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Government Support for Simulations in  
Nursing Education in Rural Areas

Barbara J. Matthees, PhD, RN

Minnesota State University Moorhead  
Moorhead, MN

## Government Support for Simulations in Nursing Education in Rural Areas

This paper will examine governmental sources of funding supporting the use of simulation in nursing education in rural areas. A variety of funding streams and policy issues are considered to determine potential redirection of funds toward simulation in nursing education.

### Background: Nursing shortage and clinical simulation

The nursing shortage nationwide is growing and will continue to expand if present trends in demographics and nursing education continue. The American Association of Colleges of Nursing (AACN, 2007) estimates that one million nursing positions will be open by 2010 and over 30% of these, 390,000, will be at the baccalaureate or master's level. There are multiple reasons cited for this shortage, including (but not limited to):

- An aging workforce that is not being replaced at the pace of retirements
- Deteriorating working conditions leading to burnout and job dissatisfaction
- Bottleneck in higher education, limiting the numbers of new nursing graduates being produced. (AACN, 2005).

Currently, higher education needs to be producing more nurses and there are increasing numbers of students seeking admission to nursing education programs. However, large numbers of qualified applicants are being turned away from nursing education (AACN, 2005). Two critical shortages are exacerbating this problem. First, nursing educators are in very short supply and, at an average age of 55 years, will begin to retire in large numbers (AACN, 2007). Incoming numbers of nursing educators at either the Master's or Doctoral levels are limited.

Secondly, clinical placement sites for nursing students are extremely limited, yet essential, in preparing safe practitioners. The availability of clinical placements will affect a program's ability to expand. Patients are more acutely ill and, yet, are hospitalized a shorter time than in the past. With

the growing number of health professions that need clinical experiences, nursing may find it necessary to share clinical spots with students in medicine, respiratory therapy, social work, graduate programs of all kinds, and other nursing schools. Clinical experiences can be inconsistent between students and over time. That is, student clinical experiences cannot be orchestrated to assure that every student has every desirable clinical experience. In a small rural hospital there are periods of time with very few patients. Pediatric and obstetric experiences may not even be an option for students in a rural community without driving to a larger hospital/medical center.

### *Simulation and Nursing Education*

Nursing education is actively pursuing innovations (NLN, 2003), including addressing the issue of limited access to appropriate clinical experiences. One of the measures being enthusiastically pursued nationally is the use of simulated clinical experiences. Simulations are being incorporated by nursing and staff education programs throughout the U.S. and abroad, in urban and rural environments, small and large schools and institutions.

Simulations mirror real situations and include a broad spectrum of educational modalities from the most basic case studies to the highly technical high fidelity team training experiences. (See Appendix A). In respect to health care, simulation attempts “to replicate some or nearly all of the essential aspects of a clinical situation so that the situation may be more readily understood and managed when it occurs for real in clinical practice” (Morton, 1995 as cited in Jeffries, 2007, p. 3). Simulations allow for safe rehearsal of high risk, low frequency situations as well as for high frequency procedures in a very safe setting with immediate feedback. The airline industry has trained pilots on flight simulators and crew training has been done to assure effective teamwork for many years. In nursing and medicine, there is an increasing body of literature addressing the effectiveness of simulation training in health care.

Simulations at all levels of sophistication provide students and practitioners the opportunity for supervised instruction and practice in an environment that is ‘error-forgiving’ and allows practice with no opportunity to injure a patient. Scenarios must be tailored to participants’ current educational needs to be most effective. Faculty or supervisors work with the student/practitioner and debrief the simulation to effectively improve practice and patient care. This is done in a situation of absolute patient safety (no ‘live’ patients are involved). Video recordings of the simulation provide the student, team and instructor the opportunity to analyze individual actions and team interactions that enhanced or limited their effectiveness.

The National League for Nursing (NLN) (Jeffries, 2007) recently reported the results of a multi-site, multi-method study using simulations to teach nursing care (Designing and Implementing Models for the Innovative Use of Simulation to Teach Nursing Care of Ill Adults and Children: A National, Multi-Site, Multi-Method study, see Appendix B). The three year study evaluated several outcomes of three types of simulation: paper and pencil case studies, static mannequins and high fidelity patient simulators. Each of the simulation methods were found effective in some areas and further research is necessary to continue evaluation of learning outcomes and ultimate impact upon patient care. In April of 2007 the NLN announced a new project to create a virtual Simulation Innovation and Resource Center (SIRC), again in conjunction with Laerdal.

