

**ASSESSMENT OF THE PENNSYLVANIA GOVERNOR'S SCHOOL FOR
HEALTHCARE: STUDENT KNOWLEDGE, ATTITUDES AND CAREER INTEREST**

by

Jennifer L. Sponsler

B.A., Anthropology, George Washington University, 2002

Submitted to the Graduate Faculty of
the Graduate School of Public Health in partial fulfillment
of the requirements for the degree of
Master of Public Health

University of Pittsburgh

2007

UNIVERSITY OF PITTSBURGH
GRADUATE SCHOOL OF PUBLIC HEALTH

This thesis was presented

by

Jennifer L. Sponsler

It was defended on

April 06, 2007

and approved by

Robert M. Goodman, PhD, MPH, MA, Professor and Chair, Department of Behavioral and Community Health Sciences, Graduate School of Public Health, University of Pittsburgh

Kenneth J. Jaros, PhD, Assistant Professor, Department of Behavioral and Community Health Sciences, Graduate School of Public Health, University of Pittsburgh

Joanne Nicoll, PhD, Associate Director for Instructional Design and Faculty Development, Center for Instructional Development and Distance Education, University of Pittsburgh

Thesis Director: Martha Ann Terry, PhD, MA, Senior Research Associate, Department of Behavioral and Community Health Sciences, Graduate School of Public Health, University of Pittsburgh

Copyright © by Jennifer L. Sponsler

2007

ASSESSMENT OF THE PENNSYLVANIA GOVERNOR'S SCHOOL FOR HEALTHCARE: STUDENT KNOWLEDGE, ATTITUDES AND CAREER INTEREST

Jennifer L. Sponsler, MPH

University of Pittsburgh, 2007

There is an increased need for educational programs about health careers as evidence shows the number of American students pursuing advanced degrees in science and healthcare continues to decrease. The Pennsylvania Governor's School for Healthcare, a summer residential program for high school students, is designed to introduce participants to various health careers, teach students about the research process and the nature of scientific inquiry, facilitate project-based learning, refine critical thinking skills, and foster positive interactions with practicing physicians and other health professionals. Assessment instruments such as exit surveys and focus groups were developed and used to capture data on student satisfaction with the program, the influence of its curriculum on student knowledge, attitudes and awareness of various health careers and to what degree the program affected or changed student career interest. Results indicated that the majority of students felt the program increased their knowledge and awareness of health careers and influenced their future career choice in a health profession. Student participation in healthcare curriculum, activities and interactions with health professionals provided them with a positive hands-on experience. Overall, students were highly satisfied with the program. The Pennsylvania Governor's School for Healthcare significantly influenced the interest and future goals of its participants in their desire to pursue a career in healthcare. Research outcomes will be given to the Pennsylvania Governor's School for Healthcare as a program improvement tool for future programs. The relevance of public health in this thesis is to promote educational

programs about health related careers as a viable method of successfully initiating and/or maintaining a student's interest in the health professions.

TABLE OF CONTENTS

PREFACE.....	XI
1.0 INTRODUCTION.....	1
2.0 BACKGROUND ON HEALTH CAREER EDUCATION PROGRAMS.....	4
2.1 IMPORTANCE.....	4
2.2 STUDENT KNOWLEDGE, ATTITUDES AND BELIEFS.....	5
2.3 EXISTING PROGRAMS	7
2.4 PROGRAM DESCRIPTION	8
2.4.1 Admission.....	10
2.4.2 Mission and Goals.....	10
2.4.3 Curriculum, Faculty and Facilities	12
3.0 RESEARCH DESIGN	15
3.1 ASSESSMENT STRATEGIES	15
3.2 RESEARCH QUESTIONS.....	18
3.3 HYPOTHESIS	18
4.0 METHODS	19
4.1 STUDY POPULATION	19
4.2 SETTING.....	20
4.3 SURVEY	20

4.4	FOCUS GROUPS	21
4.5	DATA ANALYSIS.....	22
5.0	RESULTS	24
5.1	SURVEY.....	24
5.1.1	Program Satisfaction	24
5.1.2	Knowledge and Awareness	25
5.1.3	Career Interest Before and After Program.....	26
5.1.4	Career Intent.....	27
5.1.5	College and Major Intent.....	29
5.2	FOCUS GROUPS	30
5.2.1	Interest in Applying	30
5.2.2	Experiences that Influenced Health Career Interest.....	30
5.2.3	Career Intent.....	35
5.2.4	College and Major Intent.....	36
5.2.5	Program Improvement.....	36
6.0	DISCUSSION	39
6.1	STUDY LIMITATIONS	41
7.0	CONCLUSION.....	43
	APPENDIX A: COURSE SYLLABUS.....	44
	APPENDIX B: PGSHC STUDENT QUESTIONNAIRE	47
	BIBLIOGRAPHY.....	50

LIST OF TABLES

Table 1. PGSHC Daily Schedule	14
Table 2. Interest in specific health careers	29

LIST OF FIGURES

Figure 1. CIDDE Instructional Design Model.....	16
Figure 2. Example of coding process from focus group transcripts	23
Figure 3. Impact on knowledge and awareness about health careers	25
Figure 4. Interest in a health career BEFORE program.....	26
Figure 5. Interest in a health career AFTER program	27
Figure 6. Influence on future health career choice	28

PREFACE

Thank you to the many people whose expertise, guidance and support helped me over the course of this project. I'm especially thankful to Drs. Martha Ann Terry, Kenneth Jaros, Joanne Nicoll and Robert Goodman who formed my thesis committee. I appreciate all of the time you spent reviewing my work and providing me with thoughtful feedback. Thank you, Karen Narkevic, for also being instrumental in the preparation of this thesis. I am so grateful for your prompt responses to my many emails and calls about PGSHC. Thank you, Melinda Litzinger, for transcribing all of my focus group. Finally, thank you to my friends and family especially my mom, Debra Sponsler, my dad, Dennis Sponsler, my sister, Jessica Sponsler, and Adrienne Capretti for their constant love and encouragement.

1.0 INTRODUCTION

A 2007 report[1] by a committee composed of the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine revealed that the United States is losing its lead in science and technology. Globalization, modern communications and other advances in the science and research fields are creating job competition for Americans from workers around the world. To address this issue, the committee recommended increasing America's talent pool by vastly improving K-12 science and mathematics education. This included improving the number and quality of teachers for primary and secondary schools while creating opportunities for these students to pursue advanced work in the science fields through summer learning programs[1].

The need for early career planning in science and healthcare is imperative. In the past decade, there has been a major decline in the number of earned doctorates in these fields among U.S. citizens and permanent residents[2]. This is due in part to the rising popularity in non-science related careers among American youth. In 2006, the most popular majors in U.S. colleges and universities were business administration and management, psychology and elementary education[3].

Literature suggests student interest in science and health careers is dampened by several factors[1]. First, there are numerous high school and college prerequisites for science majors not required by other fields of study. Students are forced to take certain courses early in their

education, especially at the undergraduate college level. Those who choose not to or are unable to complete these courses by graduation may shut themselves out of a career in science or medicine. Meanwhile, students interested in law or business are able to wait until their junior or senior year of college to pursue a degree in these fields.

Introductory science courses may also function as “gatekeepers” that intentionally foster competition and encourage only the best students to continue. This may force less competitive but still highly qualified students from pursuing science degrees and future careers in this field.

Furthermore, current federal testing mandates such as the No Child Left Behind Act[4] promoted by the Bush administration as a solution to low-performing U.S. schools, are more focused on achievement rather than interest as an indicator to students of their success in a future career. A study by Tai et al.[5] investigated whether science-related career expectations of early adolescent students predicted the concentrations of their future baccalaureate degrees. Results revealed that students who expressed interest in science yet made only average math scores had a 34 percent chance of graduating college with science or engineering degrees while students with above-average math scores and no preference for science had only a 19 percent chance of earning these degrees. The study suggests focusing on activities that stimulate student interest in sciences rather than aptitude to increase the output of future scientists and health professionals.

Activities such as summer career education programs are one promising strategy for increasing student knowledge, perceived ability and career intent about science and health professions[6-13]. These initiatives provide opportunities for students to be exposed to various health careers, enabling them to make educated decisions about their future academic and career plans. Science and health career education programs have been well documented as being able to successfully foster student enthusiasm, interest, and knowledge about these fields[7-11, 13].

One such example is the Pennsylvania Governor's School for Healthcare (PGSHC), a five-week residential health career education program for gifted high school students which exposes students to primary healthcare careers and issues impacting the health of people in communities within Pennsylvania. I had the unique opportunity to be part of PGSHC from June 25-July 29, 2006, and was involved in a specific component of the program, the Public Health Improvement Project (PHIP), as a Learning Team Consultant (LTC). My role as LTC entailed planning and facilitating an inquiry-based learning project in the form of an educational curriculum. This consisted of eleven lecture-style classes, nine poster work sessions, two poster presentations, a field trip, and a final presentation (Appendix A).

Through my participation in PGSHC, I became curious about the future career plans of the students in the program. While PGSHC functioned without preferential guidance toward a specific health profession, many students expressed interest in a particular health career, even before they entered the program. I wondered if exposure to various health disciplines as part of the PGSHC curriculum might influence student knowledge, attitudes, and awareness of various health careers and to what degree did the program affect or change student career interests. This question formed the basis of my thesis, which provides a background on health career education programs; a summary of theories and concepts that demonstrate the importance of these programs; a description of PGSHC; an overview of program assessment methods; the results and conclusions of this research; limitations of the research findings; and recommendations to improve the impact of PGSHC for future participants.

