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The project and the manuscript have been successfully completed and meet the standards of the School of Nursing University. The project demonstrates the application of professional knowledge, clinical expertise, and scholarly thinking. An abstract of the project and two copies of the manuscript are attached.

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Evaluation of Strategies to Enhance NCLEX-RN Success

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Performance of graduates on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) is a major indicator of the quality of nursing programs. Successful performance on the NCLEX-RN is a measure of competence that ensures safe nursing practice. Failure to pass the NCLEX-RN affects a student's ability to practice nursing. One urban state university noted an ongoing problem with the success rate of first time takers of the NCLEX-RN examination. The purpose of this research project was to focus on one urban state university's NCLEX-RN pass rates for first-time candidates, to examine recent strategies implemented by this School of Nursing's baccalaureate program to improve the pass rates for the NCLEX-RN, and to evaluate the effectiveness of these strategies. A retrospective descriptive study was the research design for this project. The subjects (N= 680) for this study were regular progression undergraduate nursing students at a state university who completed NCLEX-RN testing during the period from January 2004-December 2008.

Running Head: STRATEGIES TO ENHANCE NCLEX-RN SUCCESS

Evaluation of Strategies to Enhance NCLEX-RN Success

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Abstract

Successful performance on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) is a measure of competence indicating that newly licensed nurses have attained standards to ensure safe nursing practice. Concerned about a declining pass rate, one urban state university implemented multiple strategies over a period of time in order to enhance the success rate of first-time test-takers. The purpose of this research project was to focus on the state university's NCLEX-RN pass rates for first-time candidates, examined and evaluated new implemented strategies, and determined how the interventions influenced these pass rates. Data were collected using retrospective existing records on a sample of 680 subjects.. These included more stringent admission criteria, several testing modalities, and students' progression policies. Passage of the NCLEX-RN exam assures the competencies required for safe patient care. Findings indicate a variety of strategies could be implemented by other Schools of Nursing to enhance their students' success.

Evaluation of Strategies to Enhance NCLEX-RN Success

The performance of graduates on the National Council Licensure Examination for

Registered Nurses (NCLEX-RN) is a major indicator of the quality of all nursing

programs. Successful performance on the NCLEX-RN is a measure of competence that

ensures safe nursing practice. With the current nursing shortage, increased students'

enrollment, and the diverse population of students, schools of nursing must be proactive

in promoting success of their students (Davenport, 2007).

All nursing programs strive to prepare their students with a comprehensive

academic foundation, to ready their graduates for competent practice, and to be

successful on the NCLEX-RN exam. Baccalaureate nursing students traditionally score

lower than their peers in associate degree nursing programs. (Haas, Nugent, & Rule,

2004). Nursing faculties are committed to provide students with opportunities that

promote success on the licensing examination. Low NCLEX-RN pass rates can

negatively affect a nursing program's recruitment, retention, accreditation, and funding

(McDowell, 2008).

New nursing school graduates, especially first-time test-takers of the NCLEX-

RN, have a vested interest to be successful because failure to pass the NCLEX-RN

affects graduates' ability to become licensed and practice nursing. It delays their career

and decreases their income potential, not to mention the emotional impact. While

students may not focus on the licensure examination in the beginning of their programs,

nursing faculties are aware of the need to begin preparation early for the licensing

examination (Davenport, 2007; McDowell, 2008). Changes in the NCLEX-RN test plan

and a raised passing standard for the licensure examination have necessitated faculty to reexamine the curricula and implement strategies to promote success of their students.

One urban state university's baccalaureate nursing program, which included both regular and accelerated progression students, noted an ongoing problem with the success rate of first-time test-takers of the NCLEX-RN. The purpose of this research project was to examine the effectiveness of recent strategies implemented to improve the pass rates of the regular progression students taking the licensure exam for the first time.

