching Method for Master of Nursing Specialist Students

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Abstract

As future healthcare professionals, Master of Nursing Specialist (MNS) students will play an important role in nursing and healthcare. MNS education emphasises the cultivation of students' critical and clinical thinking. Traditional classroom methods often result in students being unable to combine theory with practice and reduce their ability to problem-solve within the scope of clinical or professional services. However, in economically underdeveloped areas with insufficient educational resources, it is difficult to use real clinical situations or virtual reality technology to carry out teaching. To fill this gap, we introduced the digital story teaching method into classroom teaching in Shanxi Province in northern China, which is an economically underdeveloped agricultural province. Real clinical cases were adapted into stories, with integrated digital media elements. A before-and-after study design was adopted to compare the differences between the digital story teaching method group and the traditional teaching method group. The results indicate that students engaged in learning with the digital story teaching method demonstrated more active learning styles, clinical problem-solving skills, and higher academic achievements in classroom performance and examinations. As a continuous and low-cost flexible education

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method, the digital story teaching method is a teaching mode suitable for popularisation in areas where clinical teaching resources are relatively scarce.

Keywords: digital story teaching method; Master of Nursing Specialist; China; resource-scarce setting; nursing education

Introduction

The "people-centred" holistic nursing model urgently needs more clinical nursing experts who can creatively engage in nursing practice. Master of Nursing Specialist (MNS) is a type of degree set for training clinical nursing specialists. In recent years, among applied and enrolled MNS students in China, the newly graduated baccalaureate nursing students cohort was too large, and they lacked clinical experience, which has posed a severe challenge to realising the goal of cultivating clinical nursing specialists (Wu et al. 2018). Based on this goal, in 2018, we added the course Advanced Health Assessment to MNS teaching.

Advanced Health Assessment is a bridging course between basic and clinical nursing. It focuses on the transition from theoretical knowledge to clinical nursing practice ability, and strengthens and improves MNS students' ability to conduct comprehensive and systematic health assessment, so that they can provide practical, effective, and high-quality nursing for nursing patients in the field of clinical practice, thus laying a foundation for future clinical posts. Advanced Health Assessment usually adopts the traditional teaching method of teachers lecturing and writing on the blackboard and students listening and taking notes. However, for MNS students, if teaching simply increases information and knowledge, students cannot combine theory with practice, and there is a lack of cultivation of thinking quality and action ability to independently discover and solve clinical nursing problems (Yang and Huang 2018; Zhang, Xu, and Yan 2019), which is far from the goal of cultivating clinical nursing experts set by MNS. MNS education needs to build a broad foundation of clinical knowledge for students at the stage of school curriculum education, and cultivate students' critical thinking, clinical thinking, and clinical decision-making ability (Xu et al. 2022). More scientific and effective teaching methods have become imperative.

The first author's school is located in Shanxi Province in northern China, which is an economically underdeveloped agricultural province. The school has limited access to advanced teaching resources. Based on our practical conditions and teaching practice, we carried out the digital story teaching method in the teaching of Advanced Health Assessment for first-year MNS students. Based on real clinical cases, according to the teaching syllabus and clinical practice, the cases were adapted into stories and incorporated with appropriate digital media elements. Through storytelling and role playing, teachers' "teaching" and students' "learning" were integrated into specific clinical situations, and their ability to transform theoretical knowledge into clinical nursing practice ability was cultivated.

Storytelling is one of the oldest, most widely used, and most effective teaching strategies in many cultures (Yoder-Wise and Kowalski 2003). More than two thousand years ago, educators such as Confucius in China and Plato in ancient Greece used this method to educate their disciples. The famous child psychologist and educator, Jean Piaget, was the first to explicitly use the "storytelling method" in educational research. Piaget's *The Moral Judgment of the Child*, published in 1932, notes that the dual story method promotes the development of children's moral cognition (Valeri [1945] 1947). At the beginning of the 20th century, Chen Heqin, an educator in China, used the phrase "story teaching method" to carry out experimental research on story teaching, that is, to integrate teaching knowledge into stories, to realise the common development of teachers and students (Chen 1991). Because the story teaching method has more advantages than other teaching methods in improving students' interest and knowledge understanding, it is often used by educators and teachers, and has been widely studied and promoted in the field of education (Moon and Fowler 2008; O'Byrne et al. 2018; Werle 2004).

