Journal of Curriculum and Instruction (JoCI)
December 2014, Vol. 8, No. 2, Pp. 36-67
http://www.joci.ecu.edu

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

Comparing the Impact of a High School Exit Examination on Biology Teachers' Instructional Practices

Kenneth E. Vogler
G. Nathan Carnes
University of South Carolina

Abstract

The purpose of this study was to compare the impact of a high school exit examination with different consequences attached to the results on biology teachers' instructional practices in Mississippi and Tennessee. Self-reported survey data were obtained from a representative sample of teachers who taught the same content tested on their respective state's high-stakes graduation examination. An analysis showed that both groups used a balance of student-centered (e.g., critical-thinking activities) and teacher-centered practices (e.g., lectures) on average at least 2 to 4 days per week. At least 83% of participants indicated an interest in helping their students earn test scores required for graduation and improving graduation examination scores as factors that influenced their use of specific practices and tools. This study presents a detailed picture of which practices were used and factors influencing their use by biology teachers who prepare students for state-mandated examinations with different consequences attached to results.

Calls for accountability within the education community have resulted in an increase in high-stakes testing, particularly at the high school level in the form of exit exams (Yell, Katsiyannis, & Collins, 2012). Several years ago, Britton and Schneider (2007) indicated that high school exit exams have continued to attract increasing amounts of attention. As expected, there are individuals who advocate for high-stakes testing and those who oppose it. The following review summarizes perspectives that support high stakes testing and accountability systems that include it and views that oppose these practices.

Testing Viewpoints

Proponents of testing and accountability systems generally fall into two camps (Firestone, Monfils, Camilli, Schorr, Hicks, & Mayrowetz, 2002). The first group focuses on the accountability of testing programs. This group believes that the way to improve education is to test and use the results to hold teachers and students accountable for their actions. The form of the assessment is not as important as the rewards or sanctions attached to the test results (National Alliance of Business, 2000).

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doi:10.3776/joci.2014.v8n2p36-67

An opposing viewpoint contends that the use of testing and accountability systems is a sure way to improve education. For this group, the key to improving education is not the rewards or sanctions attached to the test results, but the tests themselves. They contend that tests can serve as "powerful curricular magnets" (Popham, 1987, p. 680), and that standardized assessments can guide the educational system to be more productive and effective (Popham). This group also believes that the use of assessments, such as portfolios, performance assessments, and other forms of authentic tasks, will spur teachers to focus on more than just facts and procedures and help students construct knowledge and develop higher level thinking skills (Baron & Wolf, 1996; Bracey, 1987a, 1987b; Newmann & Associates, 1996; Resnick & Resnick, 1992; Rothman, 1995).

Opponents of testing and assessment systems believe that, contrary to the idea of promoting critical level thinking, state-level assessments force teachers to focus on facts and procedures without meaning or context (Firestone et al., 2002; McNeil, 2000; Shaeffer, 2012). They argue that these high-stakes assessment systems create negative side effects such as narrowing and dumbing down the curriculum, de-skilling teachers, pushing students out of school, and generally inciting fear and anxiety among both students and educators (Darling-Hammond & Wise, 1985; Gilman & Reynolds, 1991; Jones & Whitford, 1997; Madaus, 1988a, 1988b; McNeil, 2000; Shepard, 1989, March). According to opponents, these side effects outweigh any possible benefits of measurement-driven reform.

Over the past few years, increasing numbers of educators have undertaken actions against high stakes testing. For example, the American Federation of Teachers (AFT) unanimously approved a resolution against this high stakes practice at its 2012 annual convention, indicating that the focus on standardized tests undermines the American education system. Instead, testing should be used to inform, not impede, classroom instruction. This group has enlisted the support of parents and other members of the education community. While protests against high stakes testing are not new, the surge in the number and strength of the opponents are unprecedented (Schaeffer, 2012).

Between the proponents and opponents of testing and accountability systems lies a third position. According to advocates of this perspective, the effects of testing and assessment systems depend not on the tests themselves, but on factors relating to their implementation (Firestone et al., 2002; Grant 2003). These factors include how tests are interpreted by teachers and administrators, the content knowledge assessed, and the opportunities afforded to teachers to learn about and to try out instructional practices that will help prepare students for the testing and assessment system (Borko & Putnam, 1995; Cohen & Hill, 1998; McLaughlin, 1990; Reich & Bally, 2010; Saxe, Franke, Gearhart, Howard, & Michele, 1997; Supovitz, Mayer, & Kahle, 2000; Vogler, 2003).