2.0 BACKGROUND ON HEALTH CAREER EDUCATION PROGRAMS

2.1 IMPORTANCE

Early intervention and career awareness experiences are important for attracting students into particular professions[14, 15], especially healthcare[16]. Studies show that students begin actively planning for careers in the health professions during high school years with much of the career exploration taking place during their senior year[17]. Exposure to health careers early in a student's educational path increases motivation for a student to pursue a health career[18].

Science and health career education programs have been successful in initiating and/or maintaining a student's interest in health careers[19]. Voluntary programs like these are often held during the summer in museums, science technology centers, zoological parks, botanical gardens, community centers and university campuses and take the form of academic programs and other extracurricular activities. They aim to increase the visibility of and later enrollment in science and health related professions for youth, especially secondary school students, by providing an introduction to various career options in the field (e.g., medicine, pharmacy, dentistry, nursing, optometry, podiatry, audiology, speech pathology, physical therapy, and public health). They also aim to enhance student achievement in science and their understanding of the nature of science and scientific inquiry, which are important for later success in graduate and professional schools[9, 20, 21]. Some studies show that students involved in science career

education programs score higher on tests of scientific knowledge and have more interest in science and health careers than do control groups of non-exposed students[22].

Science career education programs can make science more exciting and innovative for secondary school students and offer them much more insight into the nature of science inquiry than is available in most high school science courses[12]. These experiences allow students to participate in hands-on, real-life activities with professionals in the field. Faculty and staff members involved in these programs can be important role models for students who may be interested in pursuing a career in health and science[7, 9-11].

Finally, science and health career education programs act as career pipeline programs by providing the ideal venue to spark student interest in the field and open their eyes to the many possible career opportunities in health and science[7, 9-11]. They foster student enthusiasm, interest and knowledge in science and health subjects which positively influence their interest in related careers.

2.2 STUDENT KNOWLEDGE, ATTITUDES AND BELIEFS

A review of the literature revealed that many studies which focused on career development and career choice among youth often looked at only traditional learning outcomes such as specific course grades, test scores, abilities, achievements and skills[23]. Little attention was given to other influential factors such as social interactions, relationships and life experiences[24]. When these nontraditional measures were studied, results revealed that various experiences influenced career interest. Encouragement and support from role models, social networks, and outreach programs were as important as academic ability in promoting student belief and confidence

about pursuing a health career. In addition, student career choice was often influenced by an internship or practical experience, experimentation, or other direct involvement with achieved professionals[25].

In a study of high school students from underserved communities, Zayas and McGuigan[24] examined how life experiences influenced students to develop a healthcare career interest. The study revealed that various factors impacted student interest, awareness and attitudes about health professions. Factors that encouraged pursuit of a future health career included familiarity with the healthcare system, role models, interactive health related school activities, the media, inspirational and accessible school staff, community partnerships, and family support. On the other hand, some factors potentially discouraged interest in health careers which included unsupportive social networks, inadequate school resources, perceptions of discrimination, limited or negative exposures to the healthcare system, and concerns about personal and financial commitment of health career training. This study showed how life experiences in addition to academic achievement influenced a student's interest in health careers.

Another study[19] about health career interest evaluated student feedback about career intent, social responsibility, and attitudes towards an interdisciplinary rural health education program in West Virginia. Results revealed that student interest in working in a rural setting increased after a practical experience. Students also gained awareness of social responsibility in the community in which they were working. Overall, this rural health experience increased students' favorable attitudes toward health careers, especially those in rural settings[19].

Research conducted by Sedlacek and Prieto[26] showed that nontraditional measures better predicted students' success in medical school than traditional measures such as academic ability. The study noted the importance of considering factors such as "the availability of a

strong support person,” “successful leadership experiences,” and for minority students “understanding and dealing with racism” as influential factors that encourage or discourage students from entering the health professions pipeline.

2.3 EXISTING PROGRAMS

Several hands-on and innovative programs exist that introduce primary, secondary and collegiate students to a wide variety of experiences in science and health fields. They are committed to expanding the future of America’s healthcare workforce, especially in underserved communities. To achieve this goal, programs provide students with an extensive introduction to the healthcare field, promote careers in the health professions, teach students about the research process and the nature of scientific inquiry, facilitate project-based learning, refine critical thinking skills, foster positive interactions with practicing physicians and other health professionals, provide work experience in the health care setting, and provide college preparation. Programs last in duration from one day to several weeks. Funding for these efforts include private and public support.

Such programs include:

- Governor’s schools, specifically the Virginia Governor’s School for Medicine and Life Sciences and the Pennsylvania Governor’s School for Healthcare[27]
- West Virginia Rural Health Education Partnerships (WVRHEP), funded by the W.K. Kellogg Foundation, the state of West Virginia and the Area Health Education Center[19]
- The Jackson Heart Study SLAM (Science, Language Arts, and Mathematics) Workshop[6]
- Stanford Medical Youth Science Program[28]

- Health Sciences Learning Academy (HSLA), part of Health Professional Partnership Initiative (HPPI), funded by The Robert Wood Johnson Foundation, the W.K. Kellogg Foundation, and the Association of American Medical Colleges[29]
- The Junior Fellows Program, a collaborative activity of the New York Academy of Medicine, the New York City Department of Education’s instructional regions, and regional academic medical centers[18]
- Student Educational Enrichment Program (SEEP) by the Medical College of Georgia School of Medicine[30]
- Health Careers Opportunity Program (HCOP), funded in several high schools by the Health Resources and Services Administration Division of Health Careers Diversity and Development (HRSA-DHCDD)[31, 32]
- The Health in Education Initiative, a partnership between the Association for Supervision and Curriculum Development (ASCD) and The Robert Wood Johnson Foundation[33]
- Medical Science and Technology Entry Program (Med-STEP) by the State University of New York at Buffalo, funded by the New York State Education Department[34]
- Area Health Education Centers (AHEC)/Health Education Training Centers (HETC) supported by the National Area Health Education Center Organization (NAO) and state and federal governments[35]

2.4 PROGRAM DESCRIPTION

Governor’s schools are one type of summer residential career education program that successfully motivate students through intensive learning experiences. The first governor’s school was founded in 1963 in North Carolina. Currently, over 100 schools in 28 states exist in the United States. They collaborate through membership in the National Conference on Governor’s Schools (NCoGS) which is an organization “committed to facilitating communication among summer residential governor’s school programs throughout the United States.[36]” Members are directors and other participants of governor’s schools who meet

annually to discuss development of future schools, reveal outcomes of past programs, and share successes and new ideas.

Although the mission and purpose of each governor's school varies, NCoGS specifies features common to all governor's schools[37]:

- Each school is a summer program for gifted and talented youths of high school ages.
- Each school has highly selective criteria for student admission.
- Most member schools are supported entirely or in large part by their state legislatures and educational funding.
- Schools vary in the length of sessions from one week to six weeks.
- All schools welcome inquiries regarding program and curricula.

In Pennsylvania, the first governor's school, created in 1973, was based on a pilot project initiated in the late 1960s to address the lack of educational opportunities and career counseling for artistically talented students[38]. This program was named the Pennsylvania Governor's School of the Arts. Between 1982 and 2001, other types of schools were created. Currently the Pennsylvania Governor's Schools of Excellence is made up of eight schools including Arts; Agricultural Sciences; Global Entrepreneurship; Information, Society and Technology; International Studies; Science; Teaching; and Healthcare.

The Pennsylvania Governor's School for Healthcare (PGSHC) is the focus of this thesis. PGSHC introduces participants to various aspects of the healthcare field, emphasizing delivery systems, primary care, prevention, public health, healthy communities, and health career options. The program is currently funded through a grant from the Pennsylvania Department of Health[39] which is awarded to the University of Pittsburgh School of Medicine. Students enrolled in PGSHC are awarded complimentary tuition, room, board, instructional materials and curricular activities for the duration of the program.

2.4.1 Admission

The criteria for acceptance into PGSHC[40] are that students must be residents of Pennsylvania, be high school juniors at the time of application deadline, possess strong writing skills as evidenced on the essay portion of the application, have maintained a consistently high grade point average throughout prior years in high school, receive positive comments in recommendation letters and have proposed an innovative public health leadership project for implementation in their community after completing the program. Submitted applications are reviewed by representatives from the University of Pittsburgh, the University of Pittsburgh Medical Center, Pennsylvania State Department of Health, Pennsylvania State Department of Education, other healthcare industries, and PGSHC program administrators. Applications are divided into groups based on geographic regions in Pennsylvania where the applicants reside[41]. Applications are compared only to others in the same group and not the entire pool. If a region does not have applications that meet basic or competitive criteria, no one from that region will be admitted.

2.4.2 Mission and Goals

The mission of the 2006 Pennsylvania Governor's School for Healthcare was divided into four components with corresponding goals. First, PGSHC aims to promote an interest in healthcare careers with particular emphasis on primary care and the needs of the underserved populations in Pennsylvania. Students should recognize forces that are reshaping the healthcare system, and in turn, the types of healthcare practitioners that are needed. Additionally, PGSHC will stimulate

student abilities and career interests with respect to the changing nature of healthcare, the healthcare workforce and health professions education.

Second, the program aims to promote an understanding of public health issues and the application of public health perspectives to the major health concerns in the United States and Pennsylvania. Students will examine healthcare issues within the context of normal human growth and development. They will use concepts and principles of epidemiology to recognize the health status needs of both the general population and special at-risk populations. By analyzing the health status of Pennsylvania and communities within the Commonwealth, students should understand the role of prevention and education in improving health status.

