Nurse leaders and the innovation competence gap
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**Abstract**

**Background:** Nurses are well-positioned for innovation in health care delivery, although innovation is not generally learned in formal educational programs.

**Purpose:** The purpose of this study was to assess critical competencies for innovation success among nurse leaders in academia and practice, the perceived gaps on those competencies, and teaching methods that would be helpful in developing competencies related to innovation.

**Method:** A Web-enabled descriptive survey design was used to capture nurse leaders’ perceptions of important innovation competencies and how they assess their level of competence in the particular innovation domain. Preferred approaches for innovation pedagogy were also queried.

**Discussion:** Respondents indicated significant gaps in 18 of 19 innovation competencies. Implications are for inclusion of innovation competencies in formal and continuing nursing education. The most preferred innovation pedagogical approaches are case studies of failures and successes and project- and field-based approaches. Traditional lectures are the least preferred way to address innovation competency gaps.

**Conclusions:** There is a significant gap in innovation competencies among nurse leaders in practice and academia. The way we teach innovation needs to involve closer collaboration between academia and practice.


**Introduction**

The health care sector in the United States continues to be plagued with high costs and variable access, uneven quality, and health care outcomes among the lowest of developed countries (The Commonwealth Fund, 2014). Two identified ways to turn around these negative numbers are to increase the pace of innovation and to include innovation education in the curricula for health care administrators and leaders (Herzlinger, Ramaswamy, & Schulman, 2014).

Nurses have a history of being innovative—doing what it takes to serve their patients, often under dire circumstances and in remote places (Kirchgessner & Keeling, 2015). Given that nurse leaders in practice and academia have tremendous responsibility for shaping professional nursing and impacting change at
the frontlines of caregiving, innovation competencies among leaders are essential for reducing costs and improving access and quality (Malloch, 2010). The purpose of this research was to assess competencies that nurse leaders view are most critical for innovation, their self-perceived gaps of those competencies, and teaching methods that would be helpful in learning more about innovation.

Background

Drucker (1985) described innovation as a discipline that methodically analyzes areas of opportunity and strives “to create purposeful, focused change in an enterprise’s economic or social potential.” In 2010, the Patient Protection and Affordable Care Act drastically changed the landscape of health policy. Several aspects of the law not only encourage innovation but make provisions for incentivizing innovation. For example, the creation of the Centers for Medicare and Medicaid Services Innovation Center is charged with pioneering novel patient care delivery and financing models (Centers for Medicare and Medicaid Services [CMS], 2015).

Innovations are disruptive because they challenge the status quo. Individuals who do not understand or do not value the innovation are unlikely to be supportive which may create open criticism, which in turn is a deterrent to innovation (Giddens, 2015). Christensen (1997) describes innovations as disruptive because they involve a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors. Health care leaders are charged with balancing the cost and quality conundrum: providing the best health care services to satisfy the triple aim of affordable cost, excellent quality, and access for all. Disruptive innovations are needed at the frontlines of care delivery and in the education of future health care leaders to successfully implement changes necessary to achieve these aims.

Herzlinger (2006) posits that innovation could make health care better and less expensive by changing the way consumers buy and use health care, using technology to develop new ways to improve care, and generating new business models to integrate health care services. She asks the question, “Why is innovation in health care so hard?” To answer the question, Herzlinger (2006) explains that the innovation barriers include multiple stakeholders with differing agendas, lack of access to venture capital due to the complex nature of sources of reimbursement, a highly regulated environment that may not be “innovator friendly,” knowing when to invest in medical technology, lack of acknowledgment of growing consumer empowerment, and the requirement of consumers and payers for improved organizational accountability. To explain barriers to innovation, other researchers have applied the concept of “dominant logic” or organizational mindset, to the nursing profession (Begun & White, 1999) and to hospitals and health systems (White, Thompson, & Griffith, 2011) because they often hold deeply institutionalized organizational cultures. Why is it that organizations may know the best practices, although there are barriers to implementing large-scale changes? Challenging the dominant logic is difficult for several reasons. The translation of data to information is influenced by the organization’s history, culture, and “reinforcers” of the dominant logic. The reinforcers—policies, procedures, accreditation standards, licensure laws, and others—are ingrained in the way that health care professionals are educated and socialized. Health care professionals are trained to see the world through the lens of their particular profession which has its own way of transmitting tradition, ritual, and interpretation of data. Reinforcers of the dominant logic stifle innovation.

