

COLLABORATION/PARTNERSHIPS

An Application of Multidisciplinary Education to a Campus-Community Partnership to Reduce Motor Vehicle Accidents

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ABSTRACT Objective: *A collaborative campus-community partnership program provided the framework for an intervention to reduce motor vehicle accident fatalities along a rural Appalachian highway. Students from public health, nursing and medicine worked with community members to identify the problem and plan the strategy to address it.*

Methods: *An inquiry-based learning model proved to be an appropriate approach to engage student teams with community leaders in identifying and resolving health needs. Inquiry-based strategies place students in guided learning situations where their investigations lead to working solutions. The inquiry-based model matched the curricular objectives of the Community Partnership Program (CPP) more closely than the classroom oriented problem-based learning approach.*

Implementation: *In the spring of 1994, students, along with citizens and officials of a rural Appalachian county, initiated a community-based prevention project focused on reducing deaths from motor vehicle accidents employing the principles of an inquiry-based learning model.*

Discussion: *This project effectively demonstrates the role that students can play in mobilizing diverse elements of the community to address identified health and safety concerns. It provides an illustration that a longitudinal, community-based, service-learning approach to health professions education is beneficial to both student learners and communities.*

Conclusions: *Through the use of inquiry-based learning methods, students gained real life experience in applied principles of health statistics, epidemiology, community organization, health risk communication, health education planning and program*

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implementation. Outcomes of the project included a measurable reduction in automobile-related fatalities and the initiation by the state department of transportation of a series of investigations expected to pave the way for physical improvements to the roadway.

KEYWORDS *Campus-community partnership, community partnership, health professions education, highway safety, multidisciplinary education.*

Introduction

East Tennessee State University's (ETSU) Community Partnership Program (CPP) is a multidisciplinary health professions education program built on a campus-community partnership model (Wachs *et al.*, 1998). It involves faculty and students from the College of Medicine, College of Public Health and the College of Nursing. The program began in 1991 as one of seven demonstration program in the United States funded by the W.K. Kellogg Foundation. The stimulus for the foundation initiative came in response to several national and international commission reports and position papers (Institute of Medicine, 1988; Shugars *et al.*, 1991; Council on Graduate Medical Education, 1994; American Association of Colleges of Nursing, 1995).

A consistent recommendation from these reports was the integration of additional interprofessional training opportunities in education for health professions to facilitate a collaborative approach to health care practice. Other major recommendations encouraged the development of curricula emphasizing critical thinking and problem-solving within a community-based service-learning partnership.

The recommended changes were expected to produce a new generation of health professionals with both multidisciplinary and population-based skills. These practitioners would expand the boundaries of the traditional patient-centered medical model to one of community-centered health care.

Methods

The CPP adopted an inquiry-based learning methodology (Boud & Feletti, 1997) set in a service-learning framework (Seifer, 1998). Originally designed to introduce students to the processes of scientific inquiry, inquiry-based learning seeks to develop cognitive abilities for solving problems, whether in the laboratory or real life (Inouye & Flannelly, 1998; Magnussen *et al.*, 2000). Placed within a multidisciplinary curriculum, inquiry-based learning promotes cooperative thinking and professional interdependence in problem solving through collaborative community-based exercises and experiences.

The ultimate purpose of the inquiry-based multidisciplinary approach in the CPP is to teach students in the health professions the skill of examining substantive issues from diverse viewpoints to effect a more comprehensive solution. Adding a community-partnered service-learning component provides a mechanism for channelling students through real life learning experiences under the guidance of experienced community leaders and academic faculty (Connors *et al.*, 1996).

An essential component of the CPP was the establishment of mutually beneficial working relationships between the university and the communities in its service area. Two counties were specifically identified as having the most urgent needs due to: high rates of unemployment and poverty; elevated rates of common mortalities, such as heart disease, cancer, and stroke; and designation as areas with a shortage of health professionals (Florence & Goodrow, 1996).

University faculty and community members worked collaboratively to design inquiry-based teaching and learning strategies correlated to community health concerns and needs. Elements of theory and practice from the existing curricula of the participating colleges were included, as well as new content on interdisciplinary team building, group process, cooperative leadership and collective problem solving (Goodrow *et al.*, 2001). All teaching and learning exercises were interactive and community-based, maximizing collaboration between faculty, students, and community members.