Third, the program aims to promote an understanding of professional competence, professional practice and health professions education. Students will explore what it means to be a competent professional and examine facets of professional competence. They should begin to acquire the knowledge and skills associated with competent professional practice and to identify ways in which they can continue developing competence as they prepare for a career in healthcare. Additionally they will recognize forces that are reshaping the nature of health professions education and the implications of these changes for their educational plans.

Fourth, the program aims to encourage students' commitment to making a positive contribution to the status of the public's health as they pursue their educational and career goals. The concept of making a difference in their own health status and the health status of their family, school and community will be examined as well as the concept of making a difference to and through their chosen profession. Finally, students should demonstrate their commitment to making a difference by planning, conducting and evaluating a public health related leadership project within their home community.

2.4.3 Curriculum, Faculty and Facilities

The PGSHC curriculum is organized into several components which include core health courses, concentration courses, reflective portfolio, research project, and other extracurricular activities like shadow days, observations and field trips. Core courses are divided into four sub-courses about 1) primary care, 2) public health, 3) designing a health program, and 4) creative thinking.

The 2006 PGSHC core courses included[42]:

- Caring for Health: a course designed to expose students to primary health care issues through the Healthy People 2010 objectives, presentations, case studies, communication exercises and hands-on activities.
- Thinking about Thinking: A series of sessions examining paradigms, creativity, constructive criticism, reflective learning, and writing, designed to orient students to the type of intellectual work they are expected to perform at PGSHC.
- Public Health Improvement Project: A team learning experience in which student groups examine a public health issue affecting Pennsylvania, its ethical and public policy attributes and possible causes and solutions.
- Making a Difference: A series of lectures, discussions and exercises designed to assist students in the planning and implementation of a leadership project, personal and professional development and improvement of their teamwork skills.

Concentration courses focus on one area of study and are assigned to students based on their preference. Topics for concentration courses include mental/behavioral health, geriatric health, maternal and child health, global health, rural health, and public health. The reflective portfolio component allows students to document their experiences and progress in the program through a reflective journal. The research project consists of the development of a public health research project related to their chosen concentration course. Projects are presented as professional posters at the end of the program. Finally, students are engaged in other activities including attending presentations given by health professionals, visiting health care facilities,

shadowing health professionals, watching healthcare related videos, and attending local cultural events.

Presentations, shadow experiences and healthcare facility tours introduce students first-hand to all types of healthcare professions in different settings. These activities allow students to meet and listen to healthcare professionals in person and often one-on-one. Professionals are given an opportunity to present information about their careers, explain their roles and responsibilities, and describe the education required for their professions. PGSHC encourages presenters to use visual aids, demonstrate medical equipment specific to their profession and involve student participation. Many of the PGSHC classrooms are located in the University of Pittsburgh School of Medicine.

PGSHC administrators, teachers and guest speakers involved in the program are affiliated with various healthcare facilities and organizations in the state of Pennsylvania. They work in various health careers as hospital administrators, researchers, physicians, dentists, pharmacists, nurses, professors and graduate students.

Students must remain in residence of PGSHC for the full 35-day program including weekends. Living arrangements place students in males-only and females-only quarters that are separate from other University of Pittsburgh campus groups. Trained staff monitors curfew and residential life. Students are required to attend all courses, trainings, field trips, study times, and social programs (see Table 1 for a typical schedule).

Table 1. PGSHC Daily Schedule

Time	Activity
7:00 – 8:00a.m.	Breakfast
8:00 – 8:30a.m.	General session
8:30 – noon	Core courses, concentration courses, discussion groups
Noon – 1:00p.m.	Lunch
1:00 – 5:00p.m.	Core courses, concentration courses, Public Health Improvement Project
5:00 – 6:00p.m.	Dinner
6:00 – 8:30p.m.	Service projects; guest speakers, discussion groups, residential life activities
8:30 – 10:30p.m.	Study or research time
10:30 p.m.	Curfew
Saturdays	Core courses, team training, field trips, study time, and/or social programs
Sundays	Morning, personal time; afternoon, study or research, presenters, computer lab; evening, residential life meetings

3.0 RESEARCH DESIGN

The assessment tools were chosen based on a review of the literature. Many studies about health career interest among the youth utilized surveys and other quantitative methods to assess the degree of impact of career education program on its participants. Few studies about this topic utilized qualitative research methods, although focus group research has been a particularly useful method of investigating attitudes, beliefs and opinions[24, 43]. Focus groups produce a very rich body of data expressed in the respondents' own words and context. There is no limit to focus group responses, unlike survey questionnaires that ask for predetermined responses on a rating scale. Because both methods of data collection were deemed useful, the methodology used in this assessment is a combination of both quantitative and qualitative procedures.

3.1 ASSESSMENT STRATEGIES

Educational institutions are increasingly conducting assessments of their academic programs and curricula in order to know what is being accomplished and to improve student learning outcomes. The definition of an assessment is “the systematic and ongoing method of gathering, analyzing and using information from measured outcomes to improve student learning[44].” Assessment has a broad meaning in which it can refer to the process of grading an individual

student's exam or judging the quality of an academic program. Examples of assessment tools include written and oral examinations, portfolios of work over times, pre- and post-test comparisons, presentations, surveys, exit interviews, focus groups, and curriculum analysis[45]. These tools are important components of the instructional design model[46] which is meant to improve, inform and confirm the quality or need for a program. The instructional design model like the one developed by the University of Pittsburgh Center for Instructional Development and Distance Education (CIDDE), shows assessment as key component in student learning (Figure 1).

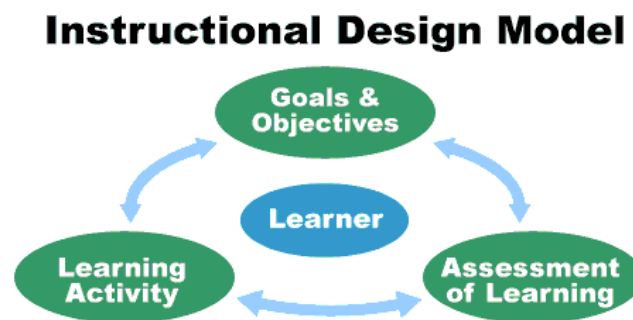


Figure 1. CIDDE Instructional Design Model

Focus group facilitation, for example, is an available tool for assessing educational programs. Focus groups are useful for obtaining general background information about a topic of interest, learning how respondents talk about the phenomenon of interest, and stimulating new ideas and creative concepts[47]. They explore a range of viewpoints among different groups of people in order to examine general ideas in more detail.

While many studies that reported on the impact of health career education programs on student knowledge, attitudes and career interest were survey-based, qualitative research such as focus groups and interviews may provide a greater depth of information. A review of the literature revealed that several themes emerged from focus group research about health career

interest among youth. These themes included experiences with the healthcare system, social networks, health-related activities, the media, school staff and guidance counselors, discrimination, disparities, academic ability, financial commitments, time commitments, and strategic community partnerships[24].

Focus groups facilitated by Zayas and McGuigan[24] were used in a study to examine how life experiences influenced youth to develop an interest in health careers. The participants were high school students enrolled in various New York state health professional programs: the Medical Science and Technology Entry Program (Med-STEP)[34], the Health Career Exploration Program (HCEP)[48], and a health-oriented high school in the Bronx. Questions were constructed by a qualitative research expert who moderated all focus groups. Sample questions included:

1. What professional career are you contemplating right now?
2. How did you learn about the Med-STEP program, and why did you decide to enroll?
3. When and how did you become interested in pursuing a career in healthcare?
4. What other things have made it easy for you to consider pursuing a career in healthcare? Please explain.
5. What things have made it difficult for you to consider pursuing a career in healthcare? Please explain.
6. What role, if any, has anyone played in your interest to pursue a career in healthcare? Please explain.
7. What role, if any, has the media played in your interest to pursue a healthcare career? Please explain.
8. What obstacles do you think lie ahead for you to complete studies or training leading to a healthcare career? Please explain.

Results revealed that an ecological model of factors like social interactions and relationships most influenced career intent among high school students from underserved communities. The focus group methodology implemented in this study encouraged participants to openly discuss their opinions and experiences while allowing the moderator to probe for deep, personal narratives.

3.2 RESEARCH QUESTIONS

Based on a review of the literature, this thesis aims to answer several research questions regarding student satisfaction with PGSHC and the influence of its curriculum on student knowledge, attitudes and awareness of various health careers and to what degree the program affected or changed student career interest. The research questions that are the basis of this thesis include:

1. To what degree is your interest in and awareness of health sciences and careers in this field?
2. What has been your greatest influence in potentially pursuing a health career?
3. How has participating in PGSHC influenced your interest in pursuing a career in the health professions?
4. How has participating in PGSHC influenced your interest in a health related major in college?

The research questions will be the foundation for the questions contained in the survey and focus group assessment tools.

3.3 HYPOTHESIS

I hypothesize that PGSHC program participants will report increased enthusiasm for the health sciences, increased knowledge and awareness of health professions, increased interest in pursuing a health related major in college and a health career later in life and a high level of overall satisfaction with the program. These assumptions are based on a review of the literature about the success of health career pipeline programs and the degree in which student knowledge, beliefs and career intent are positively impacted as a result of participation.

4.0 METHODS

An assessment was conducted with the 2006 Pennsylvania Governor's School for Healthcare student participants in the form of satisfaction surveys and focus groups. All study protocols, surveys and focus group questions were reviewed and approved in advance by Karen Narkevic, MA, Director of the Pennsylvania Governor's School for Healthcare. All data collection took place between June and August of 2006.