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Relationship between Testing and Instruction

As policymakers continue to authorize the use of statewide examinations to assure that educators (e.g., administrators and teachers) are being held accountable for the education of students in their care, the impact of these examinations on teachers' instructional practices seems to be a relevant concern, with, as of yet, no clear consensus as to what the impact is. Although researchers such as Barksdale-Ladd and Thomas (2000), Faxon-Mills, Hamilton, Rudnick, and Stecher (2013), Goodwin (2014), Jones and Johnston (2002), McNeil (2000), Vogler (2002), and Yarbrough (1999) have found that teachers changed their instructional practices in response to state accountability examinations, there is still no clear understanding about the nature and intensity of this relationship (Firestone et al., 2002; Grant, 2001; Grant, 2003). Factors such as subject and grade level taught, personal beliefs, type of high-stakes assessment, and professional development all have the potential to impact this relationship in varying degrees (Cimbricz, 2002; Jones, Jones, & Hargrove, 2003).

Teachers have been acutely aware of the narrow focus on student test results that have stalled efforts to improve education for all (Bridwell, 2012; Goodwin, 2014; Nichols & Berliner, 2007; Nichols & Valenzuela, 2013; Rebora, 2012). The high-stakes attached to state-mandated testing programs have included consequences such as public reporting of test results, prevention of grade-to-grade promotion, and possible takeover of schools that continue to demonstrate low levels of student performance. The pressure to produce at least adequate student test results, although felt in varying degrees by all teachers, may be the greatest for those who teach the same content tested on their state's End-of-Course exit examination (otherwise known as a *high school graduation examination*). On one hand, these teachers want to use teaching practices that make their classes interesting, develop students' higher-level thinking skills, and spark an interest in the subject and why it is relevant; on the other hand, these teachers have a responsibility to prepare students for the state accountability examination. Unlike standards-based examinations that test content taught in more than one course, End-of-Course examinations test what an instructor may teach in a specific content course (see Center on Educational Policy, 2005). Failure to do so may lead to severe consequences for their students, their school, and themselves, including low rates of high school graduation and diminished school funding (see Nichols & Berliner, 2007; Nichols & Valenzuela, 2013; Smith, 1991).

Definition of Student-Centered and Teacher-Centered Instruction

In consideration of our central question related to the impact of a high school exit examination on high school biology teachers' instructional practices, we define *student-centered* and *teacher-centered* instruction. In providing these definitions, we do not promote one type of instruction over another, but highlight the distinction between the two. Student-centered instruction is aligned with the National Science Education Standards (NSES; National Resource Council [NRC], 1996). Even though the

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doi:10.3776/joci.2014.v8n2p36-67

Framework for K- 12 Science Education (NRC, 2012) was neither fully developed nor disseminated at the time of our study, this recent set of guidelines are in concert with our characterization of student-centered instruction. Specifically, both reform documents call for instructional practices that provide opportunities for students to generate authentic questions, plan and carry out investigations, formulate explanations in light of available evidence, and engage in evidence-based arguments (Bybee, 2011; Bybee, 2013; NRC, 1996; NRC, 2012).

Brooks and Brooks (1993) have identified differences between a student-centered and teacher-centered classroom. Within student-centered classrooms, teachers allow students to work in groups to learn from one another as well as the teacher, as opposed to having students work alone. They allow students to use real world raw data and manipulatives as opposed to primarily using textbooks and workbooks. Teachers act as facilitators or guides as opposed to presenting themselves as experts who dispense the *correct* information. They present curriculum with an emphasis on big concepts as opposed to an emphasis on basic facts and skills. In short, student-centered classrooms provide a learning environment in which students are participants, consumers, and are actively engaged in their learning.

Teacher-centered classrooms, on the other hand, provide a learning environment in which students are relatively passive recipients of information. As strenuously argued by researchers (e.g., Clark, Kirschner, & Sweller, 2012), teacher-centered instruction "is more effective and more efficient than partial guidance" (p. 6). Thus, this perspective advocates the use of fully guided teacher-centered instruction in science classrooms (see Clark, Kirschner, & Sweller, 2012; Hirsch, 1996; Kirschner, Sweller, & Clark, 2006).