The inquiry-based learning model proved to be an appropriate approach to engage student teams with community leaders in identifying and resolving health needs. The use of inquiry-based education in the health sciences began as an outgrowth of problem-based learning theory (Des Marchais & Dumas, 1990; Boud & Feletti, 1997). Problem-based learning typically utilizes a classroom setting where teams of student learners acquire critical knowledge, develop group process skills and increase problem solving proficiency (Barrow & Kelson, 1993). Students are presented with a problem (case, videotape, or database, etc.), and faculty mentors assist students with a self-directed focused investigation around the learning issues. Inquiry-based strategies place students in guided community-based learning situations where their investigations lead to working solutions. The inquiry-based pedagogy matched the curricular objectives of the CPP more closely than the problem-based approach. It was more flexible in the choice of learning strategies, the number of students that could be accommodated and the application of multidisciplinary collaborative activities in community-based sites (Feletti, 1993). A total of 48 students per year are enrolled in the CPP with 16 students from each of the three disciplines forming a multidisciplinary cohort.

CPP student learners were supported by instruction from an interdisciplinary faculty team (representing each of the three schools), and from members of

the community. The variety and authenticity of these experiences provided an effective means to prepare students for comparable situations they will face after graduation (Goodrow *et al.*, 1996; Virgin & Goodrow, 1997).

The partnerships between the university and the participating communities are essential elements. Through these partnerships, each community is empowered to assume a proactive and equal role in the formation and operation of each health intervention. Community leaders identify and recruit area residents who participate as colleagues with program faculty. A collaboration of expertise formulated the program's original instructional objectives and continues to help identify related learning experiences to reinforce them (Goodrow *et al.*, 1996; Goodrow & Virgin, 1996).

Curricular components are taught using teaching and learning methodologies that reflect the health assets and liabilities of each community. Students begin by examining local age adjusted morbidity and mortality data and compare these to regional and national indicators. These data are compared to community priorities, as determined by various local committees, study groups and agencies.

Once a problem is identified, students apply elements of community organization (Bracht *et al.*, 1999) in an effort to mobilize the community. Students identify and engage community leaders and other change agents and assist in the development of local health coalitions to address the target issues. The selection of a community-supported intervention for a health issue is made through a collaborative process involving review of the pertinent literature, identification of local resources and consultation with local health care professionals.

The authors will present an example of one model intervention application of the campus-community partnership. It will illustrate how inquiry-based, multidisciplinary, service-learning strategies can serve as effective means for learning principles of community health promotion, while helping a community to directly address a critical health issue.

Implementation

CPP students, along with local citizens and community leaders, initiated a community-based prevention project focused on reducing deaths from motor vehicle accidents. The population at risk were vehicular travelers on one of the most dangerous stretches of highway in the state. It was hoped that the outcomes of planned intervention would join a history of public health successes in the area of motor vehicle safety (Morbidity & Mortality Weekly Report, 1999).

The project began with a community assessment conducted as a multidisciplinary inquiry-based class activity. Students found that the death

rate for motor vehicle accidents was significantly higher in the target county than in each of the contiguous counties and in the region as a whole. Upon compiling age and sex specific rates, an epidemiological profile emerged. Most of the elevated risks for motor vehicle accidents, injuries, and fatalities were among teenage male drivers not wearing seatbelts. This preventable pattern mirrored what has been called a rural motor vehicle accident epidemic (Edney *et al.*, 1993). Nearly half (46.2%) of all the motor vehicular fatalities in the county were teenagers (Figure 1), with three times as many teenage males killed as females. Over three-fourths of the fatalities occurred among drivers or passengers not wearing seatbelts. The lack of seatbelt use by adolescent drivers, especially males, has been a consistent risk factor reported by the Youth Risk Behavior Survey from 1991 to 1997 (Morbidity & Mortality Weekly Report Surveillance Summary, 2000).

Analysing these and other data gave CPP student teams an opportunity to apply epidemiological and biostatistical concepts within the context of a real community problem. A tragic event occurred during the initial year that reinforced the reality that this was not just an academic exercise and the victims were more than just statistical summaries in state reports. In a single day, five traffic related deaths occurred in the county. Three of these happened along one state highway

