

The following paper was presented at the Early Career Scholars in Geographic Education: A Research Symposium April 14, 2010, at National Geographic Society in Washington, D.C.

Supporting Geography Education: Effects of a Summer Academy on Secondary Geography Teachers

Ellen J. Foster

Department of Curriculum & Instruction
University of Mississippi

Accepted on December 1, 2010

Abstract

As part of a geography-based summer academy program, teachers served as mentors for teams of high school students interested in postsecondary education and geography. One component of the program evaluation includes the analysis of teacher understanding of geography and an investigation of the effects of professional development on the participating teachers. The program evaluation examined the effects of participation on teachers' understanding of geography. In addition to asking teachers to define geography, the pre- and post-program surveys included Likert-based questions aimed at assessing self-efficacy in geography. Changes were analyzed using two-tailed *t*-tests. In addition, teachers were asked about their involvement in professional development programs. Qualitative data analysis followed a grounded-theory model.

The research hypothesis proposed a positive correlation between teacher participation in continuing professional development and understanding of geography. However, correlations were not statistically significant. Instead, the research revealed a reasonable, but not statistically significant, level of professional engagement in teacher participants that appears to support continuing education in geography and geographic education. As a result, State alliances may consider requiring participants to conduct professional development sessions after program participation similar to the reported project,

which include presentations that will recruit future teacher participants and students to academic geography.

Keywords: Professional development, secondary education, geographic education

In July, 2002, the Grosvenor Center for Geographic Education and the Department of Geography at Texas State University-San Marcos hosted the first Geography Summer Academy for Minority Scholars (GeoSAMS) based on the principles identified by Boehm and Estaville (2001). Teachers throughout the state brought teams of one to three high school students to spend a week on campus learning more about geography. Initial research of the program included a longitudinal study of the high school age participants' understanding of applied geography and geographic careers – all in an age before GPS navigation applications were readily available for one's iPhone and Google Earth (Foster, 2006; Foster, 2009). To understand better the role of teachers in the GeoSAMS model, a qualitative analysis of teachers' attitudes and perceptions of the initial program provide insight into the program beyond the study of the high school students (Foster, 2010).

Since 2002, GeoSAMS has continued to expand the geographic understanding of high school students and provide professional development for their teachers. An analysis of the teachers and their continuing role in the GeoSAMS program was conducted in 2009 – the program's seventh year. Several questions that were not asked in the analysis of GeoSAMS 2002 guided the study of GeoSAMS 2009:

1. What effects do teaching experience and geography coursework have on teachers' definitions of geography?
2. Do teachers "learn" geography during participation in GeoSAMS?
3. Do teachers who participate in GeoSAMS share their knowledge gained during 2009 GeoSAMS professional development programs with colleagues?

Methodology

Participating teachers were given a pre-program survey at the beginning of the 2009 GeoSAMS program. The pre-program survey asked teachers to

briefly describe their definitions of geography, rank their knowledge and understanding of the topics to be covered during the program, and describe their participation in professional development programs (Table 1).

Teachers received a link to the post-program survey via SurveyMonkey.com in the Fall 2009. Post-program surveys were completed at the end of the first nine-week grading period of the 2009-2010 school year, approximately nine weeks after the summer program, to give teachers time to reflect and

Table 1

GeoSAMS Survey Questions.

Pre- and Post-Program Questions

Briefly explain your definition of geography.

Please rank your knowledge/understanding of the following:

- Water quality testing
 - Topographic maps
 - Orienteering
 - Map reading
 - GeoCaching
 - Field mapping
 - Google Earth
 - Careers in geography
-

Post-Program Questions

Prior to your participation in GeoSAMS 2009, have you ever conducted any geography-related formal in-service professional development sessions?

If yes, where and what audience did you have for your in-service?

Did you conduct any geography-related formal in-service or professional development sessions after your attendance at GeoSAMS 2009?

If yes, where and what audience did you have for your in-service?

Did you talk about the GeoSAMS 2009 program informally?

What part of GeoSAMS 2009 did you find most useful to your teaching?

What do you feel will be most useful to your future students as a result of your participation in GeoSAMS 2009?