To examine a way that education and socialization of health care professionals could be modified, Herzlinger et al. (2014) convened an international workshop of health care management academics and top executives of health care industry organizations to discuss opportunities for innovation to be included in a modern curriculum for aspiring health care executives. The research of Herzlinger (2013) pointed to the divergent knowledge, skill-set goals, and curricula of health care management programs and what senior executives are looking for in knowledge and skills in hiring managers and leaders. The conclusion from this research is that more innovation education should be included in curricula, and the preferred method of teaching is with case studies (successes and failures).

O’Brien, Polit, & Fitzpatrick (2011) used the Scale for the Measurement of Innovativeness (Rogers, 2003) in a study of 106 chief nursing officer respondents in New York State. This study found that chief nursing officers who completed more leadership courses had implemented significantly more types of innovations and had higher innovativeness scale scores. Although nurses may be good at generating practice ideas through research or creative problem-solving, the adoption of good ideas and the diffusion of innovation are the challenges (Berwick, 2003; Rogers, 2003).

Although researchers have devoted considerable effort in identifying traits, characteristics, values, affective states, and cognitive styles that are associated with innovation in nursing (Malloch & Melnyk, 2013; O’Brien et al., 2011) and how innovation led to entrepreneurial success (Roggenkamp & White, 1998), the particular competencies that support innovation remain elusive. Determining such competencies is further complicated by a failure among scholars to distinguish business skills from innovation skills. That is, both the academic literature and educational programs in innovation have tended to emphasize the need for competence at such general business
functions as selling, producing, supervising employees, coordinating logistics, arranging financing, and measuring results. Although such skills are vital for the day-to-day operations of any business, they do not address the unique requirements for innovation in the health sector context. There is scant evidence in the literature to guide the description of specific validated competencies of innovation for nurse leaders and how they are learned and implemented.

**Methods**

A Web-enabled descriptive survey design was used to capture nurse leaders’ perceptions of innovation competencies which are important in their jobs and concomitantly, how they assess their level of competence in the particular innovation domain.

**Sample Selection**

The authors were interested in surveying a large sample of nurses who held a leadership position in a health care organization or who were nationally recognized academic or practice nursing leaders. Nurse leaders in Virginia numbering 152 and 1,286 members of the American Academy of Nursing representing all 50 states were selected for the sample, for a total sample size of 1,438. If known, retired and unemployed nurses were not included in the sample.

**Survey Design and Administration**

The design of the survey instrument was based on innovation competencies identified by Pillay and Morris (2016) and validated with health administration practice and academic leaders (Herzlinger, 2013) and nurse leaders (Pillay, White, & Huang, 2016), as described in Table 1. The survey instrument also included items about nurses, the organization of practice, experience, and educational background of the respondents.

After institutional review board approval by the University of Virginia, e-mails were distributed to the sample, containing information about the study. The e-mail message contained a link to begin the survey which opened a page about informed consent. If the person consented, they were directed to begin the online survey. The nurses in the study were assured anonymity.

Of the potential 1,438 respondents, 20 e-mails were returned as undeliverable, and six were ineligible because they declined to participate, or had retired, reducing the potential respondents to 1,412. To increase the response rate, a follow-up e-mail was sent out 2 weeks after the initial survey request. A total of 347 responses (25%) were received from electronically transmitted surveys by the designated date. Forty-two surveys were incomplete; therefore, the final sample size varies according to the responses which were usable. Data were entered into an excel spreadsheet before being imported into the SAS software package for analysis.

**Measures and Variables**

**Importance of Innovation Competencies**

Based on previous validated surveys with health care executives (Pillay & Morris, 2016), respondents were asked to rate the importance of 19 skills, attitudes, and behaviors regarding innovation capabilities of nurse leaders, which are described in Table 1. Using a forced-response technique, respondents were asked to rate innovation competencies as not at all important, low importance, neither important nor unimportant, important, or very important.

**Self-Assessed Level of Innovation Competencies**

Using the same 19 skills, attitudes, and behaviors comprising innovation that are described in Table 1, respondents were asked to rate their level of competence. The forced-response choices for self-assessed level of competence were very poor, poor, neutral, good, or very good.

**Importance of Pedagogical Approaches to Develop Innovation Competencies**

To assess the importance of pedagogical or teaching methods in developing innovation competencies, teaching methods were listed with a forced-response answer of not at all important, low importance, neither important nor unimportant, important, or very important. The 10 pedagogical approaches for the development of the 19 competencies are described in Table 2. Respondents were also given an open-ended question which asked them to list other pedagogical approaches that may be useful in developing innovation competencies.

**Demographic Variables**

Several measures were collected as demographic or control variables, including gender, highest level of nursing education, advanced education in management, age, number of years as an RN, amount of management experience, number of direct reports, certifications, practice setting, type of experience with exposure to innovation, and nursing role.

