# Self-Assessment of Nursing Informatics Competencies for Doctor of Nursing Practice Students

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This study examined the informatics competencies of doctor of nursing practice (DNP) students and whether these competencies differed between DNP students in the post-baccalaureate (BS) and post-master's (MS) tracks. Self-reported informatics competencies were collected from 132 DNP students (68 post-BS and 64 post-MS students) in their first year in the program (2007 to 2010). Students were assessed in 18 areas of 3 competency categories: computer skills, informatics knowledge, and informatics skills. Post-BS students were competent in 4 areas (computer skills in communication, systems, documentation, and informatics knowledge about impact of information management), whereas post-MS students were competent in only 1 area (computer skills in communication). Students in both tracks reported computer skills in decision support as their least competent area. Overall, post-BS students reported slightly higher than or similar competency scores as post-MS students, but scores were statistically significant in only 3 of 18 areas. The assessment indicated that knowledge and skills on informatics competencies need to be improved, especially in computer skills for data access and use of decision support systems. Strategies are suggested to integrate competencies into existing informatics course and DNP curricula. Further studies are recommended using an objective measure of informatics competencies. (Index words: Informatics competencies; Nursing informatics; Doctor of nursing practice; DNP; Self report) J Prof Nurs 29:381–387, 2013. 

THE DOCTOR OF Nursing Practice (DNP) was announced in 2006 as a new kind of doctoral degree for nurses by the American Association of Colleges of Nursing (AACN, 2006). For new DNP programs, the curriculum should contain eight essential areas of curricular content, one of which is "information systems/technology and patient care technology for the improvement and transformation of health care" (AACN, 2006). Integrating informatics into the DNP curriculum requires, as a first step, accurately assessing current level of informatics competencies in DNP students outlined by the AACN and the National Organization of Nurse Practitioner Faculties (NONPF, 2011). Incorporating assessment of informatics competency into the curriculum is essential for adjusting the teaching method or content of the informatics curriculum to the students' various needs (Jenkins, Wilson, & Ozbolt, 2007).

Despite the importance of assessing informatics competencies in the DNP curriculum, no study to date has reported informatics competencies of DNP students. A review of the literature revealed that a few studies addressed informatics in advanced practice programs including the DNP, and most of these studies defined areas of competency (Cronenwett et al., 2009; Curran, 2003) or the extent to which graduate program has incorporated information technology skills and knowledge into nursing curricula (McNeil et al., 2003). Several reported strategies to integrate informatics competencies in a DNP or master's (MS) curricula (Grant & Brettle, 2006; Jenkins et al., 2007; Manning & Frisby, 2011). The purpose of this article is to report the informatics competencies of DNP students from 2007 through 2010 and to suggest competency areas that will strengthen the informatics

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curriculum. Strategies are also suggested for integrating competencies into existing DNP curricula, with a specific example of how competency findings were integrated into a nursing informatics course. Because DNP students in the post-baccalaureate (BS) and post-MS tracks have different educational backgrounds and might have different preparation levels in informatics, we also examined whether informatics competencies differed between DNP students in these two tracks.

## Informatics Competencies in BS Nursing Education

BS nursing students' information technology abilities have been well studied, along with recommended interventions to improve these competencies. In general, BS nursing students have been evaluated as having competent (Desjardins, Cook, Jenkins, & Bakken, 2005) or moderate informatics and technology knowledge, attitudes, and skills (Fetter, 2009; McDowell & Ma, 2007). Desjardins et al. examined the effect of informatics for evidence-based practice courses on nursing informatics competencies in students at the end of the BS year of a combined BS/MS program. They found that students were competent in four areas: computer skills: communication; computer skills: basic desktop software; computer skills: systems; and informatics knowledge: impact (Desjardins et al., 2005). More recently, graduating BS nurses were found to have moderate information technology skills (Fetter, 2009). These students were most confident in their Internet, word processing, and systems operations skills and rated themselves lowest on care documentation and planning, valuing informatics knowledge, skills development, and data entry competencies (Fetter, 2009). Following formal training and hardware provision, modest improvements were found in basic informatics knowledge and skills but fewer gains in advanced skills and information literacy for nurses at the BS (McDowell & Ma, 2007) and post-BS (Cole & Kelsey, 2004) levels. Improved skills have been associated with specific educational approaches, such as distance learning (Cole & Kelsey, 2004; Kenny, 2002), the Nightingale Tracker system and personal digital assistants (Miller et al., 2005; Ndiwane, 2005), and clinical simulation methods (Rhodes & Curran, 2005).

The informatics content of curricula for BS nursing students was found to be limited, largely because of nursing faculty's lack of familiarity with computerized systems and knowledge of informatics competencies (Ornes & Gassert, 2007). To address informatics shortcomings in a BS nursing curriculum, the authors designed five assignments to incrementally increase students' abilities to recognize the need for information (i.e., knowledge); advance their abilities to locate, evaluate, and use information (i.e., skills); and foster a positive appreciation for information literacy (i.e., attitudes) when planning safe and effective patient care (Flood, Gasiewicz, & Delpier, 2010).

The informatics and technology competencies of BS nursing graduates were issues of concern in two surveys of nurse executives and deans and directors of undergraduate and graduate programs (McCannon & O'Neal, 2003; McNeil et al., 2003). The nursing executives reported that new graduate nurses needed to be familiar with nursing-specific software such as computerized medication administration systems (McCannon & O'Neal, 2003). The executives recommended improving incorporation of these skills into nursing curricula, but the deans and directors of nursing programs reported no formal evaluation of student informatics competencies and rated faculty who were teaching informatics content at the “novice” or “advanced beginner” level (McNeil et al., 2003).

## Informatics Competencies in Graduate Education, Including DNP Education

The few studies that have addressed informatics competencies in graduate students have defined the areas of competency for nurse practitioners (Cronenwett et al., 2009; Curran, 2003), or the extent to which graduate programs have incorporated information technology skills and knowledge into MS nursing curricula (McNeil et al., 2003), or suggested strategies to integrate informatics competencies in a DNP or a MS curriculum (Grant & Brettle, 2006; Jenkins et al., 2007; Manning & Frisby, 2011). For example, the deans and directors of nursing programs in one study reported that the lowest informatics technology content areas taught in the graduate program were standard languages or terminologies or data standards for information systems (McNeil et al., 2003). In addition, a foundational course was proposed for all DNP students with strategies for integrating informatics throughout the curriculum, for example, requiring students to use informatics tools to search for and evaluate population-based health knowledge in epidemiology, research, and statistics courses (Jenkins et al., 2007). Informatics competencies were one of several competencies, along with their related knowledge, skills, and attitudes, integrated into an existing online DNP patient safety course (Manning & Frisby, 2011). The students formed teams to produce educational videos on hand hygiene, which provided the vehicle for experiential learning, interpretative thinking, reflective practice, and peer review to facilitate DNP student achievement of advanced competencies in teamwork and collaboration, evidence-based practice, and informatics into their existing course (Manning & Frisby, 2011). The literature searching skills of MS- and doctoral-level students ($n$ = 13) improved after taking a Web-based tutorial developed as part of a 12-week evidence-based practice module on health and social care (Grant & Brettle, 2006).

In summary, this review of the literature reveals a lack of studies on informatics competency assessment of DNP students. Existing literature has focused solely on defining the areas of competency (Cronenwett et al., 2009; Curran, 2003; McNeil et al., 2003) or strategies to