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Concurrent validity of video lessons in reinforcing medical and surgical nursing concepts

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Abstract

Purpose of the Study: Video presentations become a central ingredient in the teaching and learning milieu. This quantitative study aimed to assess the concurrent validity of video lessons in reinforcing medical and surgical nursing concepts to students.

Methodology: Records of one hundred sixteen (116) students were reviewed. Grades in posttest in video lessons and interactive discussions were correlated, compared, and regressed.

Results and Discussions: Findings reveal that students fared well in when medical and surgical concepts were reinforced with video lessons ($\bar{x}$ = 74.84) compared to interactive discussion alone ($\bar{x}$ = 56.29). Correlation coefficients revealed that there is significant positive association between video lesson and interactive discussion ($p < 0.01$) and to overall reinforcement outcomes ($p < 0.01$). A significant least-squares regression line of $y = 66.266 + 0.150x$ was determined, to which it validated the effectiveness of video lessons. Consistency can be observed in the implementation of video lessons as there are no observed differences in posttest grades across batches ($p = 0.488$).

Conclusion: This research supports current trends in the use of video lessons to aid teaching can serve as evidence include videos in the teaching and learning milieu.

Keywords: educational technology, instructional innovation, video lesson

Introduction

Throughout the ages, educators and scholars would argue that development of students occurs when knowledge, skills and attitudes are transferred correctly and adequately. This means that the teaching-learning process has to occur using relevant and responsive instruction, delivered by expert academicians, using a contemporary educational milieu. That is, the proficient educators who will teach the students should be aware of the exigencies and vicissitudes of the contemporary world; and that teachers should always utilize the best methods to affect learning.

In today's modern world, it cannot be denied that technology has become a tool for facilitating and catalyzing learning. Academicians in different learning institutions capitalized on these advancements and have developed quite a number of technologically-driven methods to incite curiosity and spark motivation among learners. Several researches have explored the effects of integrating technology and instruction. In the study of Gros,[1] it was revealed that children learn most when teaching is combined with multimedia. The author has considered that game-based learning environments are needed to improve learning among children. Nugent and colleagues[2] asserted that robotics and geospatial technology interventions effect greater learning among middle school students of science, technology, engineering and mathematics. They have found out that applying their type of educational intervention can encourage students about technology and seek out additional opportunities to explore subject topics in better detail. Effects of one-to-one technology policy in K-12 schools were also explored greatly as Harper and Milman[3] have conducted a meta-analysis on it. They asserted that themes such as effects on student achievement, changes to the classroom environment, classroom uses, effects on learner motivation and engagement, and challenges to classroom integration were evident in the examined researches from 2004 to 2014. Implications such as classroom improvement were made for future research. And in the Emirates, the effects of blended learning have been attracting attention and acceptance among graduate school faculty. Tamim[4] postulated that Arabian graduate students have an overall positive perception on blended learning. This finding espoused that blended learning would become successful only if it is student-centered, collaborative and student-led. Truly, the use of technology-based learning methods brings remarkable student outcomes.

Of all the methods in the arsenal of the tech-savvy teacher, the most commonly used would be the presentation of video lessons to supplement and augment concepts taught through traditional lectures and teaching methods. Time and again, this technological method has been utilized beyond boundaries of culture and classes. The benefits of video lessons can be observed scientifically as different researches posited a number of good effects. Akerele[5] found out that video lessons enhance attitudes towards learning among students of library studies. This could have been the case because interest and ideas are stimulated better. These findings affirmed the scientific discourse of Christensen[6] where positive learning attitudes are directed by use computers and technologies in the teaching environment. Greenberg and Zanetis,[7] in their commissioned research in 2012, described the impact of videos in education. They have observed the pedagogical impact of videos on students. That the youth interact more with the visual content in forms of speaking, note-taking or thinking; engages more when relating to the video subject; and fuses better knowledge and memory.

In healthcare professions education, video lessons become an integral aspect of transferring medical knowledge. Dwyer,[8] in his 1978 study, postulated that medical information was retained better by video presentation. This is because videos can present more data in a given

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space and time, simplify complex concepts, clarify pieces of abstract language-based concepts, demonstrate concepts/subjects that are in motion and/or relate to one another and be more efficient and effective at getting audience attention.[9] A study on the effectiveness of video-based education on gaining practical learning skills, conducted by Mouneghi and colleagues,[10] also recommended applying this teaching strategy in combination with actual demonstration to improve psychomotor learning. In the Philippines, nursing students also acquire better psychomotor learning in hand washing and wound care. These imply that video lessons can also bring improved skill acquisition in competency- and skill-based baccalaureate and technical programs.[11]

As evidences present the many positive effects of video lessons, it was not sufficient to describe its outcomes to concurrent modes of teaching. Few studies have demonstrated the content validity of video lessons compared with the traditional ones. Furthermore, the extent to which video lessons contribute to overall learning was poorly explored. Little is known on the interplay of visual and auditory presentation of lessons has an impact on summative learning. Likewise, the predictability of using videos in reinforcing medical and surgical concept were not succinctly explored, for there are still gray areas, encountered empirically, in the implementation of such learning activity.