**Data Analysis**

Univariate analyses included measures of central tendency and frequency distributions, whereas paired t tests were used to test the significance of the differences in ratings and self-assessments of the innovation competence gap. The two sample t test was used to test the significance of the difference in ratings of importance and self-assessment between academics and practitioners.
Findings

Characteristics of Respondents

As can be seen in Table 3, most respondents were female (89%) and age 50 years or older (88%) with 57% occupying positions in academia; of which, more than half were at the Dean or Chair level. Twenty-eight percent of respondents worked in hospitals or health systems, whereas 8% worked as consultants. Ninety percent had either doctoral- or masters-level educational preparation, and 63% had >10 years of managerial experience. Only 24% reported having any formal training in business or management, whereas only 8% reported no exposure to innovation or entrepreneurial behavior. Of those who did report some experience with innovation and entrepreneurship, being self-taught (78%) was the most common mode of exposure, although 24% reported having some formal training in the area.

Table 1 – Innovation Competencies and Brief Definitions

<table>
<thead>
<tr>
<th>Innovation Competencies</th>
<th>Brief Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The ability to recognize an opportunity</td>
<td>Scan and search for new information, “connect the dots” between incidents that appear to be unrelated with limited cues, and recognize patterns or ideas that suggest potential opportunities in the myriad cues or signals that they receive.</td>
</tr>
<tr>
<td>2. The ability to assess the feasibility of an opportunity</td>
<td>Make evaluations or judgments on whether emerging information or changes would lead to viable opportunities with potential to create value.</td>
</tr>
<tr>
<td>3. Risk management/mitigation</td>
<td>The systematic monitoring, assessing, hedging, transferring, and/or exploiting of risks.</td>
</tr>
<tr>
<td>4. Ability to convey a compelling vision</td>
<td>Capability to convey a vision of the innovation and its potential impact in ways that are compelling.</td>
</tr>
<tr>
<td>5. Tenacity and perseverance</td>
<td>Commitment to seeing their vision through, able to endure the long journey to implement innovation, able to work fervently despite challenges or adversity, are able to maintain interests, and can persist in efforts in achieving goals.</td>
</tr>
<tr>
<td>6. Creativity problem-solving/imagination</td>
<td>Ability to engage in a process of creative imagination in which ideas and opportunities are developed.</td>
</tr>
<tr>
<td>7. The ability to leverage resources/bootstrapping</td>
<td>Ability to overcome resource constraints and leverage the resources of others, combine resources uniquely.</td>
</tr>
<tr>
<td>8. Guerrilla skills/use of unconventional approaches</td>
<td>Clever ways to take advantage of one’s surroundings, do more with less, rely on unconventional tactics, and utilize resources not recognized by others in accomplishing tasks.</td>
</tr>
<tr>
<td>9. Ability to maintain focus yet adapt</td>
<td>Ability to continuously adapt while also maintaining a sense of strategic direction and focus.</td>
</tr>
<tr>
<td>10. Resilience</td>
<td>Tendency of an individual to cope with stressful, adverse, and devastating situations, to be able to recover from failures, and to constructively sustain his or her efforts of pursuing goals.</td>
</tr>
<tr>
<td>11. Design thinking</td>
<td>Value creation with new products, services, and business models: ability to question, observe, and experiment.</td>
</tr>
<tr>
<td>12. Self-efficacy/confidence</td>
<td>Self-confidence and self-assurance about his or her ability to take on challenges, to perform certain sets of tasks as needed or expected, and to control processes, contingencies, or consequences in the entrepreneurial pursuit.</td>
</tr>
<tr>
<td>13. Building and using networks</td>
<td>Ability to establish, maintain, and structure his or her contact network/s in ways that foster relationships, enhance access to opportunities and/or resources, and potentially lead to realization of his or her objectives.</td>
</tr>
<tr>
<td>14. Change management</td>
<td>Ability to help stakeholders to accept and embrace changes in their work environment.</td>
</tr>
<tr>
<td>15. Understanding of health care systems</td>
<td>Understanding of what the component parts of the health system are, how they work, and their interrelationships.</td>
</tr>
<tr>
<td>16. Cross disciplinary knowledge</td>
<td>Knowledge about science, technology, medicine, economics, human behavior, public policy, and other relevant disciplines that impact on health/health care.</td>
</tr>
<tr>
<td>17. Information management</td>
<td>Ability to utilize data to identify and predict trends and patterns.</td>
</tr>
<tr>
<td>18. Understanding of behavioral economics</td>
<td>Knowledge about how decisions are made and the mechanisms that drive public choice.</td>
</tr>
<tr>
<td>19. Interdisciplinary teamwork and collaboration</td>
<td>Ability to communicate and work with different professions and disciplines; appreciate and understand different professional cultures; and understand equality in responsibilities and reciprocity.</td>
</tr>
</tbody>
</table>