The University of Pittsburgh Institutional Review Board (IRB) did not require approval for the implementation of this project because the intent of this research was deemed to be program improvement. Quality assurance, curriculum evaluation and program improvement activities are not constituted as research by IRB and are not subject to approval[49]. Additionally, students involved in this project were not considered human research subjects, therefore did not require consent. As a courtesy, the principal investigator asked for student consent prior to conducting surveys and focus groups. All students were informed their participation was voluntary, anonymous and confidential.

4.1 STUDY POPULATION

The participants of this study were students from the 2006 Pennsylvania Governor's School for Healthcare. All students who were still enrolled in PGSHC during the last week of the program

were invited to complete a survey and participate in a focus group session (n=108). Initially, 110 students were accepted into the program but only 108 students graduated. One student declined admission at the beginning of the program and another dropped out of the program during the third week.

4.2 SETTING

Research was conducted on the campus of the University of Pittsburgh in Pittsburgh, Pennsylvania, in classrooms located in the School of Medicine and the Graduate School of Public Health.

4.3 SURVEY

A 21-item survey was developed over a three-month period during the summer of 2006 to assess PGSHC effects on student's reported knowledge, attitudes, and awareness of health careers (Appendix B). The questionnaire was modeled after the University of Pittsburgh Office of Measurement and Evaluation of Teaching (OMET) Student Opinion of Teaching Questionnaire for the Graduate School of Public Health. Due to copyright restrictions, no questions from this questionnaire were used in the same format in the survey used in this study. The OMET questionnaire was simply used as a model.

The study survey went through several revisions and received feedback from Kenneth Jaros, PhD, an expert in evaluation studies at the University of Pittsburgh Graduate School of

Public Health and Karen Narkevic, MA, the Director of the Pennsylvania Governor's School for Healthcare. The final version was distributed to students by the PGSHC Director during a mandatory activity on the last day of the program on July 28, 2006. The response rate was 99.07% (n=107).

Questions were primarily quantitative and based on a three-point Likert scale (1=to a great degree; 2=somewhat; 3=not much at all). Two questions allowed students to write in answers about health careers not mentioned on the survey and general comments about the program. Total time to complete the survey was approximately 10 minutes.

4.4 FOCUS GROUPS

Focus group questions were developed over a two-month period during the summer of 2006 to assess PGSHC effects on student's reported knowledge, attitudes, and awareness of health careers. Focus group questions went through several revisions and received feedback from Martha Ann Terry, PhD, an expert in focus group preparation, facilitation and application at the University of Pittsburgh Graduate School of Public Health and Karen Narkevic, MA, the Director of the Pennsylvania Governor's School for Healthcare.

Focus groups were scheduled during the second to last day of the program during residential life activities, study and research times. Students were recruited by the PGSHC Director, who announced the opportunity at a mandatory activity. A total of 21 students volunteered to participate in one of four focus groups on July 27, 2006. Participants were different genders, races, ethnicities, and were from various geographic locations within Pennsylvania. Due to the limited time allotted for extracurricular activities in the PGSHC

schedule, the total time allowed for each focus group was approximately 45 minutes. The facilitator of all sessions was the principal investigator of this thesis.

Before focus groups were conducted, participants were asked permission to be audio-recorded and their comments transcribed. An audio recorder with a detachable microphone was used to tape each focus group on a 90 minute audio cassette. All focus groups utilized the same semi-structured format which allowed students the flexibility to discuss freely while addressing the questions asked by the facilitator. Seven questions were asked including one “ice breaker”.

Questions included:

1. What Public Health Improvement Project (PHIP) group were you in?
2. Why did you apply to PGSHC?
3. What have you learned about health related careers?
4. How has participating in PGSHC influenced your interest in a health career?
5. How has being here influenced you to pursue a potential health related major in college?
6. What components of PGSHC did you find most beneficial? Least beneficial?
7. If you could change PGSHC, how would you change it?

The first two focus groups were conducted in a lecture room at the University of Pittsburgh School of Medicine while the third and fourth were conducted in a conference room in the University of Pittsburgh Graduate School of Public Health. Both rooms were assigned by the PGSHC Director and were comfortable, quiet and had minimal distractions.

4.5 DATA ANALYSIS

Survey data were entered into a single database using the Statistical Package for the Social Sciences (SPSS) version 14 and coded according to answer choice. Descriptive statistics such as frequency distributions, means, correlations and percentages were utilized. A paired sample t test

was used to compare the means of pre- and post-program interest in health careers. Open-ended questions underwent content analysis to determine categorical responses.

Focus groups were audiotaped and transcribed verbatim by an independent transcriptionist. Transcripts were analyzed using a process similar to the indexing process outlined by Frankland and Bloor[50]. Each complete thought (utterance) was first assigned to a broad theme and then further divided into specific codes. Complete thoughts were assigned to multiple codes if appropriate. As focus group transcripts were read and new codes created, thoughts were reassigned if appropriate. Overall, 226 complete thoughts were divided into 49 codes, that were further sorted into five themes (Figure 2).

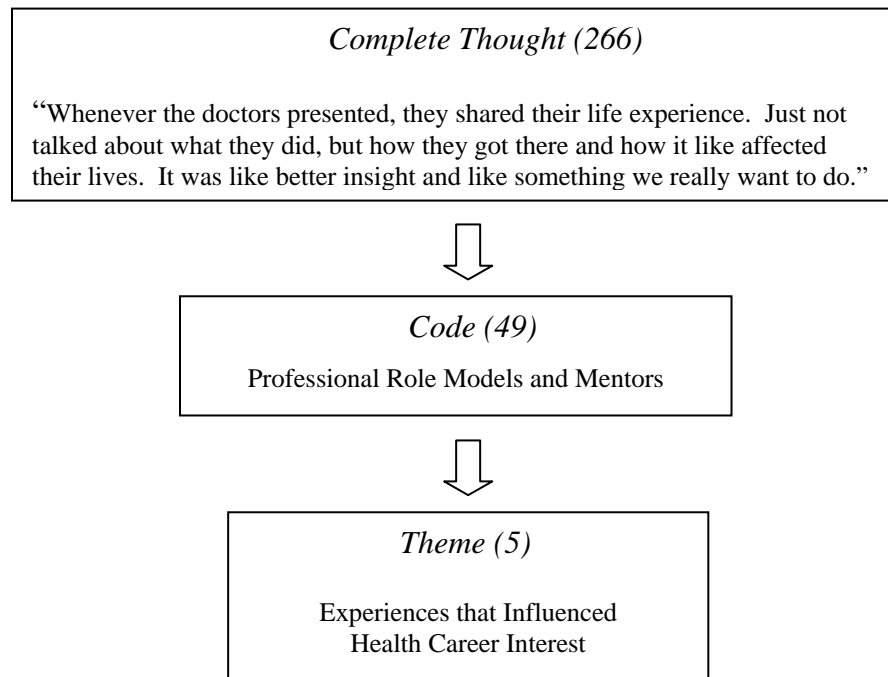


Figure 2. Example of coding process from focus group transcripts

5.0 RESULTS

Findings were derived from both surveys and focus groups. Results from the surveys cover topics such as program satisfaction; knowledge about and awareness of various health professions; health career interest before and after attending PGSHC; and future career, college and college major choice. Results of the focus groups cover topics such as reasons for applying to PGSHC; program influence on knowledge, experiences that influenced health career interest, future college major choice; and recommendations for program improvement.

5.1 SURVEY

5.1.1 Program Satisfaction

Results from the survey revealed an overwhelming majority felt the program increased their passion toward the healthcare field (79% to a great degree, 17% somewhat) and was an empowering experience (85% to a great degree, 13% somewhat). The survey also showed that the students felt the program promoted the development of friendships and peer support networks (92% to a great degree, 8% somewhat) and increased their ability to work with a team

(66% to a great degree, 31% somewhat). Students claimed they were highly satisfied with PGSHC and felt it was worthwhile participating in the program.

5.1.2 Knowledge and Awareness

The majority of students said PGSHC increased their knowledge about and awareness of health careers (Figure 3). Most students claimed the program provided them with knowledge about where to get information about health careers (60% to a great degree; 36% somewhat) and increased their overall knowledge about current health issues (71% to a great degree, 28% somewhat).

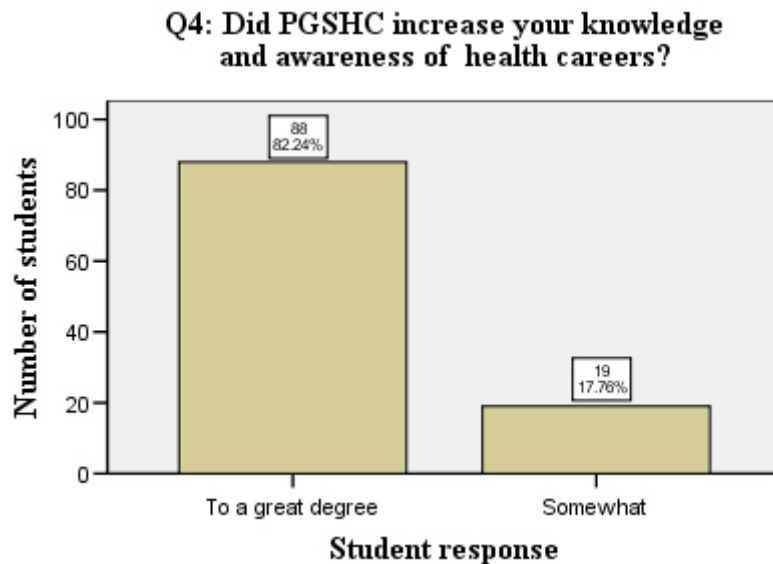


Figure 3. Impact on knowledge and awareness about health careers

Students reported the program made them more aware of a broad range of healthcare specialties (82% to a great degree, 16% somewhat) as well as acute healthcare specialties (55% to a great degree, 33% somewhat). The program provided an adequate amount of information

about the practical issues (financial planning, constructing personal statements, resume building, interviews) in pursuing a future career in healthcare (53% to a great degree, 41% somewhat).