Therefore, it is the goal of this study to:

Explore the association between posttest outcomes of video lessons and interactive discussions in medical and surgical nursing.

Ascertain if video lessons posttest outcomes predict better outcomes in reinforcing medical and surgical nursing concepts.

Determine whether there is difference in posttest outcomes of video lessons throughout the years of implementation.

Methodology

This evaluation research utilized a one-shot, case study design that explored the concurrent validity of video lessons vis-à-vis interactive discussion in producing learning outcomes. Respondents were nursing students enrolled in an in-house nursing review program of a higher education institution in Manila, Philippines. Research ethics clearance and administrative approval were sought prior to the access and review of student records.

Posttest results on video lessons and interactive discussion for the last three years were retrieved. Three cohorts of nursing students were identified with similar review programs in medical and surgical nursing. These groups received both video lesson and interactive discussion as modes of concept reinforcement. Data were statistically treated and findings were kept confidential. Table 1 presents the number of nursing students per cohort.

Table 1 Composition of nursing students

Nursing Student Group	Frequency (n)	Percentage
Cohort 1	59	50.90
Cohort 2	30	25.90
Cohort 3	27	23.30
Total	116	100.00

Mean and standard deviation of posttest results summarized the data collected. Two statistical procedures were employed to test concurrent validity of video lessons in reinforcing medical-surgical concept: one is using Pearson product moment correlation was used to explore relationship, and the other is using linear regression to prove predictability. And lastly, one-way analysis of variance was used to determine difference in performance of the cohorts. Data management and statistical software used was SPSS version 23.

Results and Discussion

This section contains the aggregation of data collected from the records of the health professions institute and results of the statistical tests that answered research questions.

Outcomes of Interactive Discussion

Table 2 shows the mean posttest grade of students after receiving an interactive discussion on medical and surgical nursing concepts. Batch 1 exhibited the highest posttest grade ($x_1 = 57.69$), followed by Batch 2 ($x_2 = 56.07$) and Batch 3 with the lowest posttest grade ($x_3 = 53.48$). It can be observed that the students did not achieve a passing mark for the exam. This can be explained by several internal factors. Firstly, the voluminous concepts that come with studying medical and surgical nursing have overwhelmed the students in their preparation. This aspect of nursing, by far, covers almost four out of seven professional subjects. Secondly, the posttest examination was difficult for the students. Student feedback about the examination reveals that the level of difficulty of the examination is beyond expectations. And lastly, the amount of time to review for the examination is too short. Hence, examination preparation is inadequate.

Table 2 Posttest grade after interactive discussion

Batch	Mean (x)	Standard Deviation (SD)	Interpretation
1	57.69	5.27	Needs Improvement
2	56.07	4.28	Needs Improvement
3	53.48	6.26	Needs Improvement
Total	56.29	5.51	Needs Improvement

Outcomes of Video Lesson

Table 3 presents the mean posttest grade of students after receiving a video lesson on medical and surgical nursing concepts. Students across batches exhibited passing scores in the examination with Batch 2 ($x_2 = 75.53$) gaining the highest posttest grades, followed by Batch 1 ($x_1 = 75.31$). Consistently, Batch 3 scored the lowest in the posttest ($x_3 = 73.04$). These results can be explained by a number of reasons. Since the video lesson was administered after the interactive discussion on medical and surgical nursing concepts, it served as a catalyst and facilitator of learning among students. It conforms with the current belief that video presentations are adjuncts that reinforce concept comprehension among learners. Furthermore, the results coincide with the researches of Mendoza and colleagues[11] (2015) as well as Mouneghi and colleagues[10] where students have improved knowledge acquisition after watching video lessons. Another reason for the improved scored of students is that the video lessons are more attractive, engaging and thought-provoking. The simultaneous narration and illustration of medical and surgical nursing concepts brought about a meaningful learning experience that reinforced understanding. These results follow the findings of Greenberg and Zanetis[7] where they stated that video lessons provide more avenues to better memory.

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Table 3 Posttest grade after video lesson

Batch	Mean (x)	Standard Deviation (SD)	Interpretation
1	75.31	6.78	Average
2	75.53	10.81	Average
3	73.04	10.63	Average
Total	74.84	8.90	Average

Association of Video Lesson and Interactive Discussion Outcomes

Table 4 describes the relationship of the posttest outcomes between video lesson and interactive discussion outcomes. It was revealed that there is a significant, weak positive relationship between the effects of video lesson and interactive discussion (r = 0.277, p = 0.003). Though the relationship between these two teaching methods is weak, this implies that video lesson and interactive discussion plays a complementary role in the development and reinforcement of medical and surgical nursing concepts to students. The findings of this paper correspond to the assertions of Greenberg and Zanetis[7] where in the videos does not only consolidate visual and auditory stimuli, but it also aids in integrating gaps in the artificial environment of the school and the outside world, bringing the reality into the classroom.

Table 4 Relationship between video lesson and interactive discussion outcomes

Pearson r value	p value	Decision
0.277	0.003	Reject H_0

Association of Teaching Modalities to Overall Outcomes

Table 5 illustrates the correlation coefficient of video lesson to overall outcomes and interactive discussion to overall outcomes. It can be seen that the outcomes of both video lesson (r = 0.327, p <0.01) and interactive discussion (r = 0.338, p <0.01) have significant contributions in reinforcing medical and surgical nursing concepts. This means that both teaching methodologies exert a considerable amount of learning on the part of the students. This combination of techniques is best fit to today's generation of learners, according to the study of Berk in 2009.[12] Moreover, the effects of video have influenced students by: (1) becoming more prepared in their studies, (2) being objective in their self-evaluation, (3) valuing video recordings as social models for future development, (4) applying knowledge when they do performance evaluations, and (5) foreseeing their future self in their chosen profession.[13–15] Truly, these finding bring sound proof on the role of videos in the reinforcing professional concepts among students.

Table 5 Relationship of video lesson and interactive discussion to overall outcomes

Variables	Pearson r value	p value	Decision
Video Lesson	0.327	<0.01	Reject H_0
Interactive Discussion	0.338	< 0.01	Reject H_0

Predictability of Video Lessons to Overall Outcomes

Table 6 shows the regression analysis of video lesson outcomes to overall outcomes. A simple linear regression was calculated to predict the overall outcomes based on video lessons outcome. A significant regression equation was found (F (1, 114) = 13.669, p < 0.01) with an R^2 of 0.107. The students predicted overall outcome is equal to 66.266 + 0.150 (video lesson outcomes) when video lesson outcomes are measured. Likewise, Figure 1 illustrates the least-squares regression line between results of video lessons and overall learning. This means that video lessons can have significant contribution in reinforcing learned concepts in medical and surgical nursing. It adds to the growing evidence that the utilization of video lessons is an integral approach in effecting and retaining learning.

Table 6 Linear regression between video lesson outcomes to overall outcomes

Variables	F	R^2	B	Sig.	Decision
Video Lesson	13.699	0.107	0.150	< 0.01	Reject H_0

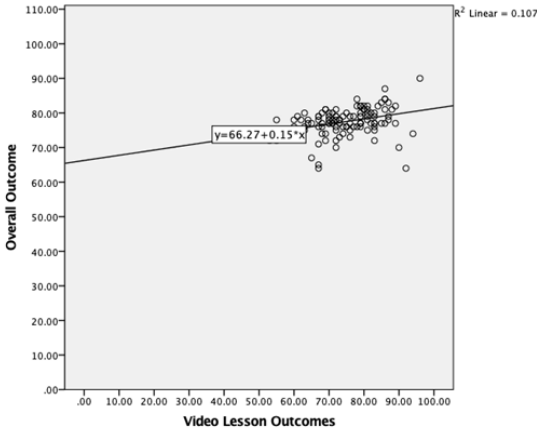

Figure 1 Least-squares regression line for video lesson outcomes to overall outcomes

Table 7 shows the results of one-way analysis of variance on the overall outcomes across batchers. It can be seen that there is no significant difference in the mean posttest grades of students for the past three years. This means that the process of implementing and evaluating video lessons and its outcomes has always been consistent; and that it demonstrates that video lessons consistently improves the way learners learn.[16]

Table 7 comparison of video lesson grades across batches

F	p value	Decision
0.723	0.488	Accept H_0

Conclusion and Recommendations

This quantitative research supports current trends in the use of video lessons to supplement traditional teaching methods. Findings of this research can serve as evidence to justify the integration of videos in the teaching and learning milieu. Because video combines several sources of information (images, motion, sounds, text) in a complementary fashion, learning can be adjusted more easily than with other tools to the diverse learning styles of students. It has also shown that the value of video is highly correlated to its integration within the curriculum and how it fits into the overall instructional sequence. Video does not just add emphasis, however. It organically fits in the learning milieu of the millennial students, a need felt not only by students who are growing up with rich digital technologies, but also increasingly by educators. That is why video should be considered as an important complimentary learning tool instead of a substitute.

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The latest expectation for video is that just as 21st century learners need to learn to be global citizens and to collaborate with others, learner-generated video will be a powerful tool in the hands of students. Besides the group collaborative work enabled by other forms of video, learner-generated video means an educator can ask students to demonstrate how they would solve problems or teach others. A common element of the 21st century skills movement is the practice of students creating multimedia content and delivering presentations to authentic (community stakeholders) audiences, and doing so throughout their education. Thus, learners must be taught to be wise consumers of multimedia and must also be given the skills necessary for creating it.

Finally, the accessibility and convenient use of video tools supports the changing role of the educator. Traditionally an in-person mentor, teachers will increasingly perform the mentoring role both in person and over distance, across geographies and time and across different media. This will serve as platform to change the global community into a universal multimodal classroom, giving learners, educators, and their institutions access to vast amounts of content worldwide.

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