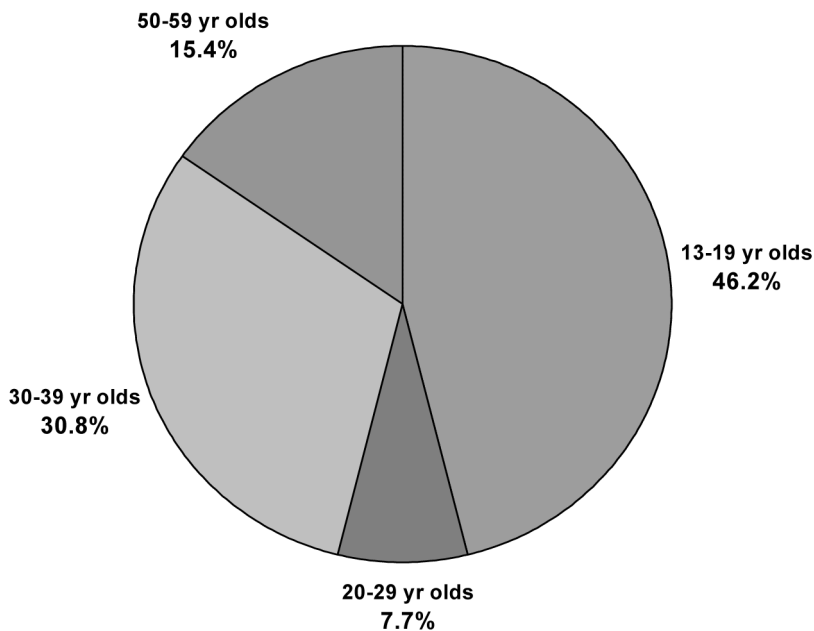


Figure 1. County motor vehicle accident fatalities by age, 1991–1997.

with a long history of traffic accidents, and all involved teenage male drivers. The resultant local publicity and public outcry galvanized the community in support of the next phase of what was to become a major community-based intervention.

Working closely with the Department of Transportation, the State Police, and local community leaders, student teams began to look more closely at the problem in the summer of 1995. Each team, consisting of a senior public health education student, a 3rd year medical student, a senior nursing student and a sophomore premedical student, began an in-depth analysis. The students interviewed key informants and decision makers from the area. They tabulated results from individual traffic accident reports provided by the State Police, all in an effort to detail the crash history of the section of the highway that posed the greatest risk. At the same time, they began an extensive review of published research and reports describing strategies effective in reducing motor vehicle accident rates.

Law enforcement officers, emergency medical personnel, driver education instructors, school district administrators, area primary care practitioners, health educators and local and state government leaders were queried through the use of focused interviews. From these contacts, a *community action coalition* was formed to address issues related to highway safety and motor vehicle accident prevention.

An analysis of data over a three-year period (1992–1994) indicated that out of a total of 1181 motor vehicle accidents occurring in the county, 140 (12%) happened on the targeted 12-mile section of road. This was more than any other comparable stretch of roadway in the county and resulted in 107 injuries and 13 deaths. The average number of deaths on this highway section exceeded the average of other county roads by more than 30 times. Students collected additional data about contextual factors associated with the accidents, such as time of day, day of week, road conditions, road alignment and terrain, weather influences, traffic patterns, geographic location and driver factors such as age, sex, years of driving experience, speed of travel, passing lane violations, or alcohol use.

Following their assessment, student teams assisted the community coalition in drawing regional and statewide media attention to the high-risk roadway. This helped the coalition expand interest in the project to a wider circle of influence, including state highway officials and state legislators. As a direct result of coalition efforts, regional health care providers, law enforcement agencies, highway safety departments and emergency response services established formal and informal agreements with each other to better coordinate efforts to address the problem.

Student multidisciplinary teams, faculty and community members worked jointly over the next several months to develop a comprehensive plan to reduce risk of injury and death. Over the ensuing 3 years and

subsequent to the ending of the project (1996–1998), restrictions in state funding reduced hopes of major highway realignments and corrective reconstruction. In spite of this, many steps continued to be taken to further reduce risk along the highway, including: student teams developing an educational campaign focusing on teenage male drivers; conducting a driver safety fair; and organizing surveillance by Neighborhood Watch programs which resulted in an increase of law enforcement patrols. Students wrote featured articles about the highway that appeared in local newspapers. These efforts contributed to an increased community awareness of the roadway safety issues and the need for remediation (Figure 2).

By 1999 the state funding situation changed, and priority was again given to provide a more lasting solution to the highway. In February 2000 the Department of Transportation engaged an independent contractor to conduct a major study to determine traffic patterns, usage and critical engineering concerns, including road alignment. Other studies have begun with recommendations resulting in sweeping improvements on the once deadly roadway.