From Pillay et al., 2016.
Innovation Competency Gaps

As shown in Table 4, the mean responses on the 19-item innovation competency instrument are tallied for competency “importance” and self-assessed “competence.” This, then, is our measure of the innovation competency gap. There were statistically significant differences in competency gaps in 18 competency domains. Only one competency—perseverance and tenacity—was seen as important, and the respondents indicated they possessed that competency.

The competencies that are important are shown in rank order in Table 4. The top five competencies that are viewed as important in innovation are ability to convey a compelling vision, resilience, ability to recognize an opportunity, tenacity and perseverance, and interdisciplinary teamwork. Two sample t-tests between academics and practitioners for all 19 competencies showed no significant differences at the 0.05 level for ratings of importance and self-assessed competence.

Pedagogical Approaches

As shown in Table 2, the highest rated and relevant pedagogical approaches to developing innovation competencies are case studies of failures, project-based exercises, field-based exercises, and case studies of successes. The respondents exhibited high concurrence for these preferences. Traditional lectures were rated as being least relevant. Two sample t-tests between academics and practitioners showed no significant differences at the 0.05 level in the ratings of pedagogical approaches between academic and practice leaders.

Discussion and Recommendations

With the intensity and complexity of health care services, more emphasis on evidence-based approaches to patient care delivery, and interprofessional collaboration, “business as usual” will not be enough to sustain health care delivery organizations. Health care managers and leaders must possess innovation competencies, which should be considered the “new normal.” Nurse leaders must incorporate the innovation competencies described in this article into formal
management degree programs and in continuing education programs. The competence domains and pedagogical approaches proposed by Pillay and Morris (2016) for health care leaders (non-clinician) and validated by nurse leaders (Pillay et al., 2016) suggest that a fairly generic approach to innovation capacity development could be adopted by nurse leaders and health care leaders alike.

The innovation competency domains discussed in this article provide educators with the framework to support innovation education with specific knowledge and skills. Teaching effectiveness may be measured by paying attention to the pedagogical methods that are preferred by experienced nurse leaders in academia and practice. Courses can be designed to develop students’ specific competencies, with incorporation of case studies of failures and successes, project-based, and field-based experiential learning. Imparting knowledge of the professor through the traditional lecture approach is not the best way to teach innovation. To bolster innovation education, bringing experienced health care or nurse leaders into the classroom will provide an opportunity for collaboration with academics in course development and delivery and thereby bring real world experience to the classroom. Students would then be provided with opportunities to solve real-world problems in their organizations. Reinforcing closer collaborations between practice and academia is necessary to prepare the current and future generations of nurse leaders for the challenges in delivering the best possible health care (Clarke, 2013).

There are several implications for nursing education and practice. First, nursing graduate programs in health systems management should be evaluated for how and where to include innovation competencies. However, education in innovation should not be limited to health systems management; the introduction of innovation competencies is relevant for all nursing programs. Similarly, innovation competencies should be included in interprofessional continuing education programs to bolster knowledge and skill for nurses in all ranks and practice settings.

At the bedside, nurses need support to enhance their creativity in devising new and better ways to provide patient safety and comfort. One such resource is MakerNurse, an organization supported by the Robert Wood Johnson Foundation, which examines nurse innovation in U.S. hospitals and identifies tools and resources that help nurses bring their ideas to fruition and lead improvements in patient care (MakerNurse, 2016). With the right support, nurses can take their ideas and turn them into better ways to care for patients. One deterrent to the nurse innovator is the fear of failure, “rocking the boat,” and criticisms from colleagues if an initiative should fail. Nurse leaders may lend support to innovators by challenging the dominant logic in ways that encourage and incentivize innovation.

There are several limitations to this study. First, the survey was targeted to nurse leaders in academia and practice, with most of the respondents from academia. The thinking behind this was to target the nurse leaders who are shaping the profession at the national and international levels to determine their views of innovation competencies. In addition, the competency domains do not directly address how to engage frontline staff in innovation. Some of the language in the innovation competency domains such as “guerilla skills” and “behavioral economics” may be terms that are more familiar in the corporate business community.