5.1.3 Career Interest Before and After Program

A paired sample t-test was used with the survey data to compare the means of student health career interest before and after attending PGSHC. The results of the test revealed the change of interest in health professions due to involvement in the program was not statistically significant. Actually, student interest in health careers slightly declined due to involvement in the program. Figures 4 and 5 show a summary of results.

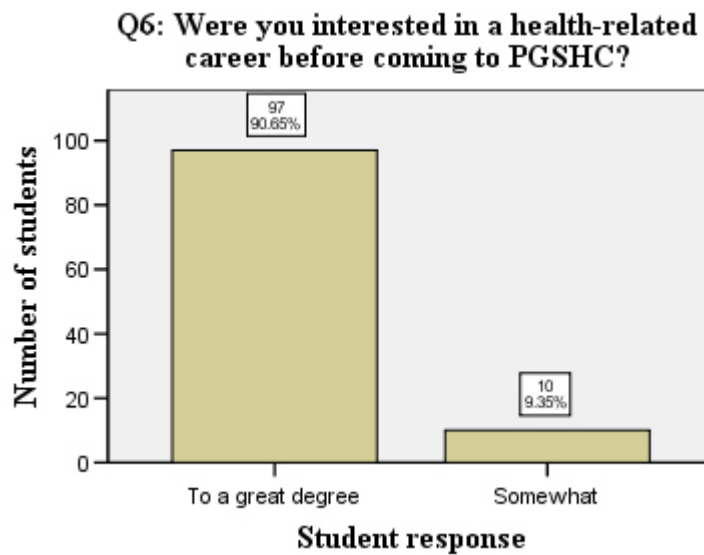


Figure 4. Interest in a health career BEFORE program

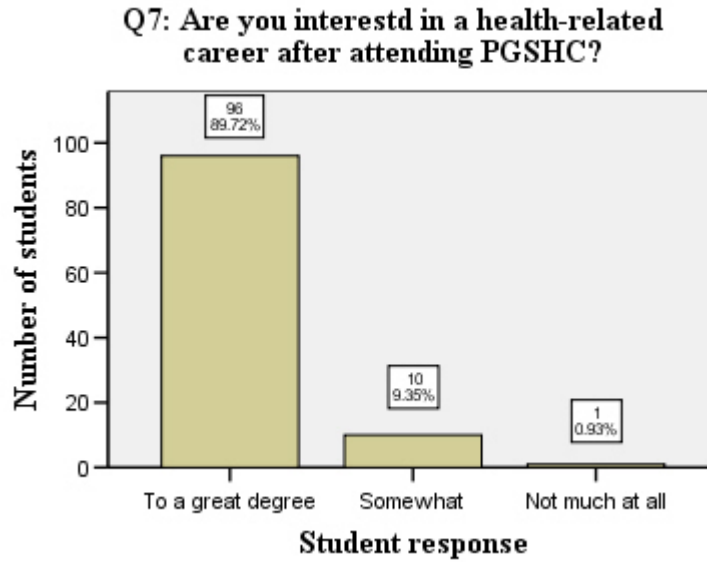


Figure 5. Interest in a health career AFTER program

5.1.4 Career Intent

Students felt PGSHC influenced their decision to pursue a future career in a health profession to a great degree (Figure 6). Students also believed the program provided confidence and motivation for the development of their professional identities (79% to a great degree, 18% somewhat).

Q8: Did PGSHC influence your future career choice in a health related profession?

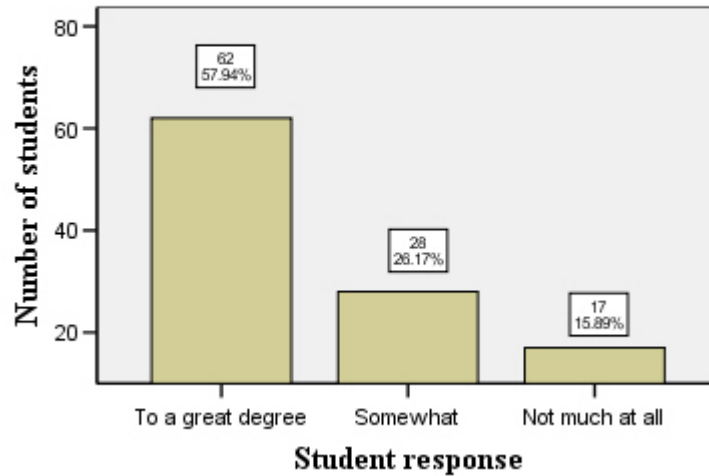


Figure 6. Influence on future health career choice

A ranking of several health careers listed on the survey instrument showed the most popular career was medicine while other choices included nursing, pharmacy, dentistry, public health and health and rehabilitation services (Table 2). Students were also able to write-in other health careers not mentioned on the survey which included careers in the mental health services, social work, research, allied health, optometry, nutrition, health policy and various medical specialties. Overall, students agreed their interest in the health professions increased as a result of participation in PGSHC.

Table 2. Q9: To what degree do you think about the following health profession as a career option?

		To a great degree	Somewhat	Not much at all	Total
Medicine	Count	83	19	5	107
	%	77.6%	17.8%	4.7%	100.0%
Nursing	Count	10	31	66	107
	%	9.3%	29.0%	61.7%	100.0%
Dentistry	Count	12	30	65	107
	%	11.2%	28.0%	60.7%	100.0%
Pharmacy	Count	8	25	74	107
	%	7.5%	23.4%	69.2%	100.0%
Public Health	Count	14	43	50	107
	%	13.1%	40.2%	46.7%	100.0%
Health and Rehabilitation Services	Count	18	29	60	107
	%	16.8%	27.1%	56.1%	100.0%
Other Health Career	Count	50	11	37	98
	%	51.0%	11.2%	37.8%	100.0%

5.1.5 College and Major Intent

Regarding future academic goals, the survey indicated that PGSHC influenced students about their future college choice (52% to a great degree, 35% somewhat) and future college major choice (62% to a great degree, 32% somewhat). The survey showed that all students believed they were capable of getting in and passing the correct exams to go to a health professional school (medical, dental, pharmacy, graduate, etc.) after undergraduate school (69% to a great degree, 31% somewhat).

5.2 FOCUS GROUPS

5.2.1 Interest in Applying

Data from focus groups revealed that initial interest in attending PGSHC was mostly influenced by encouragement from family members including relatives in healthcare occupations or siblings who had attended PGSHC programs in the past. Other responses for attending the program included prior interest in health professions, the desire to learn about career options in healthcare, the desire to obtain experience in the healthcare environment for college applications and encouragement from friends, guidance counselors, and teachers. One student applied to PGSHC to learn about various health careers options other than medicine or nursing.

5.2.2 Experiences that Influenced Health Career Interest

Certain people and experiences initiated, changed and/or maintained student interest in health careers, among those were professional role models, mentors, peers, family members, exposure to healthcare facilities, and participation in health curricula and activities.

Health professional role models and mentors

Professional role models and mentors in the health professions, especially those who are involved with PGSHC, were recognized as key inspirations to students. One female participant said, “Every time we go to a lecture, the presenter always seems to have a passion for what they do and I really, really want that. And it’s always so rewarding and there’s always so many positive things that you can [do as a health care professional.]” Several students identified a specific health professional involved with PGSHC who increased their interest in health careers,

especially about the work-life balance. For example, one professional was asked about the time commitment involved with his job. He responded by “putting his wife on speaker phone so [the students] could ask her questions—to explain family life and how family and work are able to be balanced.” Passionate, energetic PGSHC mentors sparked the most interest in the health careers among the students. Students were most receptive to presenters who were lively, upbeat and provided opportunities for students to participate in activities. A male student claimed, “I shadowed [a physician.] It’s those people who make you want to be a doctor. I want to be like that guy. I want to be charismatic. I want to help people...He rubbed off [when he] talked to us.”

Peer support and shared interests

Being surrounded by and interacting with peers who shared academic or career interests in the health fields was deemed as a motivator and positive influence. Several students talked about their friendships, common interests and mutual support. Someone mentioned he “felt like less of a nerd because in school, people are like ‘Ooh, you like science, ooh loser.’ And you come here and there are people who are just like you so...we’re cool together. It was cool to meet people who have similar mentalities.” Most students felt they could rely on other peers in PGSHC for support and encouragement. One student felt she was able to “draw energy from everyone around me...No matter who we were, where we came from, we’re all supported [by each other.]” Their common desire to help people or responding to “a calling” bonded many PGSHC participants. In addition, they felt they shared similar personality traits like being caring and altruistic.

Family members in healthcare professions

Relatives working in healthcare influenced students, especially those participants whose parents worked in the field. While some students said it was a positive influence on their career

choices, one student said it negatively influenced her interest in practicing medicine and remarked, “Because both of my parents are physicians and I see the type of lifestyle they have and see everything I really don’t like and [it’s a deterrent from become a physician.]” The student later said she was interested in dentistry. Family experiences with health problems was another influential factor on student career interest as one student declared his passion for neurology derived from his mother who has multiple sclerosis. Another student said she wanted to specialize in obstetrics and gynecology as a result of being adopted due to her mother’s infertility.

Participation in health curricula/activities

Participation in health related curricula and activities initiated student interest in health careers. Some students developed an interest in a particular health profession after completing a health related course, program or activity, such as engaging in a presentation, shadowing health professionals or going on a field trip. One student recounted a shadow experience with a medical student which was “the most rewarding experience for me because you can talk about being a med student all you want, but until I actually got there and shadowed a med student, I didn’t really understand what it entailed.”

