

**Title:**

Factors Predicting Mastery of Informatics Competencies in Doctor of Nursing Practice Students

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**Abstract Summary:**

Information technology is increasingly utilized in care delivery. While competence in Informatics is recommended for Doctor of Nursing Practice (DNP) students, factors predicting the mastery of Informatics competencies requires further study. The purpose of this study was to analyze factors predicting the ability of DNP students to master Informatics competencies.

**Learning Activity:**

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
The learner will be able to describe the factors predicting success in mastering Informatics competencies.	Provided results of analysis on factors, including prior experience with information technology and highest degree obtained, on predicting mastery of Informatics competencies.
The learner will be able to describe a comprehensive assessment matrix to evaluate courses with post-Baccalaureate and post-Masters students.	Provide an example of an assessment matrix.
The learner will be able to explain the factors creating the need for DNP students to demonstrate mastery of Informatics competencies.	The review of literature/background will describe the factors which have created the need for DNP students to demonstrate mastery of Informatics competencies.

**Abstract Text:**

Healthcare is undergoing rapid transformation related to many factors including the increasing use of information technology in care delivery, reimbursement, and the utilization of big data. Doctor of Nursing Practice (DNP) providers are at the forefront of these changes and challenges and are in a position to use information technology to monitor and improve health care outcomes. Doctor of Nursing Practice programs have experienced rapid growth across the country with 18,352 students enrolled in 2014 according to AACN's 34th Annual Survey of Institutions (AACN 2015). Students entering these programs have varying levels of educational backgrounds, experience, and years in practice. The American Association of Colleges of Nursing (2006) and the National Organization of Nurse Practitioner Faculties (2011) have both recommended that DNP graduates be competent in the use of information technology. However, the factors predicting the ability of DNP students to master Informatics competencies requires further study. The purpose of this study was to analyze two factors which may predict the ability of DNP students to master competencies in an online Informatics course.

The Health Information Technology for Economic and Clinical Health (HITECH) Act created incentives for hospitals and providers to receive increased reimbursement for the use of electronic health records (EHRs) (Blumenthal & Tavenner, 2010). This has also provided the mechanism for increasing amounts of data to be available for providers to utilize in analysis and monitoring of care delivery. McGonigle and colleagues (2014) assert that nurses evaluate data to positively affect care provided. While there has been considerable growth in the use of EHR systems, this growth is substantially less in physician offices (Furukawa et al., 2014). This provides further impetus for Nurse Practitioners (NP), especially those in Family Nurse Practitioner (FNP) programs, to become expert in these systems to effectuate the continued expansion and use of EHR and other information technology. Because nurses are on the forefront of the

use of information technology, it is imperative that DNP students be expert in the ability to maximize their use of this technology. Therefore, DNP programs are challenged to continually evaluate and modify, if necessary, course content to provide that DNP graduates are able to master informatics knowledge and skills (Hwang & Park, 2011).

Choi and colleagues (2013) demonstrated that while undergraduate and graduate nursing students did not perceive themselves competent in applied computer skills, the graduate students exhibited higher scores in some areas of informatics skills. Another study showed that the highest degree obtained predicted mastery of some Informatics competencies (Kupferschmid, Creech, Lesley, Filter, and Aplin-Kalisz, in press). Understanding student baseline experience and education is important in the design and revision of Informatics courses. Hunter (2013) recommended the assessment of student competencies to determine where curricula or course redesign need occur.

**Methods:** A descriptive design was used to examine the effects of experience and education on mastery of Informatics competencies. A convenience sample of students enrolled in an online Informatics course were asked to complete a self-assessment, at the beginning of the course, rating their experience working with Meaningful Use (MU), datasets, databases, e-health systems, and clinical support systems. Data were also collected on demographic characteristics and end of course faculty determination of students' mastery of competencies which included application of MU concepts, utilization and datasets or databases, application of e-Health principles in a teaching plan, and analysis of clinical support systems. Students' scores on these competencies were assigned a value of 1 (mastered) or 0 (did not master). Logistic regression (binomial) was performed to assess the impact of experience and highest degree obtained on mastery of Informatics competencies.

#### **Results:**

This study is part of an ongoing analysis of factors predicting success mastering informatics content. We have previously examined the individual effect of degree (post-Baccalaureate and post-Masters) or experience with information technology on mastery of Informatics competencies. To determine the effect of experience and degree together, we examined the effect of both on mastery of several Informatics competencies.

The majority of the students were females (91%) who held BSN degrees (80%). Most students were in the Family Nurse Practitioner concentration (34.5%) while the remainder were in the Adult-Gerontology Acute Care Nurse Practitioner (20%), Adult-Gerontology Nurse Practitioner (18.2%), or Psychiatric Mental Health Nurse Practitioner concentrations (14.5%).

Students were evaluated in relation to the mastery of a competency focused on data entry and analysis as well as graphic display of results. This competency assessed students' abilities to acquire skills to work with spreadsheets. Analysis revealed that prior experience working with datasets or highest degree obtained did not predict mastery of this competency while controlling for either variable.

Another competency focused on exploration of public health databases. This competency was designed to evaluate students' abilities to work with publicly available databases. Analysis revealed that prior experience working with databases and degree were not predictors of mastering of this competency while controlling for both variables.

A third competency was designed to assess students' abilities to develop a case study for a vulnerable patient. Students also recommended resources available on the Internet and matched those resources to the learning needs of their patient. Analysis revealed that experience with e-Health systems did predict mastery of this competency while controlling for highest degree obtained ( $p = .03$ ). Highest degree obtained while controlling for experience did not predict mastery.

To assess students' abilities to maximize use of clinical support systems, students were evaluated in relation to their evaluation of clinical support systems. Analysis revealed that prior experience with clinical support systems or highest degree obtained did not predict mastery while controlling for the other variable.

Students were also asked to analyze the challenges related to achieving MU objectives. Analysis revealed that prior experience with MU, while controlling for highest degree obtained, predicted mastery of this competency ( $p = .0015$ ). Analysis of the effect of the highest degree obtained while controlling for prior experience with MU revealed that the effect of degree approached significance ( $p = .08$ ).

#### Conclusion:

This analysis reveals that factors, such as previous experience with specific informatics concepts, may affect mastery of Informatics competencies. While this study did not find that highest degree obtained predicted competency, it is part of an ongoing analysis of factors which may predict success with mastering informatics knowledge and skills. We recommend a comprehensive assessment be constructed to evaluate students in courses which include both post-Baccalaureate and post-Masters students. This analysis should be used to determine whether course content needs revision or modification.