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Teacher Professional Development: Using Local Resources to Engage Teachers and Students in Learning

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Teacher Professional Development: Using local resources to engage teachers and students in learning

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ABSTRACT

Background: Multiple studies on teacher learning indicate highly positive results when professional development is content-focused and coupled with active learning. In addition, an overall coherence to state and national standards can have a positive influence on enhancing the knowledge and skills of teachers, thus bringing about changes in teaching practice and K-12 student learning. For the past three years, site-based summer science courses, with spring preview and fall follow-up, were conducted to enhance the content knowledge and pedagogy of Georgia public school science teachers in the area of ecology as they became acquainted with the ecology of coastal Georgia. Teachers spent significant time investigating Jekyll Island, Sapelo Island, and Cumberland Island, as well as the St. Mary’s River and the Okefenokee National Wildlife Refuge. In this time of economic constraints, the weeklong on-site course provided teachers with video lesson segments for use in their classrooms, providing virtual standards-based fieldtrips for their students. Additional goals were to provide opportunities for investigation and inquiry, and to encourage the application of new knowledge and skills in the classroom setting.

Method: Mixed-method quantitative and qualitative tools were used to evaluate course impact on teacher participants and their K-12 students. Tools included science efficacy and outcome surveys, teacher-made artifacts and prepost tests.

Results: Science efficacy and outcome surveys indicated that the teacher participants increased their confidence for teaching ecological concepts. In addition, learning assessment (pre/post) demonstrated knowledge gains for both teacher participants and their K-12 students. Through the review of teacher-created field notebooks, lesson plans, laboratory activities, student assessment instruments and surveys, it is apparent that place-based activities are appropriate and useful in the K-12 setting. There is also evidence that teachers apply the place-based use of local resources once they return to their own classrooms.

Conclusion: The place-based science course provided effective professional development for teacher participants; the project resulted in additional benefits to K-12 students.

Teacher Quality Partnership Criteria
- Partnerships between:
  - Georgia Southern University College of Education:
    - teacher preparation unit
  - Georgia Southern University College of Science and Math, Department of Geology:
    - content unit
  - Additional local agencies:
    - U.S. Fish and Wildlife Service, Okefenokee National Wildlife Refuge
    - National Park Service, Cumberland Island National Seashore
    - Sapelo Island National Estuarine Sanctuary
    - Georgia Department of Natural Resources
    - High-need Local Educational Agency (LEA)

RESEARCH ON EFFECTIVE PROFESSIONAL DEVELOPMENT

Multiple studies on teacher learning indicate highly positive results when professional development
- encourages higher order thinking skills and laboratory practice,
- adheres to state and national standards, and
- is content-focused and coupled with active learning.

(Cleary-Hammond & Richardson, 2008; DeMont, Porter, Destinno, Binner, & Yoon, 2001; Kenny, Senn, and Purcell, 2000; Milken, 2000.)

METHODOLOGY AND DATA COLLECTION

Course Goals | Evaluation Questions | Evaluation Tasks
--- | --- | ---
#1. Enhance teacher attitudes and increase interest in teaching ecology | Did the course effect change in teachers’ attitudes toward and interest in teaching ecology? | Participant survey
#2. Increase teacher content knowledge about ecology | What effect did the course have on teacher content knowledge? | Pre/post content knowledge test
#3. Increase teacher use of effective hands-on strategies for teaching ecology | How did the course affect teacher pedagogy? | Teacher artifacts
#4. Increase students’ ecology content knowledge | What effect did the course have on student content knowledge? | Lab activities
#5. Increase teachers’ use of local resources by immersion and modeling | What are the advantages and limitations of on-site, place-based instruction using a local resource? | Assessments

ANALYSIS AND CONCLUSIONS

# 1. Did the course effect change in teachers’ attitudes toward and interest in teaching ecology?

The results from the Science Teacher Efficacy Belief Instrument (STEBI), suggest a statistically significant increase in teacher efficacy for teaching ecology indicating that place-based professional development for teachers can improve teacher efficacy for the teaching of ecology.

A paired samples t test revealed a reliable difference between the mean STEBI pre-score (M=3.72 and SD=.39) and the mean STEBI post-score (M=3.90 and SD=.36), t(13) = 2.35, p = .005, α = .05.

# 2. What effect did the course have on teacher content knowledge?

Place-based professional development from three different venues shows a positive learning outcome for all teacher participants suggesting that teacher participants gain valuable knowledge about ecology by learning it in a place-based venue.

Data from 2010 - 2012 (N=50) shows a positive learning outcome for all teacher participants. The mean achievement scores averaged 44.5 points higher between the pretest and posttest scores. These differences were statistically significant at the .05 level.

# 3. How did the course affect teachers’ pedagogy?

These results indicate an improvement in the classroom assessment scores of students whose teachers attended place-based professional development. Student results from content exams suggest a statistically significant increase in content knowledge.

A paired samples t test revealed a statistically reliable difference between the mean student achievement score on the pretest and the mean student achievement score on the posttest.

ACKNOWLEDGEMENTS

This project was supported through funds from the Improving Teacher Quality Program of the US Department of Education.

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