#### *Regulatory Position on Simulation*

Questions are raised about the use of ‘simulated’ clinical experiences in lieu of ‘live’ clinical experiences for students. Some state boards of nursing prescribe the number of ‘clinical’ hours a student must complete as part of their educational process. Others set outcome measures without being proscriptive about the strategies used. The National Council of State Boards of Nursing (NCSBN) advises its member state boards of nursing in their missions of protecting the public by

ensuring that nursing is practiced by minimally competent, licensed nurses within their authorized scope of practice. In 2005, the NCSBN examined clinical instruction in prelicensure programs and recommended that “nursing education programs shall include clinical experiences with actual patients; they might also include innovative teaching strategies that complement clinical experiences” (NCSBN, 2005, p. 1). The conclusions included use of simulation as a complement to authentic clinical experience with patients, and not a substitute for it.

### Rural Healthcare and Funding Options

Rural health care has distinct challenges and issues, in addition to those experienced nationwide. The term ‘rural’ is broad and defined and applied differently by various federal agencies and organizations. The rural population is changing due to commuting patterns and as suburban/urban areas grow into the ‘rural’ areas. With any definition, rural healthcare faces multiple challenges. The health workforce shortages are exacerbated in rural areas. Funding sources that are dependent upon legislative priorities can be unstable as national, state and local priorities shift.

#### *Rural Health Issues*

Health care in rural areas is impacted by the presence of an older, often poorer population than their urban neighbors. Many small rural hospitals have closed and others may be in financial difficulties (see footnote 1). Almost all health care units, including hospitals, clinics, public health and education have difficulty finding and keeping primary care practitioners as well as nurses and ancillary health staff (Rural Assistance Center, 2007). The distances between providers, and between provider and patient, are significant and often become a barrier to access of health care in addition to increasing the cost of care.

Additionally, rural hospitals and communities have the need for continuing education of professionals (i.e. MDs, RNs) and community care providers (firefighters, police, emergency personnel) in as cost effective a manner as possible, to preserve valuable financial and personnel resources. Distance and limited resources create challenges to establishing and maintaining the necessary level of expertise in these key providers. Collaboration with other rural communities to accomplish this can keep the costs reasonable.

Rural communities have the same concerns as their urban counterparts regarding assuring safe patient care as the patient acuity and age rise. Additionally, rural nursing education has more limited access to clinical experiences and needs to focus on collaboration with other programs, communities and providers.

One strategy that is being used to reduce the geographic distances between providers and patients is technology, specifically telehealth systems (Health Resources and Services Administration, 2006). Rural care providers and patients can receive real-time consultation with specialists via telehealth. The specialist in the larger health care setting works with the local care provider to diagnose and treat illnesses that require the specialist's knowledge and skills. The patient (or specialist) is spared the expense and difficulty of travel, which might have made care by the specialist unrealistic.

#### *Federal Funding Initiatives*

Some innovative programs have been instituted by the federal government to support health care, and that have implications in the use of nursing education simulations in rural areas.

- The US Department of Agriculture Rural Development has granted distance learning and telemedicine program awards that totaled almost \$26 million in 2006 “to provide improved educational and medical services to residents of 38 states.” (Access at:

<http://www.usda.gov/rus/telecom/dlt/dlt.htm>) These awards included support for direct patient care, mental health support, initiating or expanding services such as telemedicine, telepharmacy, teleradiology and more. Additionally, K-12 education was funded as it used distance technology to provide education to very rural students. Additional funds are available for 2007.

