Nursing Competency: Mobile Device Use in the Rural Setting

Application of Innovation Assignment: Nursing Informatics

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ABSTRACT

Simulation training can improve nursing staff confidence, competence, and communication in new and unfamiliar situations. The development of unique and creative handheld information technology solutions to enhance nursing knowledge in the clinical setting is gaining attention and momentum. Access to clinical educational opportunities is reduced within the healthcare environment in rural communities due to limited educator resource availability. Mobile device applications developed for use by nurses practicing in rural communities can stimulate and impart knowledge, skills, and confidence as critical-thinking skills are advanced. Traditional nursing education and competency enhancement takes place “in seat”. Mobile device applications provide education conducted outside the classroom and into the live environment of care. The self-paced mobile device platform allows learners to work outside of the classroom and at the bedside or in the clinical environment. The curriculum is focused on improving interaction between preceptors and nurses while establishing deeper levels of demonstrated competency and improving safe, quality patient care outcomes. This paper discusses the creation of a standardized, interactive nursing education and simulation training with the ability to generate an immersive, collaborative learning encounter for preceptor/educator and nurses on the mobile device platform.

Keywords: nursing, simulation, mobile device, competency, education
INTRODUCTION

Simulation training can improve nursing staff confidence, competence, and communication in new and unfamiliar situations. Mobile device, personal digital assistant (PDA) or computer tablet technology that is embedded within the clinical environment has the opportunity to prevent errors by augmenting experiences through simulation (Day-Black & Merrill, 2015). Applications developed for use via mobile devices can stimulate and impart knowledge, skills, and confidence as critical-thinking skills are developed by nurses practicing in rural communities. The development of unique and creative handheld information technology solutions to enhance nursing knowledge in the clinical setting is gaining attention and momentum.

Access to clinical educational opportunities is reduced within the healthcare environment in rural communities due to limited educator resource availability. Knowledge and experience enhancement is especially challenging in a rural community setting (Ostini & Bonner, 2012). The objective of the application of innovation assignment is the creation of standardized, interactive nursing education and simulation training with the ability to generate an immersive, collaborative learning encounter for preceptor and nurses on the mobile device platform.
BACKGROUND
Required System Improvements

Clinical experience education, including orientation, is currently provided in a central location. Didactic classroom followed by simulation lab sessions that adhere to scenario-based outcome objectives provide safe realistic opportunities to learn in a non-threatening environment. Nurses are consistently challenged to critically think while providing patient care in a dynamic healthcare environment (Day-Black & Merrill, 2015). Nurses must deal with complex problems with varying levels of competency and experience in a rural healthcare setting (Forfa, 2013). Opportunities for involvement in diverse clinical experiences is challenging in the rural setting with transition from classroom to actual practice (Ostini & Bonner, 2012). Evidence-based knowledge application enhanced by self-directed learning is essential in the transforming healthcare environment (Forfa, 2013). Schlairet (2012) described the use of PDAs as beneficial to “prompt reflection and trigger important need-learning experiences”.

ESTABLISHING MOBILE DEVICE IMPROVEMENTS
Quality Improvement Framework Method

The system identified to be improved is simulation education in the rural healthcare setting. The evidenced based methodology chosen for problem-solving is Plan-Do-Study-Act (PDSA) for quality improvement (QI) by studying the results of the implemented process change and refining to achieve and sustain results (Strom, 2013). The initial step is to identify and recruit diverse nursing team members with varying knowledge and experience. Examples of the QI team membership includes direct care nurses (experienced and new graduate), educator, advanced practice nurse, preceptor, and departmental leadership (charge nurse or manager), performance improvement (PI) staff and
information technology analyst. Dwayne Spradin, president and CEO of InnoCentive, advocates for soliciting good problem solvers (discriminators, observers and inquisitors, decomposers and integrators, ideators and synthesizers, pruners and risk-takers, workers and delegators, communicators and presenters); those who “find great pleasure in solving problems no one else has solved” (Hayhurst, 2013). A team leader/facilitator is identified.