Research has shown that in clinical nursing education, the story teaching method is regarded as a supplement to traditional teaching methods, and beneficial attempts have been made in nursing professional courses (Gidman 2013; Timpani, Sweet, and Sivertsen 2021). Hou, Shen, and Fang (2013; Englund 2020) applied the story teaching method in their introduction to nursing, and found that it was beneficial for cultivating students' communication ability and the ability to integrate theory with practice to solve clinical problems. Wang (2018) introduced the story teaching method into classroom teaching of hospice care, which improved the attitude of the students towards hospice care and helped them realise the importance of relieving pain, giving family support, and caring ability. In addition, teaching practice showed that the story teaching method was helpful for students to understand professional terms and knowledge, participate in classroom activities more actively, and gain a sense of professional accomplishment. The story teaching method provides dialogues between teachers and students as well as among students to learn from one another and focus on professional practice, deepens the understanding of health and diseases, and helps to cultivate critical thinking ability (Anderson, Moxham, and Broadbent 2018; Mæland et al. 2021; Timpani, Sweet, and Sivertsen 2022).

With the continuous development and application of the story teaching method, the educational field began to combine the traditional art form of storytelling with modern information technology, integrating multimedia elements such as words, pictures, music, videos, and animation to create the process of visualising stories (Moreau et al. 2018; Robin 2016), namely the digital story teaching method. At present, the digital story teaching method is widely used in the field of education, and it has also been constantly developing in the field of medical care (DeLenardo et al. 2019; Mojtahedzadeh et al. 2021; Price et al. 2015). The digital story teaching method adds modern media elements to the traditional storytelling process, which makes the connection of story plots more appealing and expressive, thus attracting learners' interest and attention in a short time.

The digital story teaching method, which has both the characteristics of traditional stories as well as the interest and vividness of modern information technology, has positive and extensive influences on cultivating students' thinking, imagination, and creativity. Digital stories can better stimulate students' learning motivation and enrich the content and form of learning. Studies (Park, Forhan, and Jones 2021; Zarei et al. 2021) have shown that the application of the digital story teaching method can deepen students' understanding and memory of knowledge, and can play a positive role in cultivating innovative thinking and ability. In nursing education, the digital story teaching method promotes the reflection of participants and provides more possibilities for narrative nursing (Clisbee, Beierwaltes, and Eggenberger 2019; Rodríguez-Almagro et al. 2021; Urstad et al. 2018; Yocom 2021).

Materials and Methods

Participants

The experiment was conducted among 44 full-time MNS students in their first year at a university in Shanxi Province, China. A total of 25 students from Grade 2020 were taken as the experimental group and 19 students from Grade 2019 were taken as the control group. There were 42 women and two men. The average age was 24.1 years. All the students had the foundation of the undergraduate health assessment course and had probation/internship experience in a hospital. These students had never experienced the digital story teaching method before. All baseline characteristics were comparable between the two arms ($P>0.05$). The experimental group adopted the digital story teaching method, while the control group adopted the traditional teaching method, that is, the teacher lectured in dictation and wrote on the blackboard, and the students listened and took notes. The teachers, teaching materials, class hours, progress, and test evaluation standards for the two groups of students were consistent. There was no significant difference in age, entrance examination scores, or test paper difficulty ($P>0.05$). The school ethics committee approved the experiment, and all the students met the experimental requirements and participated voluntarily.

Experiment Team

The Advanced Health Assessment course team consisted of three members, including one full-time teacher (an associate professor and registered nurse, who holds a Doctor of Nursing Practice degree), one teaching assistant (a registered nurse, who has a Master of Science in Nursing degree) and one observer (a deputy chief nurse, who has a bachelor's degree), all of whom had been engaged in MNS teaching and clinical work for more than five years. The experiment team had completed systematic study of the digital story teaching method, mastered the teaching mode, and jointly completed the digital story teaching design. Before the experiment, the experiment scheme was further improved and revised by pre-experiment.

Pre-experiment Interview

Before the experiment, 25 MNS students were interviewed one-on-one with the semi-structured interview method to explore their evaluation of nursing health assessment and their understanding and expectation of studying the Advanced Health Assessment course. The interview lasted about 75 minutes. The results showed that 25 students expressed their understanding of the importance of nursing health assessment. It was considered that health assessment: emphasises the concept of "patient-centred holistic assessment"; can "better guide nursing practice"; decides "the quality of nursing work"; is conducive to "the formation of good professionalism"; and is "a basic skill that must be possessed in nursing work". However, it was generally difficult for students to master health assessment, and they believed that Advanced Health Assessment "greatly improved in depth and breadth compared with the undergraduate stage" and "pays more attention to clinical application and practicality". They expected the course to be "interesting and not boring"; hoped that the teaching "could be closely combined with nursing work"; and hoped to have "participation in the learning process".

Experiment Design and Arrangement

The design of the story teaching method should not only follow the basic principles of story design, but should also meet the teaching objectives of MNS and feasibility. It was implemented for eight weeks, with four class hours per week and 45 minutes per class hour, including teacher's teaching and student groups' cooperative learning. A total of 25 students were heterogeneously divided into four groups according to their personality, academic level, and aptitude. The group members performed role plays, case discussion, and cooperative learning, among others, according to the requirements of the digital story teaching method.

In this study, the digital story teaching was designed using the diabetes care in Unit 6, "Endocrine System Diseases", of Advanced Health Assessment as an example. The design idea was consistent with the idea of solving nursing problems in real clinical situations. That is, first discover and identify the problems to be solved, and then use professional knowledge for analysis and reasoning to obtain evidence that can explain the results and draw a conclusion.

Teachers should clearly define the purpose of creating storytelling scenes and play the role of a good producer-director. They should combine the five elements of the story: background, conflict, solution, ending, and enlightenment, and make a reasonable adaptation of the case. They should take the "incident conflict" (the patient's chief complaint, clinical manifestations, and health problems) as the axis, and launch solutions around it (health assessment, judging existing and potential health problems, obtaining medical/nursing diagnosis, implementation of treatment and nursing measures); produce the story ending (nursing ending, health outcome); and obtain inspiration (health education, critical thinking, clinical thinking, and stimulation of clinical decision-making ability). During this period, according to the different stages

of disease story development, different backgrounds were set using multimedia resources. Against this background, students were guided into the depicted scene, and then they participated in the story and became "I" in the story. Teachers should effectively control the timing of storytelling and dialogue situations, and the language should be expressive to realise teachers' and students' thinking combined with "situations", so that students can deepen their understanding and experience of health assessment in active thinking and emotional activities, and further enhance their critical thinking and clinical decision-making abilities.

Example of the Digital Story Teaching Method

Background

The narration was based on the classic lines in a movie of Hong Kong comedy star Stephen Chow: "We only guessed the beginning, but we did not guess the end …"[1] The prologue of the story was opened, arousing students' interest and thirst for knowledge. PowerPoint was used to arrange the "clinical work scene": the noisy surrounding background and the sound of an ambulance call (sound effect) from far to near signal the shift from a pre-hospital emergency environment to a real hospital, where students suddenly found themselves in a real emergency room. The patient was a 67-year-old male, who was played by a male classmate. Two other girls played the role of the patient's family.

Conflict

The patient was unconscious and could not respond upon calling. (Students performed offline while the video showed the real image of a coma patient.)

Solution

First, first aid was administered to the patient, such as maintaining airway patency, oxygen inhalation, monitoring vital signs, and opening venous access, among others (students operated offline with real medical appliances, and the video showed the real rescue process). At the same time as applying first aid, four groups of students discussed the possible causes of coma in groups. They drew up the outline of consultation with the knowledge they had learned and experienced the consultation steps and nurse-patient communication skills intuitively by role playing. Then, the teachers would subtly unfold the story plot of past history, personal history, and family history related to the patient's disease. With the corresponding videos, animations, and narration, students would follow the clues, discover, analyse, and judge the factors that led to the patient's abnormalities, and verify their own ideas about consultation. Then, the teachers narrated in flashback, supplemented by a PowerPoint short film, to show the patient's real daily life status, behaviour, family social support, and psychological and emotional state. To further guide students to think, they considered the following questions: What information should be evaluated with priority to clarify the nursing diagnosis and

[1] The movie is *A Chinese Odyssey*, released in 1995.

measures? What information needs to be improved? What physical examinations and auxiliary examinations should be performed? Students entered the patient's life in the story and independently completed the overall assessment of the patient's physiological state, psychological state, and living conditions.