Other PGSHC activities such as attending presentations, speaking to health professionals one-on-one and visiting healthcare sites validated student interest. Presentations about various health occupations were very important for career decisions to one male student who said, “I think for those who knew what we wanted to do, I think we strengthened [our interest in health careers.] We are able to make a better decision. And for those of us that didn’t know what we wanted to do, we have options now because [PGSHC] brought different professionals into talk to us and we got to see what different areas had to offer...The presentations shaped a lot of the

students' minds about what they want to do." Even when students were exposed to a healthcare profession they disliked, they remained interested in some type of health career. A student interested in medicine remarked, "I've always wanted to be a physician...but [after learning about] internal medicine, I know I definitely would never want to do that. So it hasn't swayed my mind [about being a physician]—it hasn't changed what I want to do, but it's definitely cemented things that I don't want to do."

Some students reported a decreased interest in certain health careers due to boring classes and dull activities. A few students felt the course schedule was too rigid and others thought it was filled with too many lackluster presentations. A male student said, "I felt like I'm just getting lectured at and PowerPointed at. When I'm in college, I'll be able to handle it. But when I get this eight hours straight, no wonder people fall asleep."

Living and learning experience in a healthcare environment

Being exposed to and taking part in an experience in medical facilities and the healthcare environment increased students motivation and determination to become a health professional. Two students recounted: "[We were] walking to breakfast and this guy was going down the escalators and we were going up. He was like, 'You guys from the Governor's School?' We were like, 'Yeah.' He was a doctor. He said, 'Oh yeah? I went there.' And that was really inspiring because it's like we could do that." Another experience in the operating room influenced one student to become a surgeon who said, "I want to be a plastic surgeon and I [observed a surgery] where they took a bone out of this guy's leg and put it into his jaw because he had cancer in his face. That was cool." Students felt living near and learning in medical settings were stimulating, interactive and rewarding.

Level of academic commitment

Students were concerned with the sacrifice and dedication required to become a health professional. PGSHC exposed students to the realities of medical school and other health professional schools. One student remarked, “I was less scared [of a career in medicine before entering PGSHC] because I never realized how much it entailed. I thought it’s going to be cool to be a doctor. But now I feel...that it’s going to be so hard and you’re going to want to quit every single day...that it’s made me really scared.” Students contemplating highly regarded specialties such as surgery were most worried about the time commitments of school.

Health career options

The number of career options presented throughout the course of the program did not influence student interest in health professions. Several students thought that too few career options were presented during the course of the program, especially specialties. A student from a rural area wanted to obtain information about neurology. Unfortunately, neurology was not a specialty offered in a presentation or shadow day. Instead, the student “got stuck with dialysis and dentistry. [The University of Pittsburgh] has one of the biggest centers for neurology and nothing [in the PGSHC program] was offered in neurology.” Other students were equally disappointed by the lack of specialty options in the program because it “skipped certain fields people might be interested in like neurology, oncology, cardiology, and other certain specializations” as one student claimed. Another student felt the majority of his peers were most interested in medicine although PGSHC scheduled only four practicing physicians to present. He felt too little emphasis was put on medicine. On the other hand, some students felt confused by the large number of career options. A female student commented, “[Introduction to many opportunities] made it a lot more difficult for me because before coming to this, I [planned] to go

to medical school...I'll be fine...I'll just go to med school. And now that I've come here, I was like is that really what I want to do? Oh my gosh. I don't know. So I'm just a lot more confused right now.”

Other Experiences

Finally, other PGSHC experiences that encouraged interest in health careers were raised awareness about the financial/economic benefits of being a health professional, confidence in ability to complete necessary academic requirements leading to a health profession, and confidence in ability to work in a team.

5.2.3 Career Intent

Data revealed student health career intent fell into two categories: those who identified specific health professions as future careers prior to participation in PGSHC and those whose health career interests were initiated or changed as a result of participation in PGSHC. Examples of careers considered prior to participation in PGSHC included dentistry, neurology, plastic surgery, obstetrics, gynecology, oncology and physical therapy. Examples of career interest initiated or changed by participation in PGSHC included internal medicine, dentistry, doctor of osteopathy (OD), healthcare administration, obstetrics, emergency medicine and joint degree programs like MD/PhD.

Many students thought PGSHC presented many different careers in healthcare they did not know about. This increased interest in health professions by exposing students to previously unknown jobs, especially those that closely matched their interests. One student remarked, “[Before participating in PGSHC] I considered healthcare to be just medicine. I didn't consider [other fields.] I didn't consider everything. [PGSHC] really opened my eyes to other professions

and made me really want to go into healthcare in some capacity.” Another student said he “just wanted to get my PhD but then I learned about the MD/PhD program which seems like a cool thing to do. It was good that [PGSHC] showed us different [options.]”

5.2.4 College and Major Intent

Some students changed their future college major intent after participating in PGSHC. The program initiated an interest in non-science subjects like business, Spanish, English, music, and marketing. Health professionals who presented at PGSHC encouraged students to major in subjects they are passionate about rather than what they think graduate schools want. One student said, “Before I came here, I [thought] I’d major in bio and chemistry. Then we talked to a bunch of doctors and they said [graduate schools] really want diversity. I love Spanish but I was going to push that aside to major in biology...[PGSHC] really opened my eyes to see that I really don’t have to do that.” PGSHC also informed several students what major would best prepare them for their future careers. A student interested in health administration remarked, “I realize now...An undergraduate major in business would be a lot more helpful to me than biology if I was going to be an administrator.”

5.2.5 Program Improvement

Student from the focus groups suggested several recommendations to improve PGSHC for future participants. They proposed less rigid schedules, more relaxation time, access to the gym/pool, ability to choose concentration courses and shadow assignments, more dynamic presentations, and more visits to neighboring colleges and medical facilities.

Students were exhausted as a result of their busy schedules which began at 7am and ended at 10:30pm. Little time was allocated for relaxation or socialization which only occurred during meal times or briefly before curfew. Students wanted more time to pleasure read, call family and bond with their peers. Another concern was lack of time and permission to exercise. PGSHC prohibited use of gym and pool facilities despite the fact that many PGSHC participants were athletes who sacrificed their summer sports training to attend the program. Several students suggested allocating time every day for exercise.

Students felt presentations weren't tailored to their interests. Courses were assigned based on scheduling logistics instead of student preference. For example, a student who discovered her disinterest in dentistry early in the program was later forced to attend several more lectures about this topic. Meanwhile, another student who was very interested in dentistry was provided the opportunity to attend only one class despite her request to attend more. The students suggested providing several presentations at the same time and allowing students to choose instead of "being randomly assigned classes." Also, presentations were not appropriate for a high school audience. Speakers were unanimated, boring and had too much time to present which caused students to fall asleep. One student suggested, "I think PGSHC should vary the lectures and make them different periods of time instead of always an hour and a half. After the second lecture of the day...it was brain numbing."

Finally, there was a missed opportunity to visit surrounding colleges and medical centers. PGSHC traveled to several universities and hospitals which often took an entire day, most of it spent driving to and from the facility. One student commented, "We went to Dubois [University]...for a feel of rural health. But it was a wasted day. There's no point driving [all day] when it didn't seem to be all that different than the University of Pittsburgh." Students

were more interested in visiting local colleges like “Carnegie Mellon University which is one of the best universities in the nation. I do not understand why we did not take a tour [when] we are down the street although we drove all day to Dubois. I didn’t understand.” A student suggested the reason for all day field trips was to fulfill program requirements and “to say that we did this and this and this.”

6.0 DISCUSSION

This study documents student satisfaction with the 2006 PGSHC program and the influence of its curriculum on student knowledge, attitudes and awareness of various health careers and to what degree the program affected or changed student career interests. Exposure to experiences which positively influenced student interest in health careers included interactions with professional role models and mentors in the health professions, being surrounded by and interacting with peers who shared academic or career interests in the health fields, participation in health related curricula and activities, being exposed to and taking part of an experience in medical facilities and the healthcare environment, knowing relatives who work in healthcare, learning about the financial/economic benefits of health careers, increased confidence in ability to complete necessary academic requirements leading to a health profession, and increased confidence in ability to work in a team.

In contrast, some experiences were not shown to positively impact student health career interest. Learning about the rigorous level of academic commitment required to enter health professions deterred some students from considering certain jobs in healthcare. Being exposed to a wide variety of health careers through the PGSHC curriculum confused some students about future career choice and raised awareness about jobs outside of healthcare. Also, student involvement in a highly monitored program that did not allow them to choose their own schedules or courses dampened spirits.

The analyzed survey data about interest in health careers before and after attending PGSHC (questions 6-7) were not statistically significant. Overall interest in health careers remained unchanged pre- and post-program. The likely cause was that students had already identified specific health professions as future career choices prior to participation in PGSHC. They were already highly interested in health careers before attending PGSHC and maintained this interest upon finishing the program. Although interest in specific healthcare jobs may have changed due to exposure to previously unknown jobs through participation in PGSHC, especially those professions which closely matched their interests, overall health career interest remained unchanged.

It should be noted that one student reported a decreased interest in health careers. The change may be a result of regression to the mean. Any extreme score on a measure at one point in time will likely have a less extreme score the next time they are tested due to statistical reasons. Another reason may be due to the realization that healthcare careers do not match the student's interests. The student may be more interested in another field.