Demographics

- No. of years teaching
 - No. of years teaching geography
 - Courses taught
 - Highest degree earned
 - Major field of study
 - No. of undergraduate hours in geography
 - No. of graduate hours in geography
-

Table 2

2009 GeoSAMS Teachers.

Mean	Max	Min	
Teaching Experience	7.33	20	1
Geography Teaching Experience	5.93	28	0
Undergraduate Coursework in credit hours (n=13)	19	56	3
Graduate Coursework in credit hours (n=2)	10.5	12	9
Years Attending a GeoSAMS Program (n=11)	3.55	7	1
Gender			
9 Men			
6 Women			

N=15

implement GeoSAMS 2009 strategies and lessons. In addition to the original questions, the post-program survey asked if they had shared any GeoSAMS 2009 related information with others.

In an effort to more clearly understand the types of teachers who sought out continuing professional development in geography and geographic education, and to understand the types of teachers who participate in student-teacher summer programs, demographic information from the teachers (N=15) was collected during the post-program survey as well (Table 2). GeoSAMS 2009 teachers had an average of 7.33 years of general teaching experience; 5.93 in teaching geography. Two teachers had graduate coursework in geography.

Data were analyzed using both qualitative and quantitative techniques. Teachers' definitions of geography were coded and analyzed using a grounded theory framework (Miles & Huberman, 1994; Creswell, 1998). The researcher coded components of definitions using the six essential elements of geography as categories: The World in Spatial Terms, Places and Regions, Physical Systems, Human Systems, Environment and Society, and Uses of Geography (Geography Education Standards Project 1994). Categories were given numeric values to be utilized during correlation analysis. Definitions with multiple components were totaled to develop a richness of definition score. For example, a definition that included components addressing "The World in Spatial Terms," "Physical Systems," and "Environment and Society" would have received a richness score of three.

The researcher conducted a one-tailed correlation analysis of the richness of teacher definition and teacher demographics using the demographic data and the results from the qualitative analysis of teacher definitions. The

researcher analyzed the Likert-based questions using a difference of means to determine if: a) teachers' knowledge of geography expanded as a result of the program and b) if the benefits were statistically significant. All statistical analyses were conducted in SPSS 17.0.

Results

Teachers' definitions of geography tended to reflect the world regional geography taught in high school classrooms (Table 3). Three responses of "The study of space" were not coded with "The World in Spatial Terms," because no additional information was provided to explain the comment or tie it to geography instead of astronomy. Many definitions included combinations of elements within definitions. The most popular elements referenced included Physical Systems, Human Systems, Environment and Society, and study of the Earth. One teacher provided the most complete definition of geography given (four elements) — "The study of the earth and everything on it; physical features, the climate, vegetation, people, and their culture. How the natural environment affects the people and their way of life." Table 4 shows selected pre- and post-program definitions of geography.

When demographic data were correlated to richness of definitions on the pre- and post-program surveys, no statistical significance was observed (at the

Table 3

Comparison of Definitions of Geography.

Components of Teachers' Definition of Geography	Pre-Program	Post-Program
Six Essential Elements		
World in Spatial Terms	2	4
Places and Regions	0	0
Physical Systems	6	6
Human Systems	3	5
Environment and Society	6	5
Uses of Geography	0	1
Study of the earth	4	7
Study of space	3	0
TOTAL	24	28

N=15

Table 4

Definitions of Geography.

Pre-Program	Post-Program
How humans interact with all of the spheres as they relate to various groups	The relationships/links/interactions "man/woman" has with his/her surrounding space/environment/niche and how all of this relates to their survival/existence in their short and long term time spans. This also includes abilities to problem solve and make connections in real world scenarios.
The study of the world: people, cultures, and the environment.	The study of the earth and everything on it; physical features, the climate, vegetation, people and their culture. How the natural environment affects the people and their way of life.
Study of space	Study of spatial [sic] arrangement of phenomena
Study of the earth's landforms, and physical features	The study of the earths [sic]ecosystems, culture, and landforms.
Is the science that studies cultures, landforms, water forms as well as way to conserve the earth.	The study of the earth's features and its cultures
Study of interactions in nature and how man interacts with nature	The study of the earth and its relationship with all living organisms and the effect they have on each other.
Study of space! Spatial thinking	Study of spatial perspective.
The study of the Earth, everything and everyone on it	The study of the Earth and everything on it.

$p = 0.05$ level). Teaching experience, geography teaching experience, coursework (undergraduate or graduate) in geography, and gender had no significant impact on the teachers' richness of definition, possibly a result of the small sample size. However, the Likert-based questions illustrated that participants learned something about all topics introduced during the GeoSAMS 2009 program (Table 5). Results were significant to $p = 0.05$ for all other topics except for "Google Earth" and "Richness of Definition in Geography."