Outcome

Through analysing the information, the students judged that the reason why the patient was unconscious and unresponsive was due to poor blood glucose control under type 2 diabetes and upper respiratory tract infection, which led to diabetic ketoacidosis. After proper medical care measures, the patient's consciousness became clear, acidosis was corrected, and fasting blood glucose, urine glucose, and urine ketone bodies were significantly improved. Through learning, students drew a flowchart of the diagnosis of diabetic ketoacidosis; they became familiar with the evaluation points of acute and chronic complications of diabetes, and could constantly adjust the evaluation points with the changes in the patient's condition. The overall assessment and guidance were conducted from three aspects, namely, the patient's physiology, psychology, and social situation. The main content of the follow-up after discharge was worked out, and special attention was paid to the medical care services in the community where the patient lived.

Enlightenment

Students deeply understood the following points: 1) that the primary matter of nursing is to save patients' lives. When patients are unconscious and unresponsive, they need to be rescued immediately on the spot, and at the same time, we should have good nursing work division, instead of ignoring the risk of patients and only performing the health assessment procedure step by step; 2) the importance of diagnosis and treatment thinking and knowledge reserve to nursing decision-making; 3) the importance of implementing the tertiary prevention goal of type 2 diabetes prevention and control; 4) diabetes daily self-management education is a compulsory course for patients; 5) health assessment not only includes the disease itself, but all aspects related to patients.

Outcome Evaluation

Students' Classroom Performance

Mobile phones were used to record students' classroom performance throughout the course. After the teaching, students were asked to watch the video and review their problems. Observers and teachers observed and recorded students' behaviour and learning completion, including students' classroom teaching interactions, knowledge construction, group division of labour and cooperation, and goal achievement.

Students' Learning Experience

After class, we conducted a student interview with the theme "Our Gains, Shortcomings, and Improvements" to obtain students' reflections on the digital story teaching method.

Students' professional tests included the following points: 1) In-class test: The test questions were compiled according to the teaching content of this class. The full score was 100 points, including multiple-choice questions (40 points) and case analysis questions (60 points). A written test was taken after the course, and the test time was 40 minutes. 2) Final test: one health assessment based on clinical real cases was completed. The full score was 100 points, including consultation (25 points), physical examination (25 points), auxiliary examination (25 points), and related assessment scales (25 points). The test time was 90 minutes. It included oral, written, and practical skills. In the test, the number of questions and scores were allocated according to the proportions of knowledge mastery, familiarity, and understanding of the syllabus. Scores were given according to the scoring criteria and reference answers. According to the scores, they were divided into four grades: 85 points and above were considered "excellent"; 75–84 points were graded "good"; 60–74 points were graded "qualified", and below 60 points was graded "unqualified".

Measurement of Students' Satisfaction with Teaching

Two weeks after the course, a self-developed questionnaire was used to investigate students' satisfaction with the digital story teaching method. It was evaluated along five dimensions: case story adaptation, storytelling, digital multimedia application, group learning, and role playing. Using a 5-point Likert scale, the options were classified as "very dissatisfied", "dissatisfied", "uncertain", "satisfied", and "very satisfied".

Statistical Analysis

Statistical Package for the Social Sciences (SPSS 22.0) was used for data analysis, and the statistical methods included descriptive statistics, such as mean, standard deviation, and percentage. The χ^2 test was used for inter-group comparison, and the difference was statistically significant when $P<0.05$.

Results

Students' Classroom Performance

The results of the classroom observation records showed that: 1) Students were focused, active in thinking, highly motivated in answering questions, able to break through the pre-set questions in the classroom and generate new questions, and gradually established higher-order thinking. 2) The group activities had a reasonable division of labour, mutual assistance from peers, complementary advantages, and high achievement of group goals.