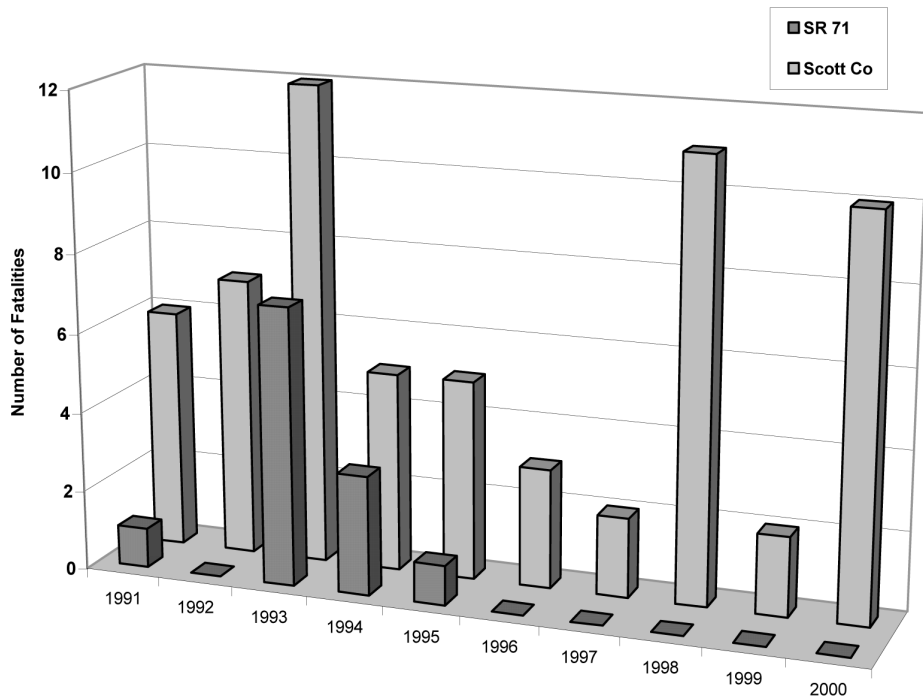


Figure 2. Comparison of motor vehicle accident fatalities state route 71 vs Scott County, 1991–2000.

Discussion

ETSU's Community Partnership Program provided students in multidisciplinary health professions with hands-on learning experience in real life situations in rural, underserved communities. As a result of the motor vehicle accident prevention project, citizens of one rural county developed expertise in both community empowerment and the planning and implementation of intervention strategies. Student teams also developed a capacity to generate and sustain future interventions by learning skills related to coalition building, media and political advocacy and resource development.

The project demonstrated the inquiry-based, service-learning philosophy of the CPP. Inquiry-based learning proved to be advantageous in both guiding the epidemiologic investigation and in the implementation of a focused community intervention. Multidisciplinary student efforts provided a fresh focus on priorities and the impetus needed to initiate planned community approaches for health issues. The illustration of highway fatalities is just one of many examples emphasizing community-based learning. Other student-community project topics have included childhood obesity, diabetic patient management, smoking cessation, prenatal care and agricultural safety.

This project demonstrates the role that students in health professions can play in mobilizing local citizens and community agencies to address health concerns. It adds justification to the placement of students in real life, longitudinal, community-based learning experiences as an adjunct to classroom instruction. It provides compelling evidence that a service-learning approach to public health and community medicine is a viable alternative to traditional classroom instruction.

Implementation of the CPP involved major curricular changes in health professions education at ETSU. Academic agendas, turf issues, student schedules and the details of organization and administration had to be resolved. Student outcomes have been monitored during the 12-year history of the program. Students in all three disciplines have performed as well or better than their peers on professional examinations, licensure requirements and residency placements (Goodrow *et al.*, 2001).

The university recently completed a longitudinal study of CPP graduates to determine if the CCP had resulted in health care professionals who chose employment in rural settings and incorporated a multidisciplinary approach within their practice. CPP graduates were matched with traditional program graduates for each of the three disciplines and evaluated on the basis of employment location, comfort in being a member of a multidisciplinary team and ability to utilize community resources. CPP graduates were significantly more likely to work in rural, underserved communities and function as members of numerous multidisciplinary teams. CPP graduates also reported more familiarity with community decision-making and resource availability.

The university has increasingly institutionalized elements of the CPP into the respective curricula of the three colleges. Education in multidisciplinary health professions at the ETSU campus now includes courses in communication, health assessment, epidemiology and community health. Multidisciplinary, community-based learning has become one of the major philosophical tenets of the university (Brown *et al.*, 2003).

Conclusions

In spite of the curricular and logistical challenges, educators in health professions and community health practitioners should consider campus-community partnerships as a means to share scarce resources for the combined goals of service and learning. Goldman and Schmalz (2000) provide an overview of the benefits of such partnerships and an introduction on how to initiate them. Paradigm shifts and compromises will be necessary at the university, and accommodation and commitment will be required in the community, but the ultimate outcomes will more than justify the time and energy expended.

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