Background and Literature Review

A review of the literature determined that student preparation for safe, entry-level practice and successful performance on the NCLEX-RN are of concern for nursing programs. There are extensive studies on predictive indicators for success on the NCLEX-RN, but only a few studies have evaluated strategies, such as using an outside vendor's standardized testing and remediation package during the nursing program to promote successful performance on the NCLEX-RN.

Academic and non-academic factors were identified as predictors for the success of graduates on the NCLEX-RN. Academic factors affecting passing rates included mean grade point averages (GPA), nursing course grades, exit examinations, and performance on comprehensive content and predictor tests during the curriculum, and structured review courses (Crow, Handley, Morrison, & Shelton, 2004; Frith, Sewall, & Clark, 2005/2008; Haas, Nugent, & Rule, 2004; Norton et al., 2006; Sayles, Shelton, & Powell, 2003; Seldomridge & DiBartolo, 2004; Stark, Feikema, & Wyngarden, 2002; Uyehara, Magnussen, Itano, & Zhang, 2007; and Waterhouse & Beeman, 2003).

Seldomridge & DiBartolo (2004) suggested that schools of nursing should

consider the overall grades in science courses as criteria for admission to nursing

programs. Others found that the identification and intervention for students-at-risk, as

well as early remediation, benefited success (Davenport, 2007; Haas et al., 2004;

Seldomridge & DiBartolo, 2004). One national study identified specific program

requirements and interventions that ensure success on the NCLEX-RN among Bachelor

of Science in Nursing (BSN) graduates, and tried to determine the best predictors for

NCLEX-RN success used by BSN nursing programs (Crow et al., 2004). They found that

the only significant intervention identified to promote success on NCLEX-RN was the

use of a commercial live review class for the NCLEX-RN (Crow et al.).

Non-academic factors influencing NCLEX-RN performance included linguistics,

self-esteem, test anxiety, emotional distress, family demands, and fatigue (Beeman &

Waterhouse, 2003; Crow et al., 2004; Frith et al., 2005/2008; Sayles et al., 2003; Stark et

al., 2002; Waterhouse & Beeman, 2003). Other factors included the number of hours that

students worked per week, and the amount of time between graduation and taking the

NCLEX-RN (BRN, 2000; Jacobs & Koehn, 2006).

The changes in NCLEX-RN passing standards and test plans have influenced the

successful performance of first-time test-takers. For registered nurses (RNs), the National

Council of State Boards of Nursing (NCSBN) conducts job analyses every three years to

evaluate current nurse competencies. Recent job analyses concluded that beginning

nurses are expected to perform at increasingly higher levels of competencies (NCSBN,

2007). The NCSBN board of directors coordinates the job analyses with the test plan

content evaluation (NCSBN). The last revision of the NCLEX-RN test plan was in 2004

(NCSBN). Following their analyses reviews, the NCSBN raised the passing standard on the NCLEX-RN examination for three of the four cycles (1998, 2004, and 2007).

Reviews of the NCLEX-RN pass rates for first-time test-takers of baccalaureate candidates from 1994 to the present revealed that the pass rates continue to be below the 1990-1993 pass rates (Figure 1). The decrease in pass rates of the NCLEX-RN was related to changes in the NCLEX-RN exam and the raised passing standard (Bonis et al., 2007; NCSBN, 2007). Nursing students have traditionally prepared for the NCLEX-RN using the same test preparation strategies that were used in school, such as memorization or recall, but students now require different testing preparation methods because the licensure examination tests the students' use of critical thinking skills (Davenport, 2007; Frith et al., 2005/2008). Davenport recommended that nursing programs begin students' preparation for the NCLEX-RN at the beginning of nursing courses.

After the introduction of computerized adaptive testing (CAT) in the NCLEX-RN, many nursing schools adopted computerized testing as a formative testing modality instead of using paper and pencil tests. Computerized testing programs provide students with immediate feedback, indicating their potential for success or failure in the NCLEX-RN examination (Holstein, Zangrelli, & Taboas, 2006). Nursing programs that implemented standardized computer testing in early nursing courses, including content mastery examinations, contributed to successful performance on the NCLEX-RN (Davenport, 2007). Student's experience and familiarity with computerized testing resulted in positive NCLEX-RN outcomes (Bonis et al., 2007; Waterhouse & Beeman, 2003).