Students' Learning Reflections

The interview results showed that the digital story teaching method was conducive to students' active learning ability, critical thinking ability, healthy holistic cognition, and empathy. Students believed that through the digital story teaching method they could make themselves clear about "meeting the clinical priorities needed by life", understand

"the patient's experience and deep psychological factors", and explore "the causes of illness"; they expressed that "after the story was understood, it was a matter of course to conduct a health assessment", and "the classroom knowledge could be understood and mastered, and the study burden was reasonable". In addition, through role playing, "from the perspective of bystanders, [they] saw the shortcomings in [their] own health assessment, such as ineffective nurse-patient communication and wrong physical examination".

Students' Professional Test

The professional test scores of the experimental and control groups are shown in Table 1. Table 1 shows that the average scores of the experimental group were significantly higher than those of the control group, regardless of the class test or the final test ($P<0.05$). The proportions of "excellent" scores in the experimental group in the classroom test and the final test were higher than those in the control group. The proportions of "qualified" and "good" students also increased slightly compared with the control group, and the proportions of "unqualified" students were lower than those of the control group. This shows that the digital story teaching method was superior to the traditional teaching method in improving the professional test scores.

Table 1: Comparison of professional test results between the two groups of students (*n* [%])

Group	**Number of people**	**Classroom test**				
		Average score	Excellent	Good	Qualified	Unqualified
			85 points and above	75–84 points	60–74 points	Below 60 points
Control group (Grade 2019)	19	75.58	5 （26.32）	7 （36.84）	6 （31.58）	1（5.26）
Experimental group (Grade 2020)	25	82.04	9 （36.00）	10 （40.00）	6 （24.00）	0（0）
Group	**Number of people**	**Final test**				
Control group (Grade 2019)	19	74.84	4 （21.05）	8 （42.11）	5 （26.32）	2（10.53）
Experimental group (Grade 2020)	25	81.04	9 （36.00）	8 （32.00）	8 （32.00）	0（0）

Students' Satisfaction with Teaching

Overall, 88% of the students were satisfied with the digital story teaching method. The dimension with the lowest satisfaction was "role playing", with 32% satisfied and 24% very satisfied. The highest degree of satisfaction was in relation to "storytelling", with 20% satisfied and 80% very satisfied. See Table 2 for details.

Table 2: Satisfaction of 25 students with the digital story teaching method (*n* [*%*])

Dimension	Very satisfied	Satisfied	Uncertain	Dissatisfied	Very dissatisfied
Case-based story adaptation	7(28.00)	13(52.00)	5(20.00)	0/(0)	0/(0)
Storytelling	20(80.00)	5(20.00)	0/(0)	0/(0)	0/(0)
Digital multimedia application	7(28.00)	10(40.00)	7(28.00)	1/(4.00)	0/(0)
Group learning	10(40.00)	12(48.00)	3(12.00)	0/(0)	0/(0)
Role playing	6(24.00)	8(32.00)	10(40.00)	1/(4.00)	0/(0)

Discussion

The digital story teaching method promoted students' interest and willingness to learn Advanced Health Assessment.

There is a great deal of memorised theoretical knowledge in nursing courses, which can easily induce students' learning tiredness and affect their persistence in learning participation. Yang et al. (2018) investigated the teachers in charge and 73 MNS students in 17 colleges offering Advanced Health Assessment courses, and found that 54.8% of the students thought that learning the course was very or moderately difficult, and the knowledge points were not easy to master. The pre-survey of this study also showed that students thought that nursing evaluation, decision-making, and practice were boring and their interest in learning was not high. Obscure knowledge and lifeless classrooms will eventually lose students' interest, let alone knowledge mastery. The essence of teaching lies in guidance, including methods, thoughts, and emotions, which are always accompanied by situations (Wu et al. 2018). The digital story teaching method combines the interest of stories with the visibility and role playing of multimedia to guide students into vivid clinical situations. Students relate to the characters in the story, empathise with the characters, and every knowledge point they find is as exciting as the discovery of "Easter eggs", which improves students' enthusiasm to participate in classroom teaching, and makes the originally boring and tedious classroom lively, full, and vivid, changing "the purpose of teaching" into "the need for learning" and "passive acceptance" into "active feeling", thereby improving

the sense of accomplishment and mastery of learning (Arveklev et al. 2018; McGovern 2019).

