3-6-2018

Using Student-Produced Video to Validate Head-to-Toe Assessment Performance

Christina Purpora
University of San Francisco, cmpurpora@usfca.edu

Susan K. Prion
University of San Francisco, prions@usfca.edu

Recommended Citation
Purpora, C., & Prion, S. (2018). Using Student-Produced Video to Validate Head-to-Toe Assessment Performance. Journal Of Nursing Education, 57(3), 154-158. doi:10.3928/01484834-20180221-05

Abstract

Background: This study explored third-semester baccalaureate nursing students' perception of the value of using student-produced video as an approach for learning head-to-toe assessment, an essential clinical nursing skill taught in the classroom.

Methods: A cognitive apprenticeship model guided the study. The researchers developed a 34-item survey. A convenience sample of 72 students enrolled in an applied assessment and nursing fundamentals course at a university in the western United States provided the data.

Results: Most students reported a videotaping process that worked, supportive faculty, valuable faculty review of their work, confidence, a sense of performance independence, the ability to identify normal assessment findings, and few barriers to learning.

Conclusion: The results suggest that a student-produced video approach to learning head-to-toe assessment was effective. Further, the study demonstrated how to leverage available instructional technology to provide meaningful, personalized instruction and feedback to students about an essential nursing skill.

Using Student-Produced Video to Validate Head-to-Toe Assessment Performance

Faculty in interprofessional healthcare education have used video as an effective teaching and learning strategy for years (Das & Allen, 2010; Hawkins, Osborne, Schofield, Pournaras, & Chester, 2012; Maloney, Storr, Morgan, & Ilic, 2013; Minardi & Ritter, 1999; Mort & Hansen, 2010; Shorten & Robertson, 1996; Tomlin, 2005; Winters, Hauck, Riggs, Clawson, & Collins, 2003). Not enough is known about how nursing students' perceive student-produced video (rather than faculty-produced) as a learning tool. The first author, faculty of record for an applied assessment and nursing fundamentals course, explored the use of student-produced video as a meaningful alternative to in–person faculty evaluation to validate 80 third-semester baccalaureate nursing students' classroom mastery of the head-to-toe assessment (HTT), an essential nursing skill.

Background

Research on the use of student-produced video as a teaching and learning strategy in nursing education is limited and dated. Nonetheless, these studies provide valuable insight into its advantages and disadvantages. Winters et al. (2003) concluded that when students worked in groups to create videos of essential skills, their learning and self-directed thinking were enhanced and they recognized their mistakes on video review. Students felt anxious with video review but to a lesser degree when compared to in-person faculty evaluation (Das & Alliex, 2003; Shorten & Robertson, 1996). When students' evaluated their performance, they retained the clinical skills that they videotaped and felt satisfied with the learning experience when compared to a control group (Yoo, Son, Kim, & Park, 2009).

Students also reported disadvantages. They regarded as excessive the time needed to coordinate with classmates for practice and videotaping, and reported the real and presumed

technical issues with equipment (Shorten & Robertson, 1996; Winters et al., 2003). The limited availability of equipment, laboratory time, and a faculty resource were concerns too (Winters et al., 2003). Students' perceived as a drawback the added time it took to learn how to use the equipment in addition to the time needed to learn a new nursing skill (Winters et al., 2003).

The first author drew teaching strategies from the successes and drawbacks reported in existing studies and added others to develop an approach to the HTT assessment video assignment plan. From the successes, students worked in self-selected triads, rotating roles of nurse, patient, and videographer (Shorten & Robertson, 1996; Winters et al., 2003). Once a student had videotaped his or her HTT, he or she could review, erase, reshoot, and ultimately submit the video to the faculty when they were satisfied with it (Shorten & Robertson, 1996). Each student received a rubric to self-grade his or her performance (Yoo et al., 2009). Once graded, each student met with the first author to review his or her video and get personalized feedback on his or her performance (Shorten & Robertson, 1996).

From the drawbacks, the students practiced with the cameras before officially using them, the skills lab availability was assured, and a faculty resource was available when videotaping (Winters et al., 2003). The faculty added preparatory materials for the students and an edict to individualize the HTT sequence so that it made sense to them. As part of the self-grading, the faculty instructed the students to write a reflection on their HTT performance to include what they did well, what areas needed growth, and a plan to improve on the areas identified as unsatisfactory (Milan, 2003).

This study's purpose was to explore third-semester baccalaureate nursing students' perception of the value of using student-produced video as an approach for learning HTT assessment, an essential clinical nursing skill taught in the classroom.