### Table 4 – Innovation Competence Gaps (Rank Order of Importance, Difference of Means, and Paired t Test)

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Mean Importance</th>
<th>Mean Competence</th>
<th>Difference of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to convey a compelling vision</td>
<td>297</td>
<td>4.764</td>
<td>4.453</td>
<td>0.310*</td>
</tr>
<tr>
<td>2. Resilience</td>
<td>292</td>
<td>4.756</td>
<td>4.515</td>
<td>0.243*</td>
</tr>
<tr>
<td>3. The ability to recognize an opportunity</td>
<td>294</td>
<td>4.743</td>
<td>4.539</td>
<td>0.214*</td>
</tr>
<tr>
<td>4. Tenacity and perseverance</td>
<td>293</td>
<td>4.723</td>
<td>4.676</td>
<td>0.061</td>
</tr>
<tr>
<td>5. Interdisciplinary teamwork and collaboration</td>
<td>297</td>
<td>4.652</td>
<td>4.560</td>
<td>0.092**</td>
</tr>
<tr>
<td>6. Building and using networks</td>
<td>296</td>
<td>4.616</td>
<td>4.283</td>
<td>0.335*</td>
</tr>
<tr>
<td>7. Creativity problem-solving/imaginativeness</td>
<td>295</td>
<td>4.609</td>
<td>4.404</td>
<td>0.210*</td>
</tr>
<tr>
<td>8. The ability to assess the feasibility of an opportunity</td>
<td>295</td>
<td>4.575</td>
<td>4.338</td>
<td>0.254*</td>
</tr>
<tr>
<td>9. The ability to leverage resources/bootstrapping</td>
<td>293</td>
<td>4.546</td>
<td>4.142</td>
<td>0.427*</td>
</tr>
<tr>
<td>10. Self-efficacy/confidence</td>
<td>291</td>
<td>4.541</td>
<td>4.279</td>
<td>0.265*</td>
</tr>
<tr>
<td>11. Change management</td>
<td>292</td>
<td>4.532</td>
<td>4.071</td>
<td>0.500*</td>
</tr>
<tr>
<td>12. Ability to maintain focus yet adapt</td>
<td>292</td>
<td>4.532</td>
<td>4.374</td>
<td>0.144*</td>
</tr>
<tr>
<td>13. Understanding of health care systems</td>
<td>290</td>
<td>4.385</td>
<td>4.167</td>
<td>0.231*</td>
</tr>
<tr>
<td>14. Cross-disciplinary knowledge</td>
<td>291</td>
<td>4.321</td>
<td>4.219</td>
<td>0.090*</td>
</tr>
<tr>
<td>15. Guerrilla skills/use of unconventional approaches</td>
<td>291</td>
<td>4.170</td>
<td>3.922</td>
<td>0.258*</td>
</tr>
<tr>
<td>16. Risk management/mitigation</td>
<td>295</td>
<td>4.316</td>
<td>3.953</td>
<td>0.373*</td>
</tr>
<tr>
<td>17. Design thinking</td>
<td>292</td>
<td>4.302</td>
<td>3.976</td>
<td>0.326*</td>
</tr>
<tr>
<td>18. Information management</td>
<td>292</td>
<td>4.301</td>
<td>3.956</td>
<td>0.315*</td>
</tr>
<tr>
<td>19. Understanding of behavioral economics</td>
<td>290</td>
<td>4.030</td>
<td>3.672</td>
<td>0.360*</td>
</tr>
</tbody>
</table>

*p < .0001; **p < .05.
than that in nursing. Nurses may not be comfortable with guerrilla skills and competition for scarce resources.

As stated at the outset, nurses have always been innovators to get what they need for the best care for their patients. They have tenacity and perseverance. Creative work of nurses for the best patient outcomes may yield discoveries and approaches that could be diffused to others to make substantial changes in health care delivery. Nurse leaders are in a position to reward innovation, risk-taking, and the other behaviors and skills that promote discovery and new and better ways of doing things.

Future research should include sampling the innovation competencies of nurses at the frontlines of patient care. Ways to encourage and incentivize nurses to innovate would be helpful in guiding nurse managers and leaders.

**Conclusions**

The findings identify significant gaps in all but one of the innovation competencies as determined by a national sample of nurse leaders representing academia and practice. This suggests that there is an opportunity for comprehensive innovation education and training for current and aspiring nurse leaders and also provides a foundation for nursing management educators to construct educational programs that more accurately help students develop attitudinal, social, and behavioral competencies to support their innovation activities. The findings also provide compelling evidence for the need to change the way we currently develop these competencies to include case studies of failures as well as successes and project- and field-based experiential learning with a closer collaboration between academia and practice.

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