- **Plan:** Current process and clinical knowledge is clarified with questionnaires completed to obtain the voice of the customer (VOC). Process mapping is used to ascertain scope, boundaries, step sequence, and process flow (Schwartz, Landis, & John, 1999). Equipment is chosen and evaluated for ease of use. Clinical application interactive scenario simulations are ranked and prioritized for development. Goals and outcomes are created along with performance measurements. The application design should motivate the learner based on Attention, Relevance, Confidence, and Satisfaction (ARCS) while promoting knowledge (Pange & Pange, 2011). The content should be concise, accurate, thorough, and effective for mobile device use. A balance of text, audio, graphics, and video should be considered (Pange & Pange, 2011). Content should begin with course overview and objectives, progressing systematically through knowledge enhancing content that ends with a summary, and concluding with scenario testing and evaluation. The expected outcome of interactive mobile device simulation is a learner motivated to apply, analyze, compose and evaluate new information with progression to real-life clinical application (Pange & Pange, 2011).

- **Do:** Individual competency is evaluated at the end of the application through scenario based knowledge and critical thinking scenario completion. Simulation scenarios for use with mobile devices are created that include evidence-based practice knowledge, interactive clinical practice actions that evaluate critical-thinking, and post-application
evaluation by end-user. The outcomes and clinical use are discussed with the preceptor (debriefing) after the mobile device application learning is completed. Achievements and deficiencies are recognized and evaluated under the supervision of the preceptor (Forfa, 2013). Appliance to actual clinical situation is discussed and planned for the preceptor or other experienced nurse to be attendance for actual hands-on patient experience augmentation.

- **Study:** Review is required that ascertains whether the knowledge deficits can be appropriately addressed with the provided curriculum within the application. Assess completion of mobile device simulation scenario learning, debriefing sessions with preceptors, and actual performance with patients. Performance gaps are immediately mitigated. Allow sufficient time for the process to be implemented and tested. Complete data review and result comparison with goals. Observe and modify the QI/PI and modify as necessary (OSF HealthCare, 2012).

- **Act:** Determine if revision or further if refinement cycles are required based on outcome data management. Automatic evaluation of ambiguous information can be flagged by the learner within embedded software for evaluation by the preceptor/educator with changes made even as learner progresses within the course material.

**Organizational Readiness, Strengths and Barriers**

The completion of a QI/PI change as an integrated approach within a “Just Culture” environment that acknowledges that behaviors of “human error (unintentional mistakes), risky behaviors (workarounds), and reckless behaviors (total disregard for established policies and procedures) can be highly successful (McGonigle & Mastrian, 2015). Change management is augmented by review of mobile device education simulation with end-users; clearly communicating the
burning platform to ensure a safe learning environment and enhance quality patient outcomes.

Readily available and accessible PDA or tablet mobile devices are a necessary requirement. A strength is that current use of electronic medical record documentation system that spans across the continuum has provided acceptance of the benefits of informatics tools and resources through positive interactions and perceptions. An identified barrier is that end-user preference of PDA (compact and portable) or tablet (easier to visualize) may create a financial burden in ensuring the right number of mobile devices per individual preference. Preceptors must be educated to comprehensively support mobile device simulation application use by controlling pace, learning cues, and providing Additional individual learning and reflection opportunities (Schlairet, 2012). Information and stimulus overload must be prevented by preceptor situational awareness. Preceptors and educators remain essential in creating positive learning situations in a dynamic ever-changing healthcare environment (Sandau & Halm, 2010). It must be cautioned to avoid decreasing healthcare costs by reliance on mobile device learning in place of preceptors.

Information technology (IT) and educational resources are challenged with competing priorities and increasing volume of requests for enhancements. Limiting factors of allocation of IT and education resources could delay program development and expansion. Executive endorsement of the QI/PI mobile device improvement plan with resource allocation for continued use is critical for successful project funding.

**Outcome Data Management**

Outcome measurements are created based on individual clinical simulation and scenario curriculum development. Examples of applications to be installed on mobile devices include: IV insertion, IV smart pumps, medication administration
(Heparin and Pitocin infusions), medication safety, urinary catheter insertion, cardiac monitoring, fetal monitoring, and APGAR scoring. These software applications are linked for result scoring storage and completion monitoring. Overall goals for maximum use of mobile devices, improvements in clinical nurse best practice competency, and patient outcomes are identified and measured.

Evaluations of mobile device education and debriefings with preceptors are completed and evaluated for effectiveness and improvements. Follow-up clinical application with actual patient experience is evaluated. Quarterly and annual evaluation of learners, preceptors, and mobile device application are completed. Secure software is created to electronically track and provide analysis along with data mining capabilities (McGonigle & Mastrian, 2015). Key performance indicators are translated into a customized dashboard to demonstrate clinical competencies.

Expansion of education availability for the mobile device platform is evaluated and prioritized for creation. The overall mobile device technology simulation package should be evaluated for “teaching strategies and content delivery, time and pace management, interface design, and preservation of learners’ focus” (Pange & Pange, 2011). Assessment of preceptor and educator expert modeling that contributes to learning through actual clinical patient competency performance provides evaluation for enriched preceptor and educator preparation.

**MOBILE DEVICE IMPROVEMENT IMPLEMENTATION**

**Endorsement**

Nurse Practice Council (NPC) endorsement of the mobile device platform use to enhance nurse competency is a critical element for successful implementation. The NPC participation in ensuring that nurses understand the educational goals
and benefits of the mobile device application based simulation program is essential (Pange & Pange, 2011). Personalization based on individual assessed learning needs is a positive perspective for acceptance. Senior leadership and nursing shared governance endorsement and support is critical for successful implementation and ongoing program sustainment. Barriers encountered must be recognized and removed efficiently and effectively to sustain positive momentum.

Policy Efforts

The Tiger (Technology Informatics Guiding Education Reform) Initiative focuses attention and action on using “informatics tools, principles, theories, and practices to enable nurses to make healthcare safer, more effective, efficient, patient-centered, timely, and equitable” (HIMSS, 2016). The use of informatics tools that can be integrated into day-to-day clinical practice is endorsed extensively by healthcare professional groups. The development of mobile device informatics tools to enhance education access and nurse competency is an innovative solution to promote learning outside the classroom and into the clinical environment. Nursing’s influential involvement in the creating healthcare information technology system feature and function solutions is essential for safe quality patient care (Murphy, 2010).

CONCLUSION

Rural community nurse competency improvement can be effectively and economically enhanced with development and implementation of e-learning environments (Forfa, 2013). PDAs or tablets are a vital informatics technology resource that promotes healthcare learning and enhances the provision of safe patient care (Day-Black & Merrill, 2015). Mobile device adoption by nurses is
rapidly evolving with transformational use in the clinical setting (McGonigle & Mastrian, 2015). Learning and knowledge transfer enhanced by technology provides the opportunity for maximum benefit in the clinical environment (Harden, 2005).

The self-paced mobile device platform allows learners to work outside of the classroom and at the bedside or in the clinical environment. Traditional nursing education and competency enhancement takes place “in seat”. Mobile device applications provide education conducted on PDAs or tablets outside the classroom and into the live environment of care. The curriculum is focused on improving interaction between preceptors and nurses while establishing deeper levels of demonstrated competency by facilitating a common language and understanding between nurses.

Boston-Fleischhauer, Brierley, Virkstis, Young, Stewart, and Berkow (2016) challenge nursing leaders to embrace disruptive innovation and create the space to innovate in the transforming healthcare environment by taking calculated, not careless risks. Empowering nurses to commit to experimentation with mobile device simulation applications that enhance competency creates an innovative environment that stimulates the expansion of performance improvement resulting in safe, high-quality patient outcomes. The implementation of a standardized, interactive nursing education and simulation training on a mobile device platform produces a collaborative learning encounter that is not readily available in the rural healthcare environment.
REFERENCES