The PGSHC program developers should consider addressing the concerns raised from the focus group discussions to improve the program for future participants. For example, students mentioned the importance of stimulating classes and presentations as well as one-on-one experiences with health professionals. Learning about the healthcare field through hands-on activities provided students with a more meaningful experience than being lectured at. Although results from the assessment tools showed students increased their knowledge and awareness about healthcare and careers in this field, they were bored and restless during many learning activities. Future programs should consider incorporating more engaging activities into the curriculum like visiting health care facilities and shadowing health professionals. Future

assessment strategies should focus on program improvement and creating a challenging curriculum, instead of aiming to improve student learning. Programs aimed at gifted students should focus on higher-level thinking, problem-solving abilities and creativity[51].

Furthermore, PGSHC recruits its participants based on high academic achievement while similar health career education programs target youth from underserved areas or minority students as participants in their programs[6, 16, 18, 19]. These programs recruit students from poor urban and rural communities with many ethnic minority populations and/or disadvantaged residents as a workforce development strategy. This expands the pool of potential workers while promoting workforce diversity as a way to address healthcare disparities[52, 53]. More than 25% of the U.S. population is of African American, Latino and American Indian descent, but they make up only 9% of the nation's nurses, 6% of its physicians and 5% of dentists[53]. Maintaining diversity and expanding program selection criteria may be another issue program developers may consider for future PGSHC programs.

6.1 STUDY LIMITATIONS

A limitation of this study is the pool of PGSHC participants. Students who apply to PGSHC are already interested in science and healthcare and have achieved high grades in high school science classes. Most have aspirations to pursue a career in health or medicine as indicated in their PGSHC applications and revealed in survey and focus group assessments. While PGSHC has proven to have a positive influence on their enthusiasm toward healthcare, a future study is warranted to determine how a similar program may impact students who are not already academically talented or interested in the science and healthcare fields.

This study may have benefited if the survey was administered as a pre-post test design and also given to a control group of students who matched the PGSHC participants. The original study design was retrospective and asked students about their pre-program interests and influences at program completion.

Additionally, the quantitative questions from the survey instrument were based on a three-point Likert scale (1=to a great degree; 2=somewhat; 3=not much at all) that held an inherent bias in the range of answers. Both responses 1 and 2 were positive in nature while response 3 was negative. The results of the survey may have benefited if answers were based on an anchored scale with five or seven points which had equal intervals between each point.

7.0 CONCLUSION

This study lends support to the evidence that health career education programs are successful in promoting student interest in healthcare careers. The results indicate that students who attended the 2006 PGSHC felt the program increased their awareness of health careers and knowledge about where to get information about them. Students were confident, motivated and empowered about entering the healthcare field as a result of PGSHC. The program was shown to have had a positive effect on most participants, increased student knowledge, attitudes and awareness of various health careers and maintained student career interest. Overall, students were satisfied with the program and felt it increased their passion about healthcare.

This research presents tools that may be useful for assessing other health career outreach programs. Through integrating qualitative and quantitative data collection methods, an attempt was made to maximize the amount of student information obtained. Future studies, employing a more rigorous study design, may further address to what extent programs like PGSHC initiate and/or maintain health career interest among high school students.

APPENDIX A

COURSE SYLLABUS

Syllabus begins on page 46.

**Pennsylvania Governors School for Health Care
Public Health Improvement Project Course**

POPULATION AND FAMILY HEALTH

**Learning Team Consultant: Jennifer Sponsler
University of Pittsburgh Graduate School of Public Health
Cell: 202-210-0664; Work: 412-361-3355; jennifersponsler@yahoo.com**

Focus

This course will use a cross-cultural perspective to examine the issues concerning population structure and change, sexual and reproductive health, maternal and child health, health policy, and health communication. Focus will include the health and behavior of populations worldwide with an emphasis on mothers, infants, families, adolescents, women, the elderly, individuals with special health care needs and the underserved and disadvantaged. The disciplines applied in the creation of this course include women's studies, anthropology, epidemiology, sociology, psychology, health service research, economics, public policy, biology, immunology, environmental sciences, and behavioral sciences.

Objectives

By the end of this course, you will be able to:

- **Discuss this history of human reproduction and birth control across cultures**
- **Identify existing maternal and child health services**
- **Recognize current family planning policies in the United States**
- **Identify components of population change (birth, deaths, migration) and population structure (age, sex, family arrangements, urbanization)**
- **Examine how population growth impacts the environment**
- **Locate available resources and career opportunities in the field of population and family health**
- **Construct three conceptual posters**

Grading

Grades will not be assigned in this course. However, students are expected to express themselves in class discussions which are extremely important in deepening the impact of this experience. The true goal of this course is to teach you that your influence matters whether you become an actor, teacher, business executive, skilled laborer, political leader or physician. When you are taught a few skills and given the proper tools, you can make amazing contributions to society.

Course Outline

Session	Date	Activity	Topic
1	6/29/06	Class	Introduction to Population and Family Health
2	6/30/06	Linsly Center	Group Activities and Team Building
3	6/30/06	Class at Linsly Center	How to Create a Metaphor Poster
4	7/2/06	Work Session	Metaphor Poster Preparation
5	7/5/06	Work Session	Metaphor Poster Preparation
6	7/5/06	Class	History of Women's Rights
7	7/6/06	Class	Introduction to Human Reproduction and History of Contraceptives/Birth Control
8	7/6/06	Work Session	Final Metaphor Poster Preparation
9	7/7/06	Poster Presentation	
10	7/7/06	Poster Debriefing	
11	7/10/06	Class	Ethical Issues of Population and Family Health Services
12	7/11/06	Class	Reproductive Health in the Age of HIV/AIDS and other STDs
13	7/12/06	Work Session	Ethics Poster Preparation
14	7/14/06	Class	Infertility and Abortion
15	7/14/06	Work Session	Ethics Poster Preparation
16	7/16/06	Work Session	Final Ethics Poster Preparation
17	7/17/06	Poster Presentation	
18	7/17/06	Poster Debriefing	
19	7/20/06	Class	Politics, Policy and Family Planning
20	7/21/06	Class	Factors in Population Change, Structure and Demographics
21	7/23/06	Work Session	Final Presentation Preparation
22	7/25/06	Class	Population and the Environment
23	7/25/06	Work Session	Final Presentation Preparation
24	7/26/06	Class	Career Opportunities in Population and Family Health
25	7/26/06	Work Session	Final Presentation Preparation
26	7/27/06	Final Presentation	

APPENDIX B

PGSHC STUDENT QUESTIONNAIRE

Student questionnaire begins on page 49.

PGSHC Student Questionnaire

DIRECTIONS: CIRCLE THE CATEGORY THAT BEST DESCRIBES YOUR JUDGEMENT

1 TO A GREAT DEGREE 2 SOMEWHAT 3 NOT MUCH AT ALL

- | | | | |
|--|---|---|---|
| 1. Did PGSHC increase your knowledge about current health issues? | 1 | 2 | 3 |
| 2. Did PGSHC provide exposure to acute specialties in health care practices (for example, surgery)? | 1 | 2 | 3 |
| 3. Did PGSHC provide exposure to a broad range of specialties in health care practices (for example, general practices, public health, pharmacy, nursing)? | 1 | 2 | 3 |
| 4. Did PGSHC increase your knowledge and awareness of health-related careers? | 1 | 2 | 3 |
| 5. Did PGSHC increase your knowledge about where to get information about health-related careers? | 1 | 2 | 3 |
| 6. Were you interested in a health-related career before coming to PGSHC? | 1 | 2 | 3 |
| 7. Are you interested in a health-related career after attending PGSHC? | 1 | 2 | 3 |
| 8. Did PGSHC influence your future career choice in a health-related profession? | 1 | 2 | 3 |
| 9. To what degree do you think about the following health profession as a career option for you? | | | |
| Medicine | 1 | 2 | 3 |
| Nursing | 1 | 2 | 3 |
| Pharmacy | 1 | 2 | 3 |
| Dentistry | 1 | 2 | 3 |
| Public Health | 1 | 2 | 3 |
| Health and Rehabilitation Sciences (therapy, communication disorders, etc.) | 1 | 2 | 3 |

<p>CONTINUED ON BACK PLEASE FLIP OVER</p>
--

1 TO A GREAT DEGREE

2 SOMEWHAT

3 NOT MUCH AT ALL

10. To what degree do you think about another health profession as a career option not mentioned above?

1 2 3

List career _____

11. Do you think PGSHC will influence your future college choice?

1 2 3

12. Do you think PGSHC will influence your future college major choice?

1 2 3

13. To what degree do you think your chances are of getting in and passing the correct exams to go to a health professional school (medical, dental, pharmacy, graduate, etc.) after college?

1 2 3

14. Do you think PGSHC was an empowering experience?

1 2 3

15. Did PGSHC increase your passion toward health care?

1 2 3

16. Did PGSHC promote confidence, motivation and the development of your professional identity?

1 2 3

17. Did PGSHC provide opportunities for developing friendships and peer support networks?

1 2 3

18. Did PGSHC increase your ability to work in a team?

1 2 3

19. Did PGSHC provide guidance on practical issues about working in health profession (financial planning, constructing personal statements, resume building, interviews)?

1 2 3

20. Do you think the students who attended PGSHC were diverse?

1 2 3

21. Please provide comments, questions and/or concerns about PGSHC that will be helpful to the program in the future. Feel free to use the bottom of this form.