The Digital Story Teaching Method Helped Students to Deeply Understand the Holistic View of Health

The Neuman Systems Model implements the viewpoint of the holistic person, holistic health, and holistic nursing in the nursing process (Montano 2021). Modern nursing is facing a more complicated social and medical treatment environment, and a higher humanistic care demand than before, so it needs a more humanised overall health assessment model.

The digital story teaching method brings the clinic into the classroom, integrating typicality, story, and vividness, and allowing students to enter the patient's world from the perspective of "I" in order to experience the situation of the characters in the story in an immersive way, and to know that the "clinical scene" is not just a patient lying in a hospital bed, but also includes his/her family, work, social relations, and friends, as well as various emotions around them, such as joy, sadness, hope, and worry. In the process of health assessment, through listening and communication, the humanistic concept of health was integrated into patient nursing practice, which can stimulate learners' ability to empathise and avoid the non-holistic nursing perspective of "seeing only trees but not forests" (Glassman and Lewis 2022). Through digital story teaching, teachers also realise that evaluation of students' learning should not only pay attention to students' understanding and mastery of knowledge and skills, but also the formation and development of their emotions and attitudes.

The Digital Story Teaching Method Improved the Clinical Thinking Ability of the MNS Student Teams

The MNS students' learning stage can be regarded as the communication, sharing, and interaction of knowledge and resources by the learning group for common purposes at a specific stage. Through in-depth interaction and communication within and between groups, the digital story teaching method allows groups to embed with each other increasingly deeply, and gradually realises the continuous strengthening of group relations and the common improvement of learning efficiency (Rodríguez-Almagro et al. 2021). It is mainly reflected in two aspects. First, under the guidance of the team, individual learners can grasp the learning direction more clearly, and feel the happiness of group cooperation and sense of belonging more deeply. The sharing of resources and deep understanding among individuals also contribute to the promotion of goals. Second, the formation of groups promotes information exchange among students, and individuals can have meaningful reflections and understanding through interactions with other members within the group, so as to grasp knowledge, skills, and emotions in the story situation. The "stories" in the classroom are the future career scenes of MNS students. At this time, students are both learners and executors. They identify with their roles in the created situation and constantly ask themselves in the conflict: What would

I think when I meet this situation? How should my team make decisions? This helps students understand the value of problems from different angles and realise the active construction of knowledge. It cultivates students' abilities of emergency response, clinical observation, thinking and decision-making, communication, and teamwork (Park, Kwon, and Chung 2021).

The Digital Story Teaching Method Is a Teaching Mode Suitable for Popularisation in Low-Resource Areas

The best teaching method for health assessment is to effectively link theory with practice through probation/internships in clinical hospitals. However, this model is often limited by objective conditions, such as the lack of practice hospitals, the distance from schools, and the absence of special study places in hospitals. In addition, the occurrence of a disease is a continuous holistic process, so students cannot understand the whole picture of the disease in the limited probation/internship period, which affects the overall nursing evaluation. The digital story teaching method makes use of the school's resources, so that students can feel the complete real clinical situation in the classroom. This helps them grasp how to combine book knowledge and real cases, and learn from the story situation, so as to make a scientific nursing evaluation. As a continuous and low-cost flexible education method, the digital story teaching method is a teaching mode suitable for popularisation in areas where clinical teaching resources are relatively scarce. It makes up for the lack of support from conventional nursing education for students' clinical practice, thus cultivating more high-level, applied and specialised nurses for clinical nursing, which is also the main goal of MNS training.

Conclusions and Limitations

The digital story teaching method enables students to experience the process of knowledge generation through practice and in a free and pleasant classroom atmosphere, so as to cultivate their health assessment ability. The "story" comes from clinical practice and will eventually return to clinical practice. In the future, colleges should strengthen cooperation with clinical hospitals, set up a health assessment case database, deepen students' understanding of professional knowledge, and shorten the distance from classroom to clinical practice by adapting and telling more stories of real clinical cases. Teachers should also devote themselves to studying teaching materials, flexibly use the digital story teaching method, and fully mobilise students' initiative and enthusiasm in learning. Due to the limited number of students, observation time, and evaluation criteria, the conclusions of this study inevitably have certain limitations. In the future, we will further explore ways to refine the design, so as to make further discoveries.

Disclosure Statement

The authors report there are no competing interests to declare.

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