In an effort to improve the pass rates for first-time test-takers of the NCLEX-RN, the California Board of Registered Nursing's (BRN) task force recommended several interventions which included participation in assessment tests during the program, the use of NCLEX-RN review materials, the need to familiarize students and faculties with computerized testing, and an increased emphasis on application, prioritizing, and critical thinking in developing test questions (BRN, 2000; Jacobs & Koehn, 2006; Richards & Stone, 2008). When schools of nursing implement commercially prepared comprehensive testing and remediation packages, faculty and students must understand its importance. Components of the package must be incorporated throughout the curriculum.

Theoretical Perspective/Conceptual Framework

The theoretical framework chosen to guide this research was based on Roger's (1995) innovation diffusion theory. Roger's model looks at the progressive stages used in adopting change, and considers both the individual's background and environment. Diffusion is the process by which an innovation is communicated over a period of time among members of a social system (School of Nursing). An innovation is an idea or practice that is perceived as new by an individual. Innovation consists of four stages: invention, diffusion through the social system, time, and consequences (Rogers, 1995). Rogers (1995) proposes that adopters can be categorized as innovators, early adopters, early majority, late majority, and laggards. The basic tenet of this model is that it takes time for an innovation to become self-sustaining and very few adopt an innovation initially. Innovation spreads slowly at first, but as more and more individuals adopt the innovation, it reaches saturation and will likely be self-sustaining. Each adopter's

willingness and ability to adopt change is dependent on their awareness, interest, evaluation, and trial before the adoption is complete.

Roger's theory can be applied in nursing education, practice, and management. There were many different changes in the NCLEX-RN examination over the last several decades. The introduction of CAT NCLEX-RN exams, raised passing standards, and changes in the NCLEX-RN test plan were related to lower pass rates. School curriculum changes, rigorous admission criteria, and testing packages can also affect students' rate of adoption of the interventions, and NCLEX-RN success. Nursing faculty can act as change agents to facilitate and sustain the adoption of strategies to enhance NCLEX-RN success.

Research Questions

Three questions guided the research project: (1) What was the trend of the pass rates for first time test-takers of the NCLEX-RN exam? (2) What strategies have been implemented at the university over the last five years? (3) How have the adopted strategies affected the NCLEX-RN pass rates?

Methodology

After obtaining Institutional Review Board (IRB) approval from the university, a retrospective record review was performed at one university's School of Nursing baccalaureate program. The project evaluated the effectiveness of implemented strategies on the success of students passing NCLEX-RN exam over the last five years. Success was measured as a percentage of students that passed the NCLEX-RN examination as first-time test-takers.

Description of Interventions

The School of Nursing sought and was granted impaction status. This term is used when a program, unable to accommodate all students, can add additional stringent criteria for admission to the major.

Four testing programs were introduced to assist students in their preparation for the NCLEX-RN: the writing skills test (WST) administered through the university, the Test of Essential Academic Skills (TEAS), the Kaplan (Kaplan, 2009) review course and the Assessment Technologies Institute (ATI) testing package which included a comprehensive assessment and review program (CARP). The WST is a written exam to ensure that students have a basic command of writing. Students are required to pass this exam before admission to the nursing program.

The TEAS exam is used to predict those candidates with the highest likelihood of academic success in nursing school (ATI, 2009). The TEAS consists of four high school level content areas: math, reading, English, and science. The reporting system for this examination includes separate content and a composite score. This school used the composite score.

The ATI testing package materials include modules, content mastery exams, and a RN predictor examination. The modules contain case studies and critical thinking exercises in all content areas including Pharmacology, Fundamentals, Adult Medical/Surgical, Maternal Newborn, Nursing Care of Children, Mental Health Nursing, and Community Health Care Nursing. The ATI RN predictor exam assesses the students' readiness and probability of success on the NCLEX-RN exam (ATI, 2009).