Framework

Collins, Brown, and Newman's (1987) Cognitive Apprenticeship Model guided the study. Its premise is that while classroom teaching is effective, the ideas and skills taught there are disconnected from where they will be used. The model proposes four elements - *content, method, sequencing,* and *sociology* – to create an effective learning environment, one that places students in the intended setting to learn to function there. First, the content element includes *tricks of the trade,* use of repetition to master skills, c*ontrol strategies,* alternate approaches to problem-solving, and *learning strategies,* the ability to know how to learn. Second, the method element defines teaching techniques that foster exploration and independence. Teaching techniques include *modeling* – skill demonstration, *coaching* – provide tips and feedback, and *scaffolding* – provide preparatory materials to students. The teacher encourages students to *articulate,* to express thoughts and problem-solving abilities, and *reflect,* to critique their work to improve thinking. To help foster learner independence, the teacher promotes *exploration*, setting goals for the student. Third, the sequencing element allows the student to acquire various skills that build complex skills on the basic skills learned first. The fourth element, sociology, refers to a learning environment that mirrors the character of the setting where the skills will be used.

This model was a good guide for this nursing education study because it aligns with the importance of creating an effective learning environment to connect classroom learning of HTT assessment with application to clinical practice.

Methods

Design

The design was cross-sectional. A convenience sample of third-semester baccalaureate students enrolled in spring 2015 in an applied assessment and nursing fundamentals course at a

well-established university nursing school in the Western United States participated. The university's human subjects committee approved the study.

HTT Assessment Video Assignment

A month before the assignment was due, the students received written expectations for the videotaping process and a head-to-toe study guide. On videotaping day, they arrived at the skills lab, obtained a camera from the faculty, and proceeded to a cubicle with their self-selected triad to tape individual videos which could not be more than 15 minutes in length. Prompts of any kind, such as the study guide, were not permitted in the cubicle. When each student was satisfied with his or her videotaped HTT performance, he or she kept a copy of his or her video, submitted a copy of it to the faculty, and received a rubric for self-grading and reflection on his or her video performance. Each student brought his or her self-graded rubric and written reflection to a 30 minute, one-to-one review with the first author.

Measure

The researchers developed the study's 34-item survey in two phases, focus groups and survey development using an iterative, descriptive content analysis process. The survey used Likert-like item responses with 4 = strongly agree, 3 = agree, 2 = disagree, and 1 = strongly disagree. Because each student completed the HTT assessment video assignment, "not applicable" was not offered as a response item.

Data Collection

In the absence of the first author, the second author briefed the students during the last 10 minutes of the class period. Each student received a one-page handout detailing the study's purpose, the planned use of results, and the voluntary and confidential nature of their participation. The handout also included an assurance that participation or non-participation would have no impact on their course grade and the contact information for the second author.

Interested students were asked to complete the 34-question survey without including any identifying information. They were encouraged to ask questions before filling out the survey and informed that submission of the completed survey constituted consent to participate.

Results

Out of the 80 students enrolled, 72 participated in the survey, a 90% response rate. For data analysis, the researchers used the Statistical Package for the Social Sciences (SPSS) version 22.0 for Windows (2013, IBM Corp., Armonk, NY, USA). They performed an exploratory factor analysis on the newly developed measure. Table 1 (see Appendix A) displays the mean, standard deviation, and Cronbach's Alpha for each of the four subgroupings produced. Further, the researchers calculated the percent frequency and mean for the individual items in each of the four subgroupings (see Table 2, Appendix B).

Exploratory Factor Analysis

The researchers emphasize the exploratory nature of the factor analysis. There is disagreement among scholars about what constitutes a sample size adequate for factor analysis (Hair, Black, Babin, & Anderson, 2010; Nunnally & Bernstein; 1994; Tabachnick & Fidell, 2007). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy on this study's data was .673. A sample size is considered adequate when the value is .6 or more (Kaiser & Rice, 1974; Pallant, 2010). Factors were identified based on loadings of above .5 (Nunnally & Bernstein, 1994) and interpretability. Of the 34 original items, a total of 23 items loaded on one of the four factors. All factors correlated positively with each other with correlations ranging from 0.21 to 0.49. Researchers use face validity to decide the degree to which the items in a scale relate to a construct (Hair et al., 2010). In this study, the researchers used face validity to make sense of the item loadings on each factor in terms of learning.

Factor 1: Process and Outcome. This subgrouping included 10 items (Table 2). Its Cronbach's Alpha was strong, .89 (Table 1). The responses that the students chose most frequently averaged somewhere between agree and strongly agree for each of the items (Table 2). Conceptually, their responses suggest that the videotaping process worked and the outcome was productive in that they were able to identify normal assessment findings in the healthy adult, what they performed well, what they wanted to improve upon, and a plan to improve.