Mississippi's High School Graduation Examination

In 2000, under the Mississippi Board of Education Policy IHF-1, the Subject Area Testing Program (SATP) became a requirement for high school graduation (Mississippi Department of Education, 2004a). Among other reasons, this test program was designed to evaluate the performance of Mississippi schools and districts in teaching the Mississippi Curriculum Framework (Marchette, 2003). The SATP consists of end-of-course, criterion-referenced tests in Algebra I, Biology I, United States History from 1877-Present, and English with a writing component (Mississippi Department of Education, 2004b). In 2002, after a standard-setting and a phase-in process, the science portion of the SATP was completely implemented (Mississippi Department of Education, 2004c). Students must pass the Biology I examination as a requirement for high school graduation.

Tennessee's High School Graduation Examination

In 1998, under Education Policy TCA 49-1-608 and TCA 49-6-600, the Tennessee Department of Education accepted the recommendation of the High School Testing Advisory Committee to develop and phase in, beginning with the 9th grade in

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

2001-2002 school year, End-of-Course examinations for ten high school courses (Tennessee Department of Education, 2005). In three subjects, Algebra I, Biology I, and English II, students had to pass the examinations as a requirement for high school graduation. These would later be called the Gateway Examinations. The other seven End-of-Course examinations were given in the areas of Math Foundations, Geometry, Algebra II, Physical Science, Chemistry, English I, and U.S. History. Also, the testing policy included the following points: (a) the testing programs were to be fully implemented by the 2004-2005 school year; (b) results of the examinations were to be given to the teacher in a timely fashion; and (c) although local boards of education would determine how to use the examination results, the results were required to count at least 15% of the student's grade in that subject for the semester in which the test was administered (Tennessee Department of Education, 2005).

Purpose of the Study

The purpose of this study was to compare the instructional practices of biology teachers from two Southeastern states, Mississippi and Tennessee, and factors that influenced their teaching biology content tested on their respective state's high-stakes high school exit examination. We examined one central question: In what manner does a high school exit examination with consequences attached to the results influence high school biology teachers' instructional practices? In order to ascertain the answer, we considered four questions.

1. What instructional practices do high school biology teachers use?
2. How often do high school biology teachers use these instructional practices?
3. What factors influenced their use?
4. Are there differences in the instructional practices used and factors influencing their use between teachers from different states with different consequences attached to the results of the exit examination? If so, what are they?

Method

Survey Instrument

For this study, we developed a survey instrument consisting of Likert-type and open-ended items (see Appendix). Part I of this research tool contained items pertaining to instructional practices used and the extent to which they are used. Part II contained items pertaining to factors influencing instructional practices used, and Part III contained items pertaining to demographic information. Also, the end of Part I asked if and how much instructional time was spent preparing students for the accountability examination. Finally, there was a section called *Comments* that offered respondents an opportunity to

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

provide more information about the instructional practices they used to prepare students for the accountability examination.

Survey Instrument's Validity and Reliability

We took two approaches to ascertain the validity and reliability of the survey instrument. First, we sought evidence for the content validity of the 54 items on the initial draft of the survey instrument. As our investigation was part of a larger study about the impact of state-mandated examinations on English, science, mathematics, and social studies teachers' instructional practices, 36 high school teachers (nine English, nine science, nine mathematics, and nine social studies) reviewed the items on the survey instrument for clarity and completeness in coverage of the instructional practices used and possible influences. Using their recommendations, the number of items on the survey instrument was reduced to 48.

Second, 34 different high school teachers (nine English, seven science, nine mathematics, and nine social studies) completed the revised 48-item survey instrument. These same 34 teachers completed the revised survey instrument again following a three-week interval. Reliability was assessed by comparing each teacher's responses. A Pearson's product-moment correlation coefficient was used as the test-retest reliability measure. The correlation coefficient was .82, indicating a high positive relationship and above the .70 needed to insure the reliability of the survey instrument (see McMillan & Schumacher, 2001). Sixty-four percent (64%) of the teachers had exact matches for all items; 88% of the matches were within one point on the six-point scale, and 92% of the matches were within one point on the five-point scale.

Sample Selection

We used a convenience sample of Mississippi and Tennessee high school biology teachers that reflected the demographics within each state. First, school systems were grouped according to each state's geographic region: East, Middle, and West. Second, the school systems in each region were ranked according to student success on the latest state accountability examination—SATP in Mississippi and Tennessee in Tennessee. Quartiles were generated using this ranking. At least four, but no more than six, school systems from each quartile participated in the study. This sampling design allowed us to compare and generalize the survey response sample to the population as a whole (see Muijs, 2004). Individual teacher participation was voluntary.