- Homeland Security has directed rural communities toward a number of health related grant programs including the Rural Health Network Development grants, Delta States Rural Development network, and the Assistance to Firefighters Grant (AFG) Program which includes funding for training, safety projects and more (Philpott, 2006).
  - One nursing education program has utilized funds from homeland security to support simulations in the area of bioterrorism and disaster training for healthcare providers (Personal communication, D. Molinari, Feb. 2007). The Idaho virtual hospital & community has been developed and utilized for bioterrorism and pandemic drills and provider education and practice in collaboration—prior to the ‘real event’. Simulations classroom and distance education tools are all utilized.  
(Access at: <http://www.isu.edu/irh/IBAPP/simulations.shtml>),
- Within the Health Research and Services Agency’s (HRSA) Office of Rural Health Policy (ORHP), the Rural Health Care Services Outreach Grant Program encourages the development of new and innovative health care delivery systems in rural communities that lack essential health care services. (Access at: <http://ruralhealth.hrsa.gov/funding/outreach.htm> ) Through consortia and collaborations of rural providers, educators, emergency care providers, churches, private providers and more, rural communities have managed to provide health care services to meet local needs. For 2007-2009 grants of \$3,750,000 included 25 new grantees over 3 years.

The ORHP has found, historically, that current federal policies and programs “are not sufficiently flexible to meet the unique and diverse needs of rural populations. Subsequently, rural residents are often unable to benefit from available resources and services.” The Rural Health Care Services Outreach Grant Program is one program that allows communities more flexibility in receiving federal funds. Grantees are required to address the sustainability of their plans, after federal funds end and to improve health care services through coordination and collaboration between providers. These concerns and needs are mirrored in rural nursing education programs.

### *State Funding Initiatives*

State funding of rural health care, nursing education and use of simulation varies greatly. States may choose to appropriate funds through legislative action. They may channel federal funds to the identified programs with or without additional state funds. They may creatively redirect federal funds into new and creative programs within the state.

- Ideally, states administer federal funding in directions appropriate for that state’s needs. For example, in Minnesota, the USDA Rural Development has provided almost \$3.5 billion throughout the state since 2001 for economic development and rural infrastructure needs. In 2006, major funding and loans for expansion were provided to the NorthWest Mental Health Center in Crookston, MN. (available at: <http://www.rurdev.usda.gov/mn/>)
- States may fund telehealth practice. For example, schools are mandated to service all children with disabilities through the Individuals with Disabilities Education Act (IDEA). Although states receive federal funds to do this, provider shortages in the rural areas have lead schools to be quite creative. In Oklahoma, a speech telepractice brings speech therapy to rural students through connections between therapists at the clinics and the schools. (Forducey, 2006).

### Simulation Issues and Funding Options

If the use of simulations will benefit nursing education by decreasing reliance on already stressed clinical placements and by increasing the consistency and educational effectiveness of clinical experiences, why don't all schools of nursing have clinical simulation laboratories? What are the additional issues to be considered prior to embarking on this educational path?

#### *Equipment and Sustainability Issues*

Currently a great number of educational programs own and utilize various levels of simulation equipment. This includes everything from case studies (paper and pencil) to high fidelity mannequins utilized with teams of student care providers. As one would expect, the higher the technology, the larger the cost to purchase, utilize and maintain the equipment. Although significant, the initial purchase price of a 'Sim-Man' or 'Noelle Birthing mannequin' might be made available through a private donor, fundraising or a grant. However, if the program is considering simulation as a teaching methodology, rather than a one-time event, then the on-going costs related to simulation must be considered. If simulation is a method rather than the goal, then the program has the costs of the entire package related to simulation—faculty development, technical support of the equipment and software, space for the 'laboratory' and equipment storage, systems management and enhancement as technology expands. This requires funding at the program's base level rather than the one-time purchase. Sustainability of the simulation use cannot be dependent upon one-time funding but needs to be incorporated in the initial plans. It was estimated that one medical school spends \$1000 per hour of simulation education. (NCSBN, p. 9). Collaboration with other programs might be appropriate to maintain a center.

#### *Personnel and Administrative Issues*

Simulations must be clearly integrated into the curriculum and driven by the needs of the curriculum. Use of simulations requires a change in the role of the ‘faculty’ from the ‘lecture’ mode which leads to increased preparation time and on-going expenses to develop resources, write scenarios, train faculty, and so forth. After the initial scenario development, faculty or technician time will be needed to set up scenarios, and maintain the equipment and software. The faculty role becomes less the ‘expert’ and more the ‘guide’ and creator and manager of educationally sound scenarios/case studies. Faculty development is necessary in the areas of scenario writing, debriefing post-simulation and evaluation of student competency and program effectiveness.