Factor 2: Feedback and Review. This subgrouping included 5 items (Table 2). Its Cronbach's Alpha was strong, .91 (Table 1). The responses that the students chose most frequently averaged somewhere between agree and strongly agree for each of the items (Table 2). Conceptually, their responses suggest that the one-to-one feedback and review with faculty was worthwhile.

Factor 3: Support and Confidence. This subgrouping included 4 items (Table 2). Its Cronbach's Alpha was strong, .80 (Table 1). The responses that the students' chose most frequently averaged somewhere between agree and strongly agree for each of the items (Table 2). Conceptually, their responses suggest that they felt that their clinical faculty supported their learning of the HTT and they felt confident and a sense of independence to perform the HTT competently.

Factor 4: Barriers to Learning. This subgrouping included 4 items (Table 2). Its Cronbach's Alpha was acceptable, .77 (Table 1). The responses that the students' chose most frequently averaged somewhere between disagree and strongly disagree for each of the items (Table 2). Conceptually, their responses suggest that they experienced few barriers to learning.

Discussion

This study's findings suggest that participating third-semester baccalaureate nursing students' perceived student-produced video as a valuable and meaningful approach to learning

the HTT assessment, and a worthwhile learning experience overall. Their perceptions may be grounded in the process used to accomplish the student-produced video assignment; the support and feedback they received from their didactic course and clinical faculties; the minimal barriers to learning reported; and their sense of confidence and independence to perform the HTT assessment.

The results also suggest that the learning environment created was effective. The videotape HTT assignment was designed from teaching strategies from the work of previous researchers with new ones that the current researchers added (Milan, 2003; Shorten & Robertson, 1996; Winters et al., 2003; Yoo et al., 2009). To create an effective learning environment where students could connect classroom learning with clinical application, the four elements from Collins et al.'s (1987) Cognitive Apprenticeship Model-content, method, sequencing, and sociology-framed the strategies.

Regarding teaching strategies framed in the element of content, the students reshot their videos to master the HTT through repetition, a trick of the trade. Given the parts to include in the HTT, the students successfully put it together in a sequence that made sense to them, a control strategy. Learning strategies were self-grading and feedback from faculty during a one-to-one meeting.

For the method element, the first author demonstrated the HTT in class (modeling) and provided preparatory materials, a HTT demonstration video and study guide and, confirmation that the skills lab and cameras were available for practice (scaffolding). The written faculty expectations for videotaping set goals (exploration). During the individual review with the first author, each student received tips for success (coaching). At the same time, they were asked to

articulate and reflect on their performance, identify skills done well and areas for improvement, and develop a plan to perfect and maintain their skills.

The performance of an entire HTT assessment is complex compared to the basic, separate performance of system parts. The student learned the basic, individual system assessments (i.e. heart, skin) first, then together the whole, complex HTT assessment, a strategy framed with the element of sequencing. The element of sociology used a strategy that situated students in the skills lab to practice their HTT and to videotape it in an environment meant to mirror the clinical setting.

Limitations

The project limitations included convenience sampling, sample size, preliminary reliability and face validity of the survey subgroupings, and possible social desirability bias.

Conclusion

The study added knowledge about the student-produced video approach to learning HTT assessment. Third-semester nursing students felt able to apply classroom learning of this skill to clinical practice, and the process encouraged the development of their self-reflection skills. A cognitive apprenticeship model provided a framework for creating this valuable learning experience. The study also leveraged available instructional technology to provide meaningful, personalized instruction and feedback to beginning nursing students about an essential and foundational skill. Though time-intensive for the faculty member, the one-to-one meetings with each student supported the socialization of the future nurse with helpful feedback habits and gave him or her a direct exemplar for essential professional behaviors. The instructional implications of student-produced video are significant and widespread for healthcare educators, and additional research should be conducted to explore further the opportunities and possibilities of this pedagogical strategy.

References

Collins, A., Brown, J.S., & Newman, S. E. (1987). Cognitive apprenticeship: Teaching the craft of reading, writing, and mathematics. Technical Report No. 403. Retrieved from https://www.ideals.illinois.edu/bitstream/handle/2142/17958/ctrstreadtechrepv01987i00403_opt.pdf?sequence

Das, A., & Alliex, S. (2010). Perceptions of using video as an assessment tool. *Australian Nursing Journal, 17*(7), 35.

Hair, J.F., Black, W. C., Babin, B.J., & Anderson, R.E. (2010). *Multivariate data analysis.* (7th ed.). Upper Saddle Brook River, NJ: Pearson.