The researcher created an additional pair, "Scores," to determine overall "learning." The scores for each content/skill category for each participant were totaled to create the variable "Scores" for both the Pre- and Post- surveys. Teachers reported learning the most about (in order of difference between the means): GeoCaching, water quality testing and topographic maps (tie); and field mapping and careers in geography (tie).

Table 5

Teacher Learning by Content/Skill.

Pairs (Pre-Post)	Difference between the Means	t	Significance (2-tailed)
Water Quality Testing	-0.933	-3.287	0.005
Topographic Maps	-0.933	-6.089	< 0.001
Orienteering	-0.857	-2.604	0.022
Map Reading	-0.467	-2.824	0.014
GeoCaching	-1.667	-4.620	< 0.001
Field Mapping	-0.867	-3.389	0.004
Google Earth	-0.400	-1.702	0.111
Careers in Geography	-0.867	-2.694	0.017
Scores	-19.067	-32.806	< 0.001
Richness of Definition	-0.400	-1.382	0.189

While not an anticipated measure of success, 60% of the teachers returned to GeoSAMS for at least a second year – an indication that GeoSAMS teachers might be more professionally engaged than their colleagues. The nine returning teachers each brought a team and continued their own professional development in geography and geographic education. Analytically, the workshop model had some impact on teachers due to repeated attendance.

One teacher returned to GeoSAMS 2009 for his seventh summer! He wrote:

I like coming back because it provides an opportunity for my students and myself to network with others from across the state to help in the understanding of geography. Mostly it is fun and challenging for all involved. We have established quite a rapport with all of the other student and teacher groups where many of us keep coming back to enjoy the experience.

It is not just about the material. It is truly a positive experience for all of my students who can't wait to go back and become involved at a higher level. Many of my students have come back to be peer counselors and then on to work in the Grosvenor Center to help pay their way to a college degree in geography.

Eighty percent of all participants conducted professional development sessions prior to their attendance in 2009 (Table 6). The fifteen teacher participants reported talking informally about GeoSAMS 2009 after returning to their respective campuses. Table 7 highlights ways that teachers talked about the program. Two teachers reported talking about the program with their students the fall of the 2009-2010 school year. Such conversations are traditionally considered a valuable recruiting tool for postsecondary education (Tinto 1988).

Table 6

Previous Inservices Conducted by GeoSAMS Teachers.

Audience	Percent	No. of Responses
Content area team meeting	21.62	8
Department-level in-service	13.51	5
Campus-level in-service	13.51	5
District-wide content area meeting	8.11	3
Regional workshop (i.e. ESC, FOG, GeoTech)	13.51	5
Statewide workshop (i.e. TAGE or TCSS)	18.92	7
National conference/workshop (i.e. NCGE or NCSS)	8.11	3
Total	97.29	37

N=12

Table 7

Informal Talk about GeoSAMS 2009.

Audience	Percent	No. of Responses
In the teacher's lounge	14.81	12
Department colleagues	17.28	14
Mentoring	11.11	9
Modeling	8.64	7
Other departments/teachers on campus	12.34	10
Department chair/leadership	13.58	11
Campus administration	9.87	8
District curriculum coordinators	9.87	8
Students	2.46	2
Total	99.96	81

N=15

Nine teachers reported formally presenting information from, or about, GeoSAMS 2009 and its curriculum at a variety of locations (Table 8). The most common venue for professional development in the semester following attendance was a content area team meeting (i.e., geography teachers within a social studies department).

Table 8

Workshops Held after GeoSAMS 2009.

Audience	Percent	No. of Responses
Content area team meeting	35.0	7
Department-level in-service	25.0	5
Campus-level in-service	15.0	3
District-wide content area meeting	10.0	2
Regional workshop (i.e. ESC, FOG, GeoTech)	5.0	1
Statewide workshop (i.e. TAGE or TCSS)	0.0	0
National conference/workshop (i.e. NCGE or NCSS)	10.0	2
Total	100	20