The Kaplan NCLEX-RN preparation program gives strategies and tools to enhance student success on the NCLEX-RN exam. This program provides 30 hours of class time, an online study center that includes a test-taking workshop, a strategy seminar, video-streamed review of class questions and frequently tested nursing content, a course book, and three months access to Kaplan online resources (Kaplan, 2009).

Multiple changes of students' progression policies in the School of Nursing were implemented during the course of this study. For example, students were allowed to repeat a nursing course only once and if they failed two nursing courses in one semester they were disqualified from the major.

Subjects

The subjects for this study were regular progression undergraduate nursing students at a state university who completed NCLEX-RN testing during the period from January 2004 through December 2008. These students were from culturally diverse backgrounds and aged between 18 and 55 years. Data were obtained from 680 students. Students in a grant-funded accelerated program were not part of this study.

Data Collection and Analyses

Data were collected from existing records at the university's School of Nursing. Data were reviewed for a five-year period starting from January 2004-December 2008. Only the number of students taking the NCLEX-RN, and the percentage of first-time test-takers that passed the NCLEX-RN were recorded. No individual student information such as names or identifiers were on the retrospective chart reviews, so personal information was not accessed. School reports provided the strategies that the School of Nursing introduced to the nursing program over the past five years to promote NCLEX-RN

success for first-time test-takers. Interventional strategies utilized during the five-year period were documented. Data were analyzed using statistical methods to assess measures of central tendency and percentages.

Results

The pass rates for each academic semester fluctuated over time. The pass rates ranged from 69% to 81% (Table 1). The pass rates of first-time test-takers of the NCLEX-RN for this university were compared to the national NCLEX-RN pass rates for first-time test-takers of baccalaureate graduates (Figure 2). Although the university's pass rates are lower in all semesters, they show a similar corresponding pattern with the national pass rates. The largest difference in pass rates between this School of Nursing and other schools occurred in the Spring 2008 semester. Schools in the nation scored 20 percentage points higher than the School of Nursing. The smallest difference with 6 percentage points occurred in the Fall 2006 semester. The longest span of declining pass rates for the university began in the Fall 2006 semester and continued through the Spring 2008 semester.

Discussion

What was the trend of the pass rates and what strategies have been implemented at the university over the last five years?

The pass rates before the data collection period (from 2001-2004) ranged from 77%-85%, which was below the national averages of 85%-87% for the same testing periods. To enhance the pass rates for the NCLEX-RN, this university has introduced many changes to the nursing program over the course of the study period. The students taking the NLCEX-RN exam in 2004 were given a diagnostic ATI NCLEX-RN predictor

exam and were required to pass it above a set threshold prior to enrollment in their practicum (preceptorship) in the final semester. The passing threshold for this dagnostic exam has been raised since Fall 2004.

In Spring 2005, new admission criteria based on impaction were introduced. Impaction for this university means that there are many more student applicants in a major than enrollment spaces and all students cannot be accommodated. The program can add supplementary criteria for admission. The first round included to a minimum overall university grade point average (GPA) of 2.5 for the most recent 30 units of coursework (with no repeated courses). Students were required to have a minimum GPA of 2.75 for five pre-requisites: Anatomy, Physiology, Microbiology, College English, and Psychology. In addition, the Test of Essential Academic Skills (TEAS) and the Writing Skills Test (WST) had to be successfully completed.

In Fall 2006, Spring 2007, and Summer 2007, all final semester nursing students were offered the Kaplan review course for the NCLEX-RN exam at no cost to them, but it was not compulsory. In Spring 2007, ATI testing package was implemented for all first semester students. The content mastery books are required for each curriculum level. During this year, all nursing students were required to take the content mastery exams at the end of their respective classes. Dependent on students' attaining a benchmark in the content mastery exams, they were awarded points, which counted for up to 5% of the final grade in the respective courses.