Hawkins, S.C., Osborne, A., Schofield, S.J., Pournaras, D.J., & Chester, J.F. (2012). Improving the accuracy of self-assessment of practical clinical skills using video feedback: The importance of including benchmarks. *Medical Teacher, 34,* 279-284.

Kaiser, H. F., & Rice, J. (1974). Little jiffy, mark IV. *Educational and Psychological Measurement, 34,* 111-117.

Maloney, S., Storr, M., Morgan, P., & Ilic, D. (2013). The effect of student self-video f performance on clinical skill competency: A randomized controlled trial. *Advances in Health Science Education, 18,* 81-89.

Milan, F. (2003). What's new in feedback in medical education: Life beyond the feedback sandwich. *Handout SGIM 26th Annual Meeting.* Retrieved from http://impak.sgim.org/userfiles/file/AMHandouts/AM03Handouts/WE12.pdf

Minardi, H., & Ritter, S. (1999). Recording skills practice on videotape can enhance learning: A comparative study between nurse lecturers and nursing students. *Journal of Advanced Nursing, 29*(6), 1318-1325

Mort, J. R., & Hansen, D. J. (2010). First-year Pharmacy Students' Self-Assessment of Communication Skills and the Impact of Video Review. *American Journal of Pharmaceutical Education, 74*(5), 78.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.

Pallant, J. (2010). *SPSS survival manual*. (4th. Ed). Berkshire, England: McGraw-Hill.

Shorten, A., & Robertson, L. (1996). The video assessment strategy: Improving student learning and reducing stress. *Nurse Educator, 21*(5), 8.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson Education.

Tomlin, G. (2005). The use of interactive video client simulation scores to predict clinical performance of occupational therapy students. *The American Journal of Occupational Therapy Students, 59*(1), 50-56.

Winters, J., Hauck, B., Riggs, J., Clawson, J., & Collins, J. (2003). Use of videotaping to assess competencies and course outcomes. *Journal of Nursing Education, 42*(10), 472-476.

Yoo, M.S., Son, Y. J., Kim, Y.S., & Park, J.H. (2009). Video-based self-assessment: Implementation and evaluation in an undergraduate nursing course. *Nursing Education Today, 29*, 585-589.

Appendix A: Table 1

Table 1

Factors 1-4 with Scale Statistics

Factor	n	mean	sd	Cronbach's Alpha
1	68	35.57	3.98	.89
2	71	18.03	6.54	.91
3	71	13.07	2.50	.80
4	72	7.53	2.66	.77

Appendix B: Table 2

Table 2

Factor (F) Number (1-4) with Corresponding Items and Item Statistics

Factor	Item		MFR	%	Mean
1	8	I can identify normal assessment findings for a healthy adult.	4	63.9	3.7
	9	Learning the individual parts helped me put together the entire HTT.	4	65.3	3.7
	17	I can now identify assessment skills that I do well.	4	54.2	3.6
	18	I can identify assessment skills that I need to continue to practice and improve.	4	59.7	3.6
	19	I have a plan for how to maintain and improve my assessment skill.	4	51.4	3.5
	21	I knew how to operate the video camera successfully.	4	63.9	3.7
	24	The Skills Lab was convenient for me to practice.	3	37.5	3.2
	26	My group members worked well together.	4	69.4	3.7
	30	Interaction among my group were respectful.	4	72.2	3.7
	31	All of the students in my group were prepared to shoot their assessment videos.	4	44.4	3.4
2	1	The experience made me feel like a real nurse.	3	50.0	3.3
	11	The one-one-one review with my instructor was valuable.	4	80.6	3.8
	14	The time allotted for the one-to-one review was adequate.	4	62.5	3.6
	16	Viewing the video-tape with my instructor was a meaningful experience.	4	70.8	3.6
	34	Overall, this was a worthwhile learning experience for me.	4	72.2	3.7
3	3	I can perform my HTT assessment independently.	4	52.8	3.5
	4	I can perform a HTT assessment with confidence and competence.	3	54.2	3.3
	6	My clinical instructor reinforced this content during clinical.	4	45.8	3.2
	7	My clinical instructor helped me find opportunities to practice my assessment skills.	4	41.7	3.1
4	22	The videotaping process was frustrating and difficult.	1	48.6	1.7
	27	It was difficult to find a mutually convenient time for my group to practice our individual assessments.	2	37.5	2.2
	29	I felt rushed for time during my videotaping.	2	51.4	1.9
	33	My group experienced conflicts that were not adequately resolved.	1	51.4	1.7

Note: Most frequent response (MFR), 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree; %=Frequency percent.