N=9

Conclusions

While no statistical correlations were evident using the demographic indicators selected, the research revealed that GeoSAMS 2009 teachers have a variety of experience levels. One factor was clear – GeoSAMS 2009 teachers were enthusiastic about geographic education and sharing their knowledge with colleagues and students possessing a remarkable level of professional engagement. Furthermore, teachers reported a greater knowledge and understanding of the geographic concepts and skills presented during the workshop. GeoSAMS 2009 teachers claimed to have learned from their experiences and demonstrated increased self-efficacy in geography. In spite of the small sample, the research confirmed an enthusiasm for geography and professional development in geography has been highlighted in larger studies on professional development in geographic education (Fullerm, 1989; Hill & Collop, 1998; Bednarz, 2002). Further study into the professional engagement of high school geography teachers may tell us more about how to recruit teachers for quality professional development programs. An investigation of the qualitative findings may highlight the traits that will make teachers effective

teacher consultants, ambassadors for K-12 geography education, and stronger advocates for postsecondary geography.

In 2002, one GeoSAMS 2002 student wrote, “[It was] so much more than high school [geography]!” Perhaps one way to change the perception of high school geography is to encourage teachers and students to participate in summer programs together. The key to evaluating such programs in geographic education may lie with the effective recruiting of students to postsecondary geography courses. Building on the “train the trainers” model, program personnel may opt to require participants to conduct an awareness session for secondary students highlighting real-world problems and careers in geography. State alliances and geography departments could use the information gained from the study of GeoSAMS 2009 to develop new ways of evaluating programs that combine professional development and recruiting for undergraduate and graduate students. Through mentoring and informal talks with teachers who attend quality professional development programs, secondary students gain a better understanding of applied geography and its career opportunities (Tinto, 1975; Tinto, 1988; Adeyemi, 2009; Foster, 2010).

References

- Adeyemi, M. B. (2009). Factors influencing the choice of geography as an optional subject: A case of a senior secondary school in Botswana. *Journal of Social Sciences*, 20(2), 101-104. Retrieved September 14 from <http://www.krepublishers.com/02-Journals/JSS/JSS-20-0-000-09-Web/JSS-20-2-000-09-Abst-PDF/JSS-20-02-101-09-854-Adeyemi-M-B/JSS-20-02-101-09-854-Adeyemi-M-B-Tt.pdf>
- Bednarz, R. S. (2002). The quantity and quality of geography education in the United States: The last 20 years. *International Research in Geographical and Environmental Education*, 11(2), 160-170.
- Boehm, R. G., & Estaville, L. E. (2001). A model for geography department recruitment of minority students. In G. A. Tobin, B. E. Montz, and F. A. Schoolmaster (eds.) *Papers and proceedings of the Applied Geography Conferences* held in Fort Worth, Texas November 14-17, 2001, 316-321. Denton, TX: Applied Geography Conferences.
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.
- Foster, E. J. (2006). *A Longitudinal Analysis of a Geography-based Minority Recruiting Model*. Unpublished Ph.D. Dissertation, Texas State University-San Marcos.

- Foster, E. J. (2009). Underrepresented populations' understanding and awareness of careers in geography. *Research in Geographic Education*, 11(1), 25-37.
- Foster, E. J. (2010). Creating geographers: Evaluating teacher participation in a geography-based summer academy. *Social Studies*, 101(5), 216-224.
- Fuller, G. (1989). Why geographic alliances won't work. *Professional Geographer*, 41(6), 480-484.
- Geography Education Standards Project. (1994). *Geography for Life: National Geography Standards 1994*. Washington, D.C.: National Geographic Research and Exploration.
- Grosvenor Center for Geographic Education. (2002). Geography summer academy for minority scholars. A grant proposal submitted to National Geographic Society Education Foundation.
- Hill, A. D., & Collop, E. L. (1998). Valuing professional development in the creation of the best geography teachers. *International Research in Geographical and Environmental Education* 7 (2): 142-145.
- Miles, M. B., Huberman, A. M. (1994). *Qualitative Data Analysis*. Thousand Oaks, CA: Sage Publications.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45(1), 89-125.
- Tinto, V. (1988). Stages of student departure: Reflections on the longitudinal character of student leaving. *Journal of Higher Education*, 59(4), 438-455.

Dr. Ellen Foster is an assistant professor at the University of Mississippi where she teaches undergraduate and graduate courses in secondary social studies education. Her research interests focus on geographic education, integrating social studies within the content areas, and recruitment and retention of underrepresented populations. Please direct all correspondence to Dr. Ellen J. Foster, Department of Curriculum & Instruction, University of Mississippi, PO BOX 1848, 325 Guyton Hall, University, MS 38677. E-mail: ejfoster@olemiss.edu.