Beyond the cost of the equipment and software purchases and maintenance, administrative support must include the financial and personnel resources necessary to implement the simulations, for faculty development, and for curriculum development support (i.e. released time, development time as workload assignment). Use of hi-fi simulators by untrained personnel can lead to damaged equipment including ‘skin’ stained by ink from pens or other fluids, to shorted circuit boards and unusable computerized units.

### *Federal Funding Options*

The Health Resources and Services Administration (HRSA) within the Department of Health and Human Services administers a number of key programs funding nursing education, many of them in the Bureau of Health Professions. However, some nursing programs have found federal funding through workforce grants and other sources such as the Department of Labor.

- *The Bureau of Health Professions (BHP)* within HRSA manages Title VIII funds. The Title VIII Nursing Workforce Development funds are the primary source of federal funding for nursing education. These funds have not kept up with inflation, although they are steady (Personal communication, M. A. Rizollo, Jan, 2007). Specific to the use of technology in nursing

education, two five year grants of \$300,000 will be made in 2007 for the “Faculty Development: Integrated Technology into Nursing Education and Practice Initiative”.

- *Area Health Education Centers (AHECs)* work to meet health care provider needs in 45 states and the District of Columbia. AHECs are federal-state matching funds cooperative agreements funded through Title VII of the Public Health Service Act through the Bureau of Health Professions within HRSA. These academic-community partnerships train local health providers, improve the supply and distribution of the health workforce with the goal of increasing access to health care in medically underserved areas. “AHECs link the resources of university health science centers with local planning, educational and clinical resources. This network of health-related institutions provides multidisciplinary educational services to students, faculty and local practitioners, ultimately improving health care delivery” (AHECs, accessed at: <http://bhpr.hrsa.gov/ahec/>).  
Nationally, AHECs support a variety of programs such as collaborative education of medical and nursing students (Rhode Island), interactive television continuing education for school nurses (Vermont), community health workers training and support (California), and an on-line RN to BSN program (California) (National AHEC Organization, accessed at: <http://www.nationalahec.org/About/Highlights-SuccessStories.asp>). The needs are determined locally—allowing for potential collaborations in simulation use by health care providers and nursing education collaborations.
- *The Agency for Healthcare Research and Quality (AHRQ)* in 2006 awarded more than \$5 million for 19 new grants under its Improving Patient Safety Through Simulation Research portfolio. The 19 projects focus on assessing and evaluating the roles that simulation can play to improve

the safe delivery of quality health care. Only one of these projects was authored by nursing at this time. (Improving Patient Safety through Simulation Research, 2006).

### *Department of Labor*

As part of workforce shortage legislation and funding, there have been a number of programs utilizing Department of Labor funds that have been utilized to set up simulation laboratories and programs nationwide. Sustainability becomes an issue after initial development. Two examples follow.

- Many community colleges have received Department of Labor funds as part of a focus to address the labor shortage in nursing. For example, in 2005-2006, Riverland Community College (MN) received over \$2 million from a Department of Labor grant specific to community colleges (Community-based job training initiative) and established a simulation laboratory. The funds included remodeling and equipment. These grants are no longer available and now the challenge is to sustain these laboratories. (Personal communication, V. DeFor, Feb, 1, 2007)
- The President's High Growth Job Training Initiative through the U.S. Department of Labor, awarded \$43 million in 2006 to address the health care labor shortage. The Colorado Workforce Innovation and Technology Demonstration received \$1.6 million and leveraged an additional \$1.3 million, to provide nursing education through the Work Education and Lifelong Learning Simulation Center (WELL) which will incorporate innovative technologies including simulation in the education of students, faculty and practitioners. (Accessed at: <http://www.doleta.gov/BRG/Indprof/Health.cfm>)

### *State Funding Initiatives*

There are several examples of state funding which are being or could be redirected by nursing education to support rural nursing education options. Some of these programs, such as

MERC in Minnesota and the Oregon Simulation Alliance, are unique. However, many state legislatures have made funds available through workforce or technology initiatives for nursing or the healthcare professions in general. Funding levels and focuses vary greatly between states.