Traditionally, the School of Nursing used only paper and pencil tests. Due to the lack of computer laboratories, testing alternated between paper and pencil and

computerized testing for ATI exams. The ATI computer testing offers students immediate feedback on their performance.

How have the adopted strategies affected the NCELX-RN pass rates?

There was a 10% increase in the passing rates for first-time test-takers of the NCLEX-RN exam at this School of Nursing from Spring 2006 (70%) to Fall 2006 (80%). One could relate the initial increase of the Fall 2006 NCLEX-RN pass rates to the Kaplan review courses. It is important to note that the Kaplan review course was offered to all last semester students but was not a requirement. Some students did not take the Kaplan review course. By Fall 2007, the pass rate had declined to 69%. The raised passing standard on the NCLEX-RN examination in 2007 may have contributed to the decreased percentage of successful passers.

The increased pass rate in Fall 2008 could be related to the stricter admission criteria in 2005 and the implementation of the ATI comprehensive testing package. One could infer that the higher admission standards may result in a higher passing rate for the first-time test-takers. One could anticipate an increased percentage of passers with future first-time test-takers of the NCLEX-RN with the additional stringent admission criteria of the School of Nursing in Fall 2008 and Spring 2009. A more stringent admission criteria and the initial implementation of a commercial testing package have shown some positive impact on the NCLEX-RN exam passing rates.

There are many confounding variables in this study. The financial or family obligations of students, an increase in part- time faculty, and use of commercialized tests may all affect the NCLEX-RN test results. A number of students have other responsibilities in addition to school. There are many students who work, and some are

single parents raising children, who must work and attend school at the same time. Other students must care for their parents. Thus, for many students it is difficult to find a balance between studies and family, and allocating sufficient time for studying can be hard to achieve. The demographics of this area are different from the national demographics. For some students English is their second language (ESL). Studying and writing in a new language adds many additional pressures for the student. An increased number of part-time faculty with varying levels of clinical teaching experiences were hired to accommodate the increased enrollments. These new faculty may have influenced student learning, for it was difficult to maintain consistency and therefore quality across multiple course sections. Some students may have used other commercialized NCLEX-RN review courses after graduation, which might influence the NCLEX-RN success rates.

Limitations

The results of this study are limited to one School of Nursing's results on the NCLEX-RN for first-time test-takers. It was also limited to one geographical location and may not be generalized to nursing programs nationwide. For this school, many changes have occurred to enhance their students' success for first-time test-takers. The commercial testing package was only partially implemented during the study. Full implementation of the ATI CARP will be reflective in the students taking the NCLEX-RN in 2009. It is difficult to isolate one intervention as a sole contributor to the success of students on the NCLEX-RN because each testing period had multiple interventions that might affect the NCLEX-RN outcomes for this School of Nursing.

Recommendations

The additional supplementary admission criteria and increased minimum score on the TEAS test may enhance the success of future first-time test-takers of the NCLEX-RN for this school of nursing. Increased exposure to computerized testing in the nursing program may also benefit students in preparation for the NCLEX-RN. Increased computer testing in the nursing program may decrease test anxiety for students, thus enhancing NCLEX-RN success (Davenport, 2007). Early initiation of a remediation program is also vital to student success in the nursing program.

Conclusions

This study may be useful to other Schools of Nursing to evaluate strategies to enhance their students' performance on the NCLEX-RN. The raised national passing standards of the NCLEX-RN implies that Schools of Nursing may need to re-examine their admission criteria, implement commercialized testing packages across the curriculum, and increase the exposure of their students to computerized testing in order to enhance students' performance of the NCLEX-RN exam. A thorough ongoing evaluation of a nursing program's curriculum and making appropriate adjustments are integral parts of preparing future students to be successful on the NCLEX-RN examination. It is also a requirement of State Boards of Nursing and national accrediting organizations that nursing programs continually evaluate their student's academic success. Passing the NCLEX-RN on the first attempt enables new graduates to become licensed and prepared to enter the workforce. High NCLEX-RN pass rates have the potential for timely graduation and a better-prepared RN workforce. Most importantly, the increase in

passing standards of the NCLEX-RN assures the public of more competent graduate

nurses, which ultimately enhances patient safety.

