INQUIRY AND INSCRIPTION AS KEYS TO AUTHENTIC SCIENCE INSTRUCTION AND ASSESSMENT FOR PRESERVICE SECONDARY SCIENCE TEACHERS

A Dissertation
Prepared for the
Doctor of Education Degree
The University of Tennessee, Knoxville

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To the Graduate Council:

I am submitting herewith a dissertation written by Boyd Edward Lunsford entitled "Inquiry and Inscription as Keys to Authentic Science Instruction and Assessment For Prewserve Secondary Science Teachers." I have examined the final paper copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Education.

Claudia T. Melear, Major Professor

We have read this dissertation and recommend its acceptance:

[Signatures]

 Accepted for the Council:

[Signature]

Vice Provost and Dean of Graduate Studies
Abstract

This research project consists of a qualitative study of a group of preservice science teachers who, at the time of the study, were enrolled in a graduate level course designed especially to acquaint them with the skills of doing and teaching science by way of scientific inquiry. Most students in the study held bachelor's degrees in some aspect of science, mostly biological sciences. The students were evaluated in the course by way of authentic assessment techniques, including the scientific inscriptions they constructed as they carried out their inquiry activities. The students constructed more than 1500 inscriptions in the course and used them in appropriate ways. Evidence suggests that an inscription rubric, based on criteria used by professional scientists in the ways they make and use inscriptions, and explicit instruction about inscriptions in professional science helped students maximize their use of inscriptions. The students showed an understanding of the importance of a well-prepared inscription and of the collaborative, social nature of authentic science. During the study, the researcher concluded that the students entered with poorly developed skills relating to the Nature of Science and Process domains of Science Education. The students completed several inquiry projects and learned a variety of content, laboratory skills and scientific processes. The students said they believed that the authentic assessment techniques used to evaluate their work were more valid than traditional paper and pencil tests. The students' ability to design and carry out successful experiments over time improved during the study. They attributed this to participating in inquiry and in maintaining inscriptions related to their work.