**Kansas:**

- In July 2006, the Kansas Board of Regents awarded nearly \$3.4 million in nursing grants to twenty public higher education institutions as the first step in a ten-year, \$30 million commitment to increase nursing capacity in Kansas by 25%. The program has three components which include Nursing Educator Scholarships, Nursing Faculty and supplies, and Equipment and Facility Upgrades. The first year resulted in funding 30 additional sophisticated patient simulators (in addition to faculty—these are not ‘stand alone’ pieces of equipment). (Kansas State Board of Regents, July 2006:

<http://www.kansasregents.org/download/news/072006%20-%20Press%20Release%20-%20Nursing%20Awards.pdf> )

**Illinois:**

- In July 2006, the Illinois state legislature granted funds (Public Act 94-1020) establishing several new initiatives to recruit, train and retain nurses in Illinois. The competitive grants were offered in two categories: Expansion grants to support high-performing schools and Improvement grants for programs to make improvements. For Fiscal Year 2007, the Illinois Board of Higher made seven grants totaling \$1.5 million to public and private schools at three levels: AD, BS and RN-to-BS. Northern Illinois University School of Nursing received \$450,000 and plans to purchase three on-campus Human Patient Simulator Laboratories as part of their expansion, to ease the current shortage of educational sites. (Access at: <http://www.niu.edu/PubAffairs/RELEASES/2007/feb/nursinggrant.shtml>)

**Minnesota:**

- Medical Education and Research Costs (MERC) grants support innovative clinical training for professionals and programs which increase access to services for the underserved. The MERC grant program is a state grant program which has been effective in providing support to hospitals serving the rural and underserved populations. Federal and state funds are combined in a single pool, distributed based on a formula using education and Medical Assistance volume formula. In 2006, \$65 million passed through sponsoring health education institutions to Clinical training sites. The formula requires that 90% of the funding must pass through the sponsoring institution to the Clinical site and 10% is discretionary and must go to a Medical Assistance site. However, the institution can choose the specific program and may re-direct funds. Dental innovations grants such as teledentistry and mobile dentistry are included as well.
- Nursing education initiative funds have been granted by the state legislature to the Minnesota State Colleges and Universities (MnSCU) which includes all the public state universities, community colleges and technical schools, except the University of Minnesota. Some of these funds have been targeted for simulation including 3 major conferences, equipment, and faculty development. MnSCU awarded a total of \$280,000 for nursing education simulation projects in 2006- 2007 and \$125,000 in 2007-2008.

**Oregon:**

- The Oregon Center for Nursing was formed in 2001 in response to the anticipated severe nursing shortage. It has taken a multifaceted approach to addressing the problem including expansion of existing programs, development of new nursing programs, coordinated clinical placement for students and more. One of these strategies is the Oregon Simulation Alliance

which has the vision of an efficient statewide network of simulation technology resources, information and training systems. There is a very collaborative, multidisciplinary focus on healthcare workforce development throughout the state. Alliance participants include hospitals and health systems, all 17 Oregon community colleges, the Oregon Consortium for Nursing Education, four year public and independent colleges and universities, AHECs and other groups. The major focus of the Alliance is to seek funding to develop or expand statewide the use of simulation technology to increase the quality and quantity of Oregon's healthcare workforce.

The Simulation alliance began in 2004 with \$1.5 million in start-up funds. Several sources included the Oregon Workforce Investment Board (\$600,000), the US Department of Labor (\$300,000), Oregon Department of Human Services fund from Homeland Security (\$100,000 for specific ER bioterrorism scenario), the NW Health Foundation (\$50,000) and federal earmark funds. (Invitation to Apply for Simulation Equipment, July 29, 2004). These funds were then made available to coalitions for simulation equipment. Funds have been made available for the full range of simulations including interactive computer-based case studies, scenario development, clinical activities necessary for student demonstration of competency, video conferencing, CD-ROM or other media-based instruction.(Oregon Center for Nursing, 2007).

Policy recommendations for continuation and expansion of governmental funding for  
simulations within nursing education

In light of the current and increasing nursing shortage, the need for efficient use of faculty and clinical education resources, and the pervasiveness of these issues, governmental actions are

necessary in several areas at both the state and federal levels. The coordinated efforts of federal, state and local government, along with the private sector and providers will be necessary to develop increased access to nursing education and health care in rural areas. One of the roles of government is as protector of the public's health.

Government funds provided for healthcare and nursing education providers in rural areas must be flexible enough to allow for creativity and development of locally effective, appropriate systems that support simulations for the local area. This can be done through a variety of funding sources at the state or federal levels including education, rural health, workforce development, public health or homeland security, among others. Mechanisms can include redirection of funds via federal program waivers (i.e. MERC, telehealth) as well as grants

- **Funding for research in simulations.** Simulation technology in nursing education is still a new and developing trend and requires increased research to determine the most effective strategies based upon educational and cost outcomes. Government funding for this research should include the description of best practices in the use of simulations within the nursing curriculum to ultimately assure the best patient care outcomes.
- **Funding specific to research on simulation use in rural areas.** Governmental support of research must be expanded to examine the effectiveness of various strategies in simulations with a focus on the unique issues related to rural health (limited population and resources— financial, equipment and personnel, distances involved, etc.) The rural health care systems' funding bases are generally limited locally, but include a significant population if taken in the aggregate. A multi-state, multi-region focus of research can benefit from a federal perspective. Governmental assistance in coordination of these efforts would also enhance participation by smaller programs unable to independently launch a major research effort.

- **Governmental support through technical expertise** should be provided to stimulate and guide the development of clear educational standards based upon the best research. The state boards of health, education and nursing all provide leadership in the development and maintenance of standards for competence in nursing practice and education. Informed guidance in the development of these standards will come from the professions as well as the oversight bodies and government agencies can serve a valuable leadership role in bringing the policy makers together to do this.
- **Federal and state support for nursing faculty training in incorporating simulations.** Current faculty have not had extensive experience or education in utilization of simulations and will need support in making the transitions to these new modalities. State and federal support to these faculties through funding, tuition assistance, technical assistance, and consultation can make the difference between effective utilization of simulation and expensive equipment on the shelf. This support from various agencies within HRSA, the Department of Labor and the Department of Education (which holds the ultimate responsibility for nursing education at the state and federal levels). In many rural areas, the AHECs are available already and can spearhead some of these efforts.
- **Federal and state support of pilot programs in rural areas.** These pilot programs will focus on evaluating the long and short term financial feasibility and options for sustaining simulations in education. This funding can provide leverage for programs to pursue sustainability through private funding, fee-for-service and other mechanisms. Additional pilot programs should emphasize the multidisciplinary use of simulations and multiple partner collaborations, further assuring future support locally.

Since November of 2006, the National League for Nursing and the American Association of Colleges of Nursing have both held major conferences specifically addressing the issues related to the use of simulation in nursing education. As one participant noted, ‘the presenters began repeating each other—which is what happens when an area is still this new’. Several large, urban, multimillion dollar simulation centers lead the way in utilization of high fidelity human patient simulation. However, many programs of all sizes in all locations (rural, urban) utilize a variety of simulation technologies, as they can afford them and as the technology suits their needs. This trend will expand and governmental support is essential.

**Footnotes:**

1. Critical Access Hospital legislation has supported numerous hospitals in rural communities.

The number of hospitals converting to Critical Access Hospitals has grown more rapidly than expected, beginning in 2002 with 657 hospitals and over 1100 in FY 2005

(<http://www.hrsa.gov/about/budgetjustification07/RuralHospitalFlexibilityGrants.htm>)

2. The Health Services and Research Administration defines ‘telehealth’ as

“ the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health and health administration.

Technologies used in telehealth typically are: videoconferencing, the Internet, store-and-forward imaging, streaming media, and terrestrial and wireless communications. While new applications are increasingly found for using these technologies, significant barriers remain to making these technologies an integral part of daily health care practice. HRSA works to increase and improve the use of telehealth to meet the needs of underserved people, including those living in rural and remote areas, those who are low-income and uninsured or enrolled in Medicaid.” (<http://www.hrsa.gov/telehealth/> accessed Jan. 15, 2007)