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simplified? *Nursing Education Perspectives, 24* (1), 35-39.

Table 1

School of Nursing NCLEX-RN Pass Rates for First-Time Test Takers (N=680)

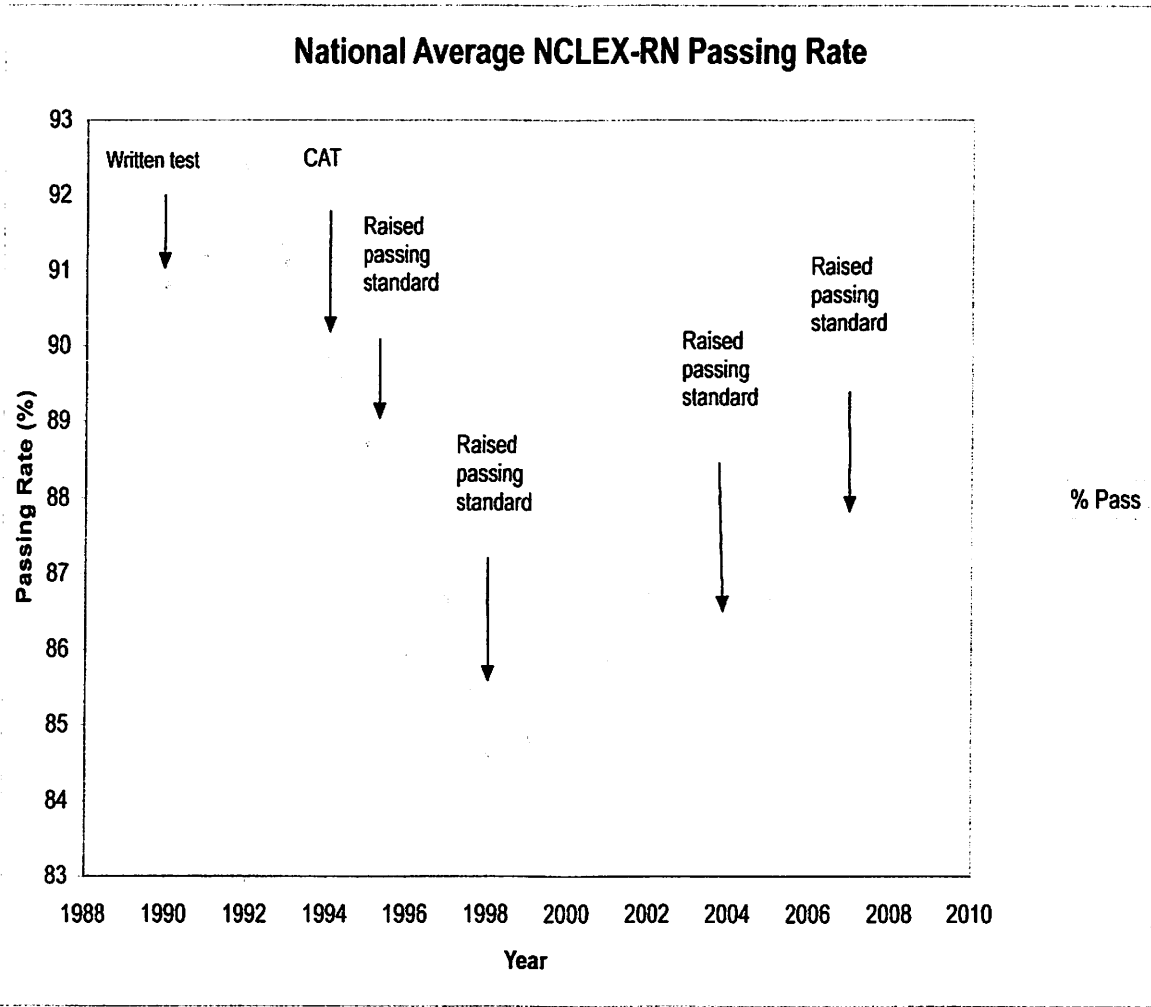| Test Periods	Total n	First-Time Test-Takers n	Pass Rates (%)
Spring 04	62	48	77
Fall 08	58	43	74
Spring 05	67	54	81
Fall 05	71	48	81
Spring 06	76	53	70
Fall 06	83	66	80
Spring 07	48	37	77
Fall 07	75	52	69
Spring 08	54	37	69
Fall 08	86	66	77

Figure 1 National Average NCLEX-RN Pass Rates from 1990-2008 (NCSBN, 1983-2008)
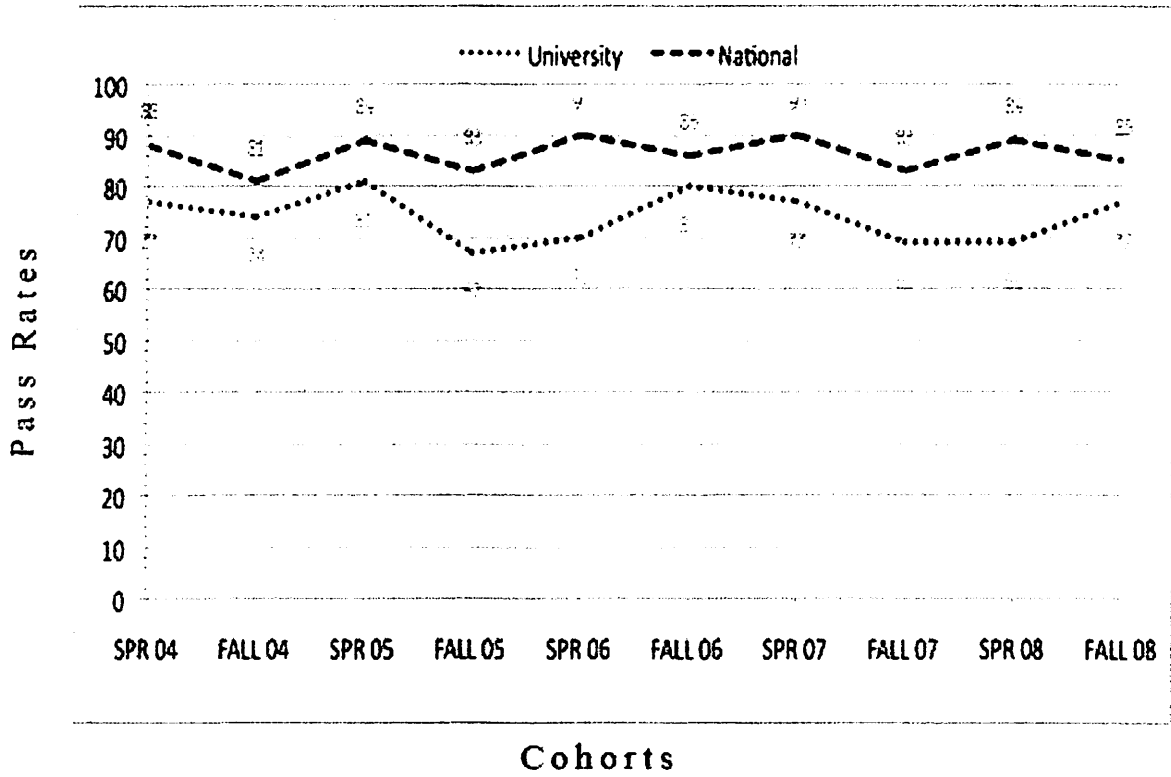
Figure 2 NCLEX-RN Pass Rates Comparing the University to National Test-Takers