

An Organized Pre-Entry Pathway to Prepare a Diverse Nursing Workforce

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ABSTRACT

Although many nursing programs are turning away qualified applicants, many are concerned with educating a diverse student population, as well as addressing community workforce needs. Many potential students who express an interest in a nursing career may be underprepared in math and science to enter a rigorous nursing program. This article describes the efforts of faculty at Kaua'i Community College to increase the successful entry of students underqualified in math into the nursing program through an organized pathway. Various learning strategies are presented, as well as lessons learned.

Although the American Association of Colleges of Nurses (2004) reported an increased enrollment in nursing programs across the United States and the turning away of qualified applicants, some nursing programs face difficulty recruiting qualified students from the local community (Amos, Green, & McMurry, 2003; Baillie, Allen, Coogan, Radley, & Turnbull, 2003). Unfortunately, many students who are underprepared are from minority groups and diverse ethnic backgrounds (Childs, Jones, Nugent, & Cook, 2004; Williams & Newman, 2003). Efforts to recruit and prepare these students help develop a diverse nursing workforce, as well as address local workforce needs (Newell-Withrow & Slusher, 2001). Shea-Lewis (2002) clearly articulated the value of developing a diverse nursing workforce:

Workforce diversity in a health services organization is of extreme importance. Diversity provides a more comprehensive range of knowledge and abilities. Diversity allows for better decision making based on different life experiences and perspectives. A diverse workforce can better provide health services to diverse populations. (p. 7)

This article describes the efforts of faculty to prepare underqualified students for entry into a 2-year associate degree nursing program located on the island of Kaua'i in Hawaii.

Program Description Background

Part of the mission of Kaua'i Community College's Career Ladder Nurs-

ing Program is to provide access for the people of Kaua'i to quality nursing education. Kaua'i is located in the Hawaiian chain in the Pacific Basin. It is a multicultural society with diverse health care values, practices, and needs. Part of the program philosophy is a belief in providing educational access to people from all ethnic backgrounds, as well as pre-entry preparation for those with special educational needs.

Faculty began to recognize that some interested applicants lacked skills in math, science, critical thinking, and technology. These students represented an at-risk local population, who, without intervention, might otherwise not be able to pursue careers in science and technology. Difficulties with math competence have been documented as problematic in the nursing student population (Brown, 2002).

In 2002, the nursing program received a 3-year grant from the Hawai'i EPSCoR (Experimental Program to Stimulate Competitive Research), a National Science Foundation program to address these issues. The aim of Hawai'i EPSCoR is ultimately to improve the research infrastructure in Hawaii. The grant provided funds for program development, including equipment purchase, and faculty stipends for curriculum development and revision. A project manager was hired to teach some of the nursing courses and provide case management for the cohort students. Students received stipend support, books, and supplies, as well as access to guaranteed classes at preferred class times. Tuition was not covered.

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A pilot project was undertaken with the goal of increasing these students' chance of success in the nursing program. This would help fill the need for well-prepared nurses who understand the local culture and who will live and work in the community. A multifaceted approach to addressing this problem was developed using a variety of learning strategies. A literature review pointed to developing a variety of innovative strategies to recruit and prepare students, particularly those from minority groups, for a career in nursing (Daumer & Britson, 2004; Heller & Nichols, 2001; Thompson, Young, Heller, & Farrow, 2001; Yates et al., 2003).

Curriculum

A core group of nursing and general education faculty was convened. The nursing faculty included the nursing program director, nursing counselor, project manager, and a nursing faculty member who served as curriculum designer. Threads of the curriculum were developed. The curriculum focused on communication, critical thinking, technology, and research. A full-time, 2-year, pre-entry curriculum called the Academy for Future Nurses was designed, which included developmental courses, prerequisite courses, and general education requirements for the nursing program. The program consisted of approximately 70 credits, 22 of which satisfied requirements within the nursing program. The **Table** describes the components of the specific nursing courses developed for this program and how these areas were threaded into the curriculum.

The program manager, a master's educated nursing faculty member, taught the Strategies for Success in Nursing series, while other nursing faculty taught the additional nursing courses. Faculty taught the specific components of the courses, such as how to scan photographs and use graphing calculators, which required them to not only learn how to use these applications but then develop the learning activities associated with them. General education faculty

redesigned their courses to emphasize health-related concepts.