## Appendix A

### Types of Simulation

<b>Types of Simulation</b>	<b>Strengths</b>	<b>Limitations</b>
<b>Computer based</b> (i.e. case studies)	Available 24/7 if appropriate Does not require direct faculty /technical supervision Student driven pace of progress Good for knowledge acquisition Low cost	Low fidelity No physical, direct interaction
<b>Virtual patients and hospitals</b> (i.e. on-line virtual hospitals with scenarios, etc.)	Easy access—24/7 without direct faculty supervision Low cost Good for knowledge acquisition Can include multidisciplinary focus	Low fidelity No physical, direct interaction
<b>Task trainers</b> (i.e. specific procedures such as IV training)	Moderate to low cost Good for repetition of specific tasks in safe environment Includes kinesthetic learning	Limited fidelity (i.e. a disembodied arm or torso) May require faculty /technical supervision
<b>Human Patient Simulators</b> (i.e. computerized mannequins)	High fidelity Interactive Offers context for application of theory May include emotional and sensory aspects of nursing care Good for critical thinking, decision-making and delegation practice Good for knowledge integration	Expensive Requires faculty/technical supervision and guidance Limited realism
<b>Standardized Patients</b> (i.e. actors portraying patients)	Very realistic in the interpersonal/emotional realms Excellent for training in communication, interpersonal relationships Good for evaluation	Limited realism in pathology/symptoms Some liability for actors Actors (patients) may become trainers instead of patients May be costly Dependent upon availability and training of SPs

(Table based upon presentation by Dr. Suling Li, National Council of State Boards of Nursing at the American Association of Colleges of Nursing, Hot Issues Conference, April 24, 2007)

## **Appendix B**

Designing and Implementing Models for the Innovative Use of Simulation to Teach Nursing Care of Ill Adults and Children: A National, Multi-Site, Multi-Method study.

This study was co-sponsored with the National League for Nursing and Laerdal, one of the major providers of simulation equipment and training. The study ran from June 1, 2003- May 31, 2006.

The goals were “to explore how to design simulations, implement simulations as a teaching strategy, and evaluate selected learning outcomes using simulations.” (Jeffries & Rizollo, 2007, p. 148). Individual studies at eight sites examining the process and outcomes of different simulation methodologies were included.

The study was conducted in four phases. Phase I focused on organization and study design as well as selection of the Director and the eight sites. Phase II introduced each Project coordinator and colleagues to simulation, followed by a small simulation study at their school using different levels of simulation. This included their initial utilization of the study scales. Phase III consisted of Part 1 which obtained baseline data on student knowledge and Phase 2 examined learning outcomes after different types of learning simulations were implemented. Four hundred three students enrolled in their initial medical-surgical nursing course completed a pretest, viewed a videotaped lecture and demonstration of expert nursing care, after which students were randomly assigned to three groups utilizing different types of simulation (paper/pencil case studies, static mannequin, high fidelity patient simulator). Phase IV was completed at two sites and students utilized two simulations (paper/pencil case study and high fidelity patient simulator) with one group using each simulation first, followed by the other simulation, in order to compare student experience with the different types of simulation.

This series of studies’ findings included “determining that there are significant differences in selected outcomes using a paper/pencil vs. a patient simulator (i.e. satisfaction, self-confidence, active learning, realistic learning)” (Jeffries, NLN, 2006, p. 24). “The outcome measure of knowledge...was eliminated [in Phase IV] since non-significant findings were obtained in the previous study using this measure.” (Jeffries & Rizollo, 2007, p. 152). The authors conclude that “it appears that immersion in a simulation provides the opportunity to apply and synthesize knowledge in a realistic but non-threatening environment. ...when students are more active and immersed in a learning situation, the feedback they receive regarding what they did correctly and incorrectly can greatly facilitate their learning.” (Jeffries & Rizollo, 2007, p. 158). The authors also conclude that “there were no significant differences among the three groups regarding their perceived performance”(p.157), although the authors suggest this might relate to the students’ evaluations being based upon the learning situation context.

<b>Paper/pencil case study groups</b>	<b>High fidelity patient simulator groups</b>
Collaboration and high expectations important	Active learning present and important
Judged their performance significantly higher.	Diverse ways of learning important.
	Presence of feedback, support and objectives important.
	Students were confident and satisfied.

This would suggest that students judge their performance based upon the context of the learning and that knowledge acquisition can be enhanced with simulations at various levels of fidelity. In the rural setting with more limited access to high fidelity resources, knowledge and skills can be gained

utilizing less expensive, low fidelity tools in conjunction with limited, intentional use of high fidelity simulations. This combination can greatly enhance student confidence and satisfaction.

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