In Mississippi, 55 school systems, out of a total sample of 63 (87.0%), agreed to participate in the study. All high school Biology I teachers from each participating school system were given a cover letter and the survey instrument by their principals or school designate. The cover letter explained the nature of the study and other aspects (e.g., how to calculate instructional time spent on test preparation). The content covered in the Biology I course, according to the Mississippi State Framework, was the

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doi:10.3776/joci.2014.v8n2p36-67

same science content tested on the SATP. One hundred six (106) teachers (61.3%) of the total sample of science teachers elected to complete the survey instrument.

In Tennessee, 53 school systems, out of a total sample of 62 (85.0%), agreed to participate in the study. The same procedure as in Mississippi was followed: All high school Biology I teachers from each participating system received the cover letter with details about the study. The content covered in this science course, according to the Tennessee State Framework, was the same science content tested on the Gateway Examination. One hundred forty-one (141) teachers (60.2%) of the total sample completed the survey instrument.

Comparison of Survey Sample and State Teaching Population

We compared the Mississippi and Tennessee survey respondents with each state's teaching population using data obtained from Part III of the survey instrument and the Mississippi and Tennessee Department of Education. Table 1 is a comparison of the frequency distribution between the Mississippi and Tennessee response sample and the Mississippi and Tennessee high school Biology I teacher population for gender, education, and teaching experience.

Table 1
Comparison of Sample and Mississippi and Tennessee High School Biology I Teacher Population for Gender, Education, and Teaching Experience

	High School Biology I Teacher Population							
	Mississippi				Tennessee			
	Sample		State		Sample		State	
Demographic Variable	%	n	%	n	%	n	%	n
Gender								
Female	73.6	78	70.3	345	58.9	83	62.4	504
Male	26.4	28	29.7	146	41.1	58	37.6	304
Education								
Bachelor's	60.0	63	62.1	305	35.5	50	37.7	305
Master's	36.2	39	34.0	167	63.1	89	56.2	454
Specialist's	03.8	04	03.9	019	00.7	01	04.1	033
Doctorate	00.0	00	00.0	000	00.7	01	02.0	016
Teaching Experience								
0-6 Years	38.7	41	42.7	210	22.0	31	not available	
7-14 Years	24.5	26	22.5	110	32.6	46	not available	
15-24 Years	20.7	22	21.2	104	20.6	29	not available	
25+ Years	16.0	17	13.6	067	24.9	35	not available	

With a few exceptions, Table 1 shows that participants in the present study were representative of the Mississippi and Tennessee high school Biology I teaching

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doi:10.3776/joci.2014.v8n2p36-67

population in terms of gender and education, and the Mississippi high school Biology I teaching population in terms of teaching experience. At the time of our study, the Tennessee Department of Education had no information regarding years of teaching experience.

A principal component analysis was conducted on the instructional practices and tools listed in the survey instrument. The results of this analysis are shown in Table 2.

Table 2
Factor Analysis

Item	Student-Centered Instruction	Teacher-Centered Instruction
Problem-Solving Activities	.82	
Creative/Critical Thinking	.77	
Newspaper/Magazines	.72	
Lessons on Current Events	.69	
Project-Based Assignments	.68	
Computers/Internet	.68	
Inquiry/Investigation	.66	
Charts/Webs/Outlines	.63	
Role Playing	.61	
Cooperative Learning/Group Work	.59	
Interdisciplinary Instruction	.59	
Discussion Groups	.58	
Response Journals	.56	
Group Projects	.53	
Computers/Ed Software	.52	
Lab Equipment	.52	
Rubrics or Scoring Guides	.51	
Audiovisual Materials	.50	
Writing Assignments	.49	
Supplementary Materials	.45	.34
Open-Response Questions	.44	
Visual Aids	.42	
Modeling	.39	
Calculators	.37	.31
Textbooks		.77
Textbook Based Assignments		.74
Worksheets		.68
Lecturing		.62
True-False Questions		.55
Multiple Choice Questions		.46
Eigenvalue	4.3	2.1
% of variance explained	42.4	28.6
Alpha	.88	.77

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

Components with eigenvalues greater than 1.0 were retained and rotated with a varimax rotation. The analysis revealed that two factors accounted for 71% of the variance. These factors were labeled student-centered instruction (24 items) and teacher-centered instruction (6 items). Two items (Supplementary Materials and Calculators) loaded on both factors (using .30 as the cut-off point); however, in each case, the second loading was lower than the first one (see Table 2). The values of alpha for the two subscales were a satisfactory .88 and .77, respectively.