BIBLIOGRAPHY

1. *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, ed. Committee on Science, Engineering, and P. Policy. 2007, Washington, DC: The National Academies Press.
2. WebCASPAR. National Science Foundation 2007 [cited March 29, 2007]; Available from: <http://caspar.nsf.gov/includes/checkJavascriptAbility2.jsp;jsessionid=7F9FC8B23F45F03043B0DD648BDA035D?submitted=1>.
3. *Top 10 Most Popular Majors*. The Princeton Review 2006 [cited April 15, 2006]; Available from: <http://www.princetonreview.com/college/research/articles/majors/popular.asp>.
4. *No Child Left Behind*. U.S. Department of Education 2007 [cited March 30, 2007]; Available from: <http://www.ed.gov/nclb/landing.jhtml>.
5. Tai, R.H., et al., *Career choice. Planning early for careers in science*. Science, 2006. 312(5777): p. 1143-4.
6. Srinivasan, A., et al., *Preparing African Americans for careers in health care: the Jackson Heart Study*. Ethn Dis, 2005. 15(4 Suppl 6): p. S6-71-75.
7. Atwater, M.M., Colson, J., and et al., *Influences of a university summer residential program on high school students' commitment to the sciences and higher education*. J of Women and Minorities in Science and Engineering, 1999. 5(1555): p. 173.
8. Bleicher, R., *High school students learning science in university research laboratories*. Journal of Research in Science Technology, 1996. 40: p. 487-509.
9. Gibson, H. and C. Chase, *Longitudinal impact of an inquiry-based science program on middle school students' attitudes toward science*. Science Education, 2002. 86: p. 693-705.
10. Helm, E., J. Parker, et al., *Education and career path of LSU's summer science program students from 1985 to 1997*. Academic Medicine, 1999. 74: p. 336-337.

11. Richmond, G. and L. Kurth, *Moving from outside to inside: High school students' use of apprenticeships as vehicles for entering the culture and practice of science*. Journal of Research in Science Technology, 1999. 36: p. 677-697.
12. Markowitz, D.G., *Evaluation of the long-term impact of a university high school summer science program on students' interest and perceived abilities in science*. Journal of Science Education and Technology, 2004. 13(3): p. 395-407.
13. Knox, K.L., J. A. Moynihan, et al., *Evaluation of short-term impact of a high school summer science program on students' perceived knowledge and skills*. J Science Education and Technology, 2003. 12(4): p. 471-78.
14. Magnuson, C.S. and M.F. Starr, *How early is too early to begin life career planning? The importance of the elementary school years*. J Career Dev, 2000. 27(2): p. 89-101.
15. Arrington, K., *Middle grades career planning programs*. J of Career Dev, 2000. 27(2).
16. Bumgarner, S.D., B.H. Means, and M.J. Ford, *Building bridges: from high school to healthcare professional*. J Nurses Staff Dev, 2003. 19(1): p. 18-22; quiz 23-4.
17. Bross, T.M. and C. Smugar, *Understanding factors involved in college choice: implications for baccalaureate programs in nursing and allied health*. J Allied Health, 1986. 15(3): p. 193-200.
18. Marcelin, G.E., et al., *The Junior Fellows Program: motivating urban youth toward careers in health, science, and medicine*. J Urban Health, 2004. 81(3): p. 516-23.
19. Shannon, C.K., et al., *Evaluation of a required statewide interdisciplinary Rural Health Education Program: student attitudes, career intents and perceived quality*. Rural Remote Health, 2005. 5(4): p. 405.
20. Bell, R., et al., *Just do it? Impact of a science apprenticeship program on high school students' understandings of the nature of science and scientific inquiry*. Journal of Research in Science Teaching, 2003. 40: p. 487-509.
21. Freedman, M.P., *Relationship among laboratory instruction, attitude toward science, and achievement in science knowledge*. Journal of Research in Science Teaching, 1997. 34: p. 343-357.
22. Cunningham, S.L. and M.M. Kunselman, *University of Washington and partners' program to teach middle school students about neuroscience and science careers*. Acad Med, 1999. 74(4): p. 318-21.
23. Trusty, J., *Effects of high school course-taking and other variables on choice of science and mathematics college majors*. J Counseling Dev, 2002. 80(4): p. 464-474.

24. Zayas, L.E. and D. McGuigan, *Experiences promoting healthcare career interest among high-school students from underserved communities*. J Natl Med Assoc, 2006. 98(9): p. 1523-31.
25. Herr, E.L., *Career education for the gifted and talented: some observations*. Peabody Journal of Education, 1976. 53(2): p. 98-103.
26. Sedlacek, W.E. and D.O. Prieto, *Predicting minority students' success in medical school*. Acad Med, 1990. 65(3): p. 161-6.
27. *NCoGS Member Programs*. National Conference of Governor's Schools 2007 [cited February 27, 2007]; Available from: <http://ncogs.org/2ndgen/programs/programs.php>.
28. *Stanford Medical Youth Science Summer Residential Program*. Stanford University School of Medicine 2007 [cited March 19, 2007]; Available from: <http://smysp.stanford.edu/>.
29. *Health Professions Partnership Initiative (HPPI)*. Association of Schools of Public Health 2006 [cited March 30, 2006]; Available from: <http://www.asph.org/document.cfm?page=831>.
30. Thurmond, V.B. and L.L. Cregler, *Why students drop out of the pipeline to health professions careers: a follow-up of gifted minority high school students*. Acad Med, 1999. 74(4): p. 448-51.
31. *HCOP/HPPI Program Description*. University of Illinois at Chicago 2006 [cited March 30, 2006]; Available from: http://www.uic.edu/sph/diversity/HCOP_HPPI.htm.
32. *Health Careers Opportunity Program*. US Department of Health and Human Services 2006 [cited March 30, 2006]; Available from: <http://bhpr.hrsa.gov/diversity/hcop/default.htm>.
33. Smith, J., *Education and Public Health: Natural Partners in Learning for Life*. 2003, Association for Supervision and Curriculum Development.
34. *Medical Science and Technology Entry Program (Med-STEP)*. State University of New York at Buffalo 2007 [cited March 19, 2007]; Available from: <http://www.smbs.buffalo.edu/step/>.
35. *Area Health Education Centers (AHEC)/Health Education Training Centers (HETC)*. The National Area Health Education Center Organization 2007 [cited April 03, 2007]; Available from: <http://www.nationalahec.org/Directory/AHEC-HETCDirectory.asp>.
36. *NCoGS Mission Statement*. National Conference of Governor's Schools 2007 [cited February 27, 2007]; Available from: <http://ncogs.org/home/content/view/29/42/>.
37. *What is a Governor's School?* National Conference on Governor's Schools 2007 [cited February 27, 2007]; Available from: <http://ncogs.org/home/content/view/33/44/>.

38. *History and Overview*. Pennsylvania Governor's Schools of Excellence 2006 [cited April 22, 2006]; Available from: <http://pgse.cis.drexel.edu/info/overview.html>.
39. *PGSHC Partners*. Pennsylvania Governor's School for Healthcare 2006 [cited April 21, 2006]; Available from: <http://www.pitt.edu/~pgshc/partners.htm>.
40. *Selection Criteria*. Pennsylvania Governor's School for Healthcare 2006 [cited April 21, 2006]; Available from: <http://pgse.cis.drexel.edu/pgshc/index.html>.
41. *Intermediate Units*. Pennsylvania Governor's Schools of Excellence 2006 [cited April 21, 2006]; Available from: <http://pgse.cis.drexel.edu/info/ius.html>.
42. *Curriculum, Faculty & Facilities*. Pennsylvania Governor's Schools of Excellence 2006 [cited April 21, 2006]; Available from: <http://pgse.cis.drexel.edu/pgshc/index.html>.
43. Stewart, D.W. and P.N. Shamdasani, *Focus groups: theory and practice*. 1990, Newbury Park, CA: Sage Publications.
44. *Program Assessment Handbook: Guidelines for Planning and Implementing Quality Enhancing Efforts of Program and Student Learning Outcomes*. University of Central Florida 2004 [cited March 28, 2007]; Available from: http://iaaweb.ucf.edu/oeas/acad_prog_assess_handbook.pdf.
45. *WEAVE: A Quality Enhancement Guide for Academic Programs and Administrative and Educational Support Units*. Virginia Commonwealth University 2002 [cited March 29, 2007]; Available from: <http://www.vcu.edu/quality/pdfs/WEAVEManual2002.pdf>.
46. *Developing and Teaching a Course: Goals and Objectives*. University of Pittsburgh Center for Instructional Development and Distance Education 2007 [cited March 28, 2007]; Available from: http://www.pitt.edu/~cidweb/fds/lrn_goals.htm.
47. Stewart, D.W. and P.N. Shamdasani, *Focus groups: theory and practice*. 1990, Newbury Park, CA: Sage Publications.
48. *Health Career Exploration Program (HCEP)*. The Western New York Rural Area Health Education Center 2007 [cited March 19, 2007]; Available from: <http://www.r-ahec.org/k12programs/index.htm>.
49. *IRB Blanket Consent Forms for Students*. University of Arizona College of Medicine 2007 [cited March 21, 2007]; Available from: http://www.curricularaffairs.medicine.arizona.edu/CC/04-05minutes_files/Minutes%20-%20061505.pdf.
50. Frankland, J. and M. Bloor, *Some Issues Arising in the Systematic Analysis of Focus Group Materials*. Developing Focus Group Research: Politics, Theory and Practice, ed. R.S. Barbour and K. J. 1999, London: Sage Publications. 144-155.

51. Johnsen, S.K. and G. Ryser, *An overview of effective practices with gifted students in general education settings*. *Journal for the Education of the Gifted*, 1996. 20(3): p. 253-267.
52. Smedley, B.D., A.Y. Stith, and A.R. Nelson, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care.*, ed. N.A. Press. 2003, Washington, DC.
53. *Missing persons: Minorities in the health professions*. Sullivan Commission 2004 [cited February 6, 2007]; Available from:
<http://www.jointcenter.org/healthpolicy/docs/SullivanExecutiveSummary.pdf>.