Students

Deficiency in math scores on pre-admission testing was identified as the marker for entry into the program. A cohort of 25 students who had placed into the equivalent of first-year high school algebra (i.e., well below the criteria for entry into the nursing program) was selected each year.

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The first cohort began the 2-year, pre-entry program in fall 2003. Although the majority of students for the first two cohorts were recent high school graduates, they ranged in age from 17 to 36 (mean age = 22.32, median age = 20, mode age = 19). Eighty-eight percent of the students were from diverse ethnic backgrounds.

Students attended a 2-day seminar the week prior to the start of the fall semester of the first year to meet the faculty, learn about the program, and become familiar with resources and the campus. Activities included learning assessment and team-building strategies. Students were certified in cardiopulmonary resuscitation (CPR) and first aid. In the seminar during the first year, students met with current nursing students for advice; in subsequent seminars, new students

met with returning pre-entry students.

During the summer between the first and second years, students were provided with options for participating in a summer mentoring experience, in which they had an opportunity to work with health care providers in summer health programs for elementary or middle school children. Students could participate in either a 3-week-long summer health academy or, if students had limited time availability, a 3-day asthma camp.

Activities

Communication. Communication activities were spaced throughout the Strategies for Success in Nursing series. The first course began with written communication through a written, referenced academic paper. Students were required to meet with the campus writing tutor to develop their outlines and then their papers. Oral communication was stressed in the second course through health presentations and debates. Students proceeded to more public kinds of communication, such as producing health-related Web sites, audiovisual public service announcements, and research presentations. Grading rubrics were created for all communication learning activities. Within the summer mentoring experience, students addressed how they had practiced professional communication skills with the health care providers and campers.

Critical Thinking. Critical thinking and writing exercises were incorporated throughout the curriculum, with an emphasis on ethics. Students' critical thinking ability was assessed at the beginning and end of the 2-year curriculum, using the California Critical Thinking Skills Test (Insight Assessment, 2000).

Technology. The use of technology was incorporated throughout the curriculum. At the beginning and end of the program, students completed a self-reported technology inventory. Graphing calculators were purchased for all students and modules developed to help students learn how to use them. In the Strategies for Success in Nursing series, students learned

TABLE
Academy for Future Nurses Curriculum

Course (Description)	Focus	Learning Activities	Technology Involved
Strategies for Success in Nursing 1 (fall first year, 2 credits: lecture)	<ul style="list-style-type: none"> • Successful learning habits • Critical thinking skills • Written communication skills • Technology to support learning • Reading comprehension 	<ul style="list-style-type: none"> • Academic biology paper • Reading assignment • Critical-thinking activities • Keeping grades in database 	<ul style="list-style-type: none"> • Word processor • Computerized assessment • Database applications • Graphing calculator
Introduction to Health Careers (fall first year, 3 credits: 2 lecture, 1 laboratory)	<ul style="list-style-type: none"> • Health occupations • Basic skill set for health care providers 	<ul style="list-style-type: none"> • Service-learning • Smoking cessation certification 	<ul style="list-style-type: none"> • Presentation software
Strategies for Success in Nursing 2 (spring first year, 2 credits: lecture)	<ul style="list-style-type: none"> • Successful learning habits • Critical-thinking skills • Oral communication • Technology to support learning 	<ul style="list-style-type: none"> • Debate • Individual presentations 	<ul style="list-style-type: none"> • Presentation software • Database applications • Graphing calculator
Strategies for Success in Nursing 3 (fall second year, 2 credits: lecture)	<ul style="list-style-type: none"> • Successful teamwork strategies • Audiovisual communication 	<ul style="list-style-type: none"> • Public service announcements 	<ul style="list-style-type: none"> • Video/digital camera • Audiovisual software
Technology and Health Care (fall second year, 3 credits: lecture)	<ul style="list-style-type: none"> • Health applications for technology • Ethics and confidentiality 	<ul style="list-style-type: none"> • Field trips • Web site development 	<ul style="list-style-type: none"> • Web site development software • Digital camera
Strategies for Success in Nursing 4 (spring second year, 2 credits: lecture)	<ul style="list-style-type: none"> • Research • Problem solving • Nursing process 	<ul style="list-style-type: none"> • Data collection and interpretation • Research project and presentation 	<ul style="list-style-type: none"> • Statistical software

how to use spreadsheets to track their progress in courses, as well as to graph and chart relationships between variables. Critical thinking exercises were also linked to the use of technology. For example, after students obtained the data and graphed them, they interpreted, predicted, and discussed the limitations of those data. Students learned how to scan photographs and insert graphic images into Web pages and software presentation packages. They also used an audiovisual software program to edit and produce audiovisual public service announcements.

Research. Because Hawai'i EPSCoR's ultimate goal is to improve the infrastructure of research in Hawaii, the Strategies for Success in Nursing series culminated in a small health research project that included proposal development, data collection and analysis using a statistical soft-

ware package, and presentation of findings during a judged research fair. Many of the students had completed science research projects in high school, and this research project was adapted to health-related research on that basis. This gave students an opportunity to improve their communication skills, as all questionnaires had to be personally administered and research findings verbally presented at the research fair. Students' critical-thinking skills were also refined through data analysis and interpretation, as well as through applying the knowledge learned in the co-requisite statistics course they take.

Learning Strategies

Real-Life, Current Examples. Critical-thinking exercises, such as debates and writing assignments, were tailored around current health care issues found in the general news

media and periodical literature. Educational health-related films on current issues and trends in health care were purchased and educational activities developed to stimulate critical thinking. Examples of topics included alternative medicine, ethical issues (e.g., government involvement with individual rights for health care determination), current problems with pharmaceutical regulation, and people's experiences with diseases. Sometimes, in examining a current issue, students had reason to explore historical aspects. For example, after viewing a film on a comparison of influenza today with the 1918 pandemic, students explored other infectious diseases, such as the 19th century measles epidemic in Hawaii and the 20th century polio epidemic in the United States.

Positive Reinforcement. Students received positive reinforcement

through gifts, prizes, and stipends that offset the cost of books and supplies. Students received stipends each semester and if they participated in the summer mentoring experience. All gifts and prizes were related to academics or nursing. During the 2-day seminar prior to entering the program, students participated in an on-campus scavenger hunt to find different resources available to them. At each site, students received a small gift (e.g., a floppy disk, bookmark, academic calendar). At the end of the 2-day seminar, they received a wrapped gift: a medical dictionary. Prizes for the research fair, held just prior to entry into the nursing program, consisted of stethoscopes, pocket organizers, penlights, and bandage scissors.

Occupational Socialization. Students were socialized into nursing and health care immediately. They received training in CPR, first aid, and counseling for smoking cessation. The Introduction to Health Careers course had a serving-learning component, in which students were placed in a community health agency. The summer mentoring experience also gave students opportunities to provide health education and work alongside health care professionals. Students were invited to become members, as well as elected board members, of the Student Nursing Club.

Case Management. Consistent faculty were identified and recruited to teach the courses within the academy throughout the term of the pilot project. One nursing faculty member taught the Strategies for Success in Nursing series and acted as case manager with the nursing counselor for students. All faculty met every 2 weeks throughout the academic year to discuss the students and program and to make changes accordingly.

Academic Support. Both peer and adult tutors were available for the math and science courses. Two regularly scheduled, 1-hour sessions per week were available for algebra, chemistry, and anatomy and physiology. At-risk students were contracted to attend tutoring sessions. Sessions with the learning center faculty were incorporated into the homework as-

signments, and part of the grade requirements for the first academic paper were documentation of students meeting with the writing tutor for outline development and draft revision.

Contextual Learning. Faculty for the math and science courses, in conjunction with the nursing curriculum faculty, redesigned the course material to incorporate examples from nursing and health care. For example, in the

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Elementary Algebra I class, students learned about calculating intake and output and determining water gain or loss. In the ratio and proportion class, students were given case studies about administering over-the-counter medicine to their children and had to convert dosages across different measurement systems.

Successful Life and Study Skills. To help students who were having personal difficulties in areas such as time management, finances, personal relationships, and parenting responsibilities, the On Course (2000) curriculum and textbook (Downing, 2005) were integrated into the Strategies for Success in Nursing 1 and 2 courses. On Course helps students determine the choices they must make to succeed and is designed to empower students to experience greater self-awareness, self-management, interdependence, creative and critical thinking, emotional intelligence, and lifelong learning skills. Essential study skills, including reading,

taking notes, studying, memorizing, taking tests, writing, and research, are covered. Reading assignments, guided journal writing, quizzes, case studies in critical thinking, collaborative classroom activities, and modeling by instructors were used to help students make choices that led them toward, rather than away from, their desired outcomes and experiences.

Workplace Readiness Skills. Specific components of KeyTrain® (SAI Interactive, Inc., 2003) were used in different nursing courses. KeyTrain is a self-paced, computer-based, instructional system that provides an assessment and targeted skill level based on occupational job profiles. Particular components used included teamwork skills and concepts of electricity.

Findings and Lessons Learned

Although the Academy for Future Nurses is still in the pilot phase and evaluative data are still being collected, some beginning findings are presented in this article. Although students in Cohorts 1 and 2 were not statistically different in admission reading, writing, math, or critical-thinking scores, 48% of Cohort 1 successfully finished the first semester of the Academy, whereas 84% of Cohort 2 successfully finished the first semester. This 37% increase in success rate was significant at $p < 0.006$. On average, Cohort 2 received a better grade point average (GPA) (3.16) than did Cohort 1 (2.1) for the fall semester of the first year ($p < 0.0001$). Faculty attributed this success to incorporation of the On Course curriculum. For Cohort 1, this curriculum was not begun until the spring semester of the first year, whereas it began in the fall semester of the first year for Cohort 2. The major reason for attrition was academic failure due to lack of attendance and completion of course requirements; other reasons were identification during case management that some students preferred another major and student relocation.

One valuable lesson learned was to tie the stipends to student progress throughout the semester. During the

first year, stipends were delivered to students in a lump sum at the end of each semester if they successfully completed the semester. After faculty evaluation, during the second year, stipends were delivered in three payments during the course semester, if students were making satisfactory progress in each class. Thus, students received better feedback on their progress. Some students did not receive the first stipend of the semester because of unsatisfactory performance but were able to obtain it when they demonstrated sufficient progress.

Critical-thinking pretest and post-test results are available for Cohort 1, as measured by the California Critical Thinking Skills Test (Insight Assessment, 2000). Mean critical-thinking scores improved 28%, from a mean raw score of 11.7 measured before beginning the program to a mean raw score of 15 at program completion (significant at $p < 0.016$). Cohorts 1 and 2 were admitted to the nursing program in fall 2005 and 2006, respectively. If students complete the Academy for Future Nurses curriculum with a GPA of 2.75, they are admitted to the nursing program. General admission requirements of satisfactory placement on the National League for Nursing's (n.d.) Pre-Admission Examination-RN were not required of these students, but they were tested to see how they compared with other students seeking admission. Eighty-eight percent of Cohort 1 received passing scores on the National League for Nursing's Pre-Admission Examination-RN, compared with 55% of all other applicants.

Student Responses

Student comments obtained after the first year that reflected the strength of the program were related to the support and encouragement they received from their peers and faculty. Students liked that the faculty were "all on the same page"

and that what they learned in one class related to what they learned in another. As one student said, "What you learn in math relates to what you learn in chemistry... What we learn in biology relates to medical technology." Students enjoyed that all of the courses were tailored to nursing and that they had the opportunity to volunteer during service-learning. Most important, students appreciated being given the opportunity to be provided with a path to enter the nursing program.

Although some students believed that 2 years was too long and that a 1-year curriculum would be sufficient, others appreciated the 2-year length because they believed it took time to master the skills. It is a fact that most nursing students do not enter the program immediately. A recent poll of 14 current nursing students, who were not part of this project, revealed that students were in college an average of 2½ years before entering the nursing program.

Summary

Although still in its pilot phase, the Academy for Future Nurses is an organized, specific pre-entry pathway for nursing students who are academically at risk. Enhancing their ability to be successful nurses can help promote a diverse nursing workforce, which is key to meeting the needs of a diverse health care population.

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