Results

Results showed a balance of student-centered and teacher-centered practices and tools; teachers in both states reported that they most often used visual aids, supplementary materials, lab equipment, and open response questions, as well as teacher-centered practices such as multiple choice questions, textbooks, lecturing, textbook-based assignments, and worksheets. Teachers reported that they least used student-centered instructional practices or tools such as response journals, role playing, discussion groups, project-based assignments, and interdisciplinary instruction. A minimal relationship was found between the type of instructional practice used, either student-centered or teacher-centered, and time spent on test preparation; 88.6% of the total sample of Mississippi teachers and 77.3% of the total sample of Tennessee teachers acknowledged spending class time preparing students for the high school exit examination. Comparing the instructional practices used by the amount of time respondents of both states spent preparing students for the examination yielded only minor relationships between the two variables. For instance, teachers spending time preparing students for the high school exit examination were more likely to use a combination of student-centered and teacher-centered practices such as textbooks, textbook-based assignments, lecturing, cooperative learning/group work, and supplementary materials than those spending no time preparing students for the examination. Over 83% of teachers from both states felt that two factors influenced their use of instructional practices: their interest in helping their students attain test scores that enabled them to meet high school graduation requirements and their desire to help their respective schools improve high school graduation examination scores. Other factors that were less influential included format of the examination, personal desire, and their beliefs in best instructional practices.

Using a Balance of Student-Centered and Teacher-Centered Practices

Part I of the survey instrument was designed to answer the study's first two guiding questions and part of the fourth guiding question. Table 3 compares the practices Mississippi and Tennessee survey respondents reported using *regularly* or

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

mostly.[1] It also notes statistically significant differences between respondents from the two states.

Table 3
Comparison of Mississippi and Tennessee High School Biology I Teachers' Use of Instructional Practices or Tools: Regularly *or* Mostly

Instructional Practice or Tool	Mississippi Total %	Tennessee Total %	Sig.	Effect
Multiple Choice Questions	97.2	85.8	.002**	.19
Textbooks	84.9	85.1	.965	.00
Visual Aids	83.0	75.8	.174	.08
Supplementary Materials	82.1	85.1	.522	.04
Lecturing	78.3	79.4	.829	.01
Lab Equipment	78.3	76.8	.782	.06
Open-response Questions	75.5	55.3	.001**	.20
Textbook-based Assignments	74.6	81.6	.183	.08
Charts/Webs/Outlines	72.6	48.7	.439	.04
Worksheets	71.7	48.7	.002**	.16
Audiovisual Materials	69.8	65.2	.450	.04
Cooperative Learning/ Group Work	68.0	65.2	.659	.02
Writing Assignments	59.4	39.0	.001**	.20
Creative/Critical Thinking Questions	58.4	56.8	.783	.01
Problem-solving Activities	53.8	53.2	.928	.00

Note. *$p < .05$; **$p < .01$.

An analysis of Table 3 shows that survey respondents from both states used a balance of student-centered and teacher-centered practices. For example, of the first ten instructional practices or tools they reported using most, five used a student-centered approach (visual aids, supplementary materials, lab equipment, open-response questions, charts/webs/outlines) and five were of a teacher-centered nature (multiple choice questions, textbooks, lecturing, textbook-based assignments, worksheets). Table 3 also shows Mississippi respondents used significantly more multiple choice questions, open-response questions, worksheets, and writing assignments than respondents from Tennessee, but the effect size shows these are relatively weak

[1] Instructional practices or tools used regularly and often means respondents either circled *4* for RU (regularly) or *5* for M (mostly) on Part I of the survey instrument. Instructional practices or tools used less often or not at all means respondents either circled *1* for D (don't use), *2* for R (rarely), or *3* for O (occasionally) on Part I of the survey instrument.

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doi:10.3776/joci.2014.v8n2p36-67

relationships. In summary, this table shows respondents in both states used a balance of student- and teacher -centered instruction.

Table 4 compares the practices Mississippi and Tennessee respondents reported using occasionally, rarely, or not at all.

Table 4
Comparison of Mississippi *and Tennessee High School Biology I Teachers' Instructional Practice or Tool:* Occasionally, Rarely, *or* Don't Use

Instructional Practice or Tool	Mississippi Total %	Tennessee Total %
Response Journals	90.6	93.6
Calculators	87.5	75.2
Role Playing	80.2	94.3
Newspapers/Magazines	80.2	85.1
True-False Questions	73.6	58.1
Lessons-based on Current Events	71.5	70.1
Discussion Groups	69.8	60.3
Project-based Assignments	64.2	70.2
Computer/Ed Software	62.2	60.6
Interdisciplinary Instruction	61.3	73.9
Computer/Internet	60.3	65.0
Rubrics or Scoring Guides	52.4	72.5

Whereas Table 3 shows that respondents used a balance of student-centered and teacher-centered practices, an analysis of the practices respondents reported using less often or not at all presents a slightly different picture. Table 4 shows respondents in both states reported spending the least amount of instructional time using student-centered instructional practices and tools such as response journals, role playing, newspapers/magazines, discussion groups, project-based assignments, computers/ educational software, computers/internet, and interdisciplinary instruction. Of the 12 instructional practices and tools respondents acknowledge using occasionally, rarely, and not at all, only one (true-false questions) can be considered instruction in line with a teacher-centered learning approach.

Tables 3 and 4 showed a pattern pertaining to the type of instructional practices used by respondents and the extent to which they were used. Respondents most often used a balance of teacher-centered and student-centered instructional practices and tools in their classrooms, including multiple choice questions, visual aids, textbooks, supplementary materials, lecturing, lab equipment, textbook-based assignments, open-response questions, worksheets, and charts/webs/outlines. Teachers from both states reported least using mostly student-centered instructional practices and tools, including

Journal of Curriculum and Instruction (JoCI)
December 2014, Vol. 8, No. 2, Pp. 36-67
http://www.joci.ecu.edu

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

response journals, role playing, newspapers/magazines, discussion groups, project-based assignments, computers/educational software, computers/Internet, and interdisciplinary instruction.

Relationship between Instructional Practices and Time Spent on Test Preparation

Questions #31 and #32 in the survey instrument (see Appendix) asked about preparing students for the accountability examination. Ninety-four respondents, 88.6% of the total sample of Mississippi teachers, and 109 respondents, 77.3% of the total sample of Tennessee teachers, acknowledged spending instructional time preparing students for the high school exit examination. Table 5 provides a comparison of the instructional practices and tools regularly and mostly used by the Mississippi and Tennessee respondents spending no, 1 day to 2 months, and over 2 months of instructional time preparing students for the high school exit examination.[2]

Table 5
Comparison of Regularly *and* Mostly Use *Instructional Practice or Tool by State and Respondents' Instructional Time Spent Preparing Students for Exam*

	Mississippi			Tennessee		
	% Time Spent Preparing Students for Exam					
Instructional Practice or Tool	None[a]	1-2 Days Months[b]	Over 2 Months[c]	None[d]	1-2 Days Months[e]	Over 2 Months[f]
Multiple Choice Questions	100.0	100.0	95.9	90.6	75.0	87.7
Lab Equipment	100.0	73.7	75.7	83.9	50.0	82.7
Audiovisual Materials	100.0	57.9	27.0	50.0	35.7	28.4
Visual Aids	100.0	84.2	79.7	78.1	64.3	79.0
Charts/Webs/Outlines	91.7	57.9	73.0	68.8	64.3	69.1
Worksheets	75.0	42.1	78.4	71.9	71.4	71.3
Textbooks	66.7	73.7	90.5	90.6	92.9	80.2
Cooperative Learning/ Group Work	66.7	73.7	66.2	56.3	57.1	71.6
Writing Assignments	66.7	64.9	36.8	34.4	35.7	42.0
Textbook-based Assignments	66.7	57.9	81.1	81.3	92.9	77.8
Lecturing	66.7	57.9	85.1	75.0	82.1	80.2
Creative/Critical Thinking Questions	66.7	57.9	58.1	65.6	53.6	54.3
Open-response Questions	50.0	89.5	77.0	53.1	57.1	55.6
Supplementary Materials	50.0	84.2	86.5	78.1	82.1	88.9
Problem-solving Activities	41.7	42.1	58.1	65.6	32.1	55.6

Note. [a]n = 12. [b]n = 19. [c]n = 75. [d]n = 32. [e]n = 28. [f]n = 81.

[2] [2]The preparation time category was *collapsed* into *no*, *1 day to 2 months*, and *over 2 months* in order to ensure cell numbers sufficient to meet minimum requirements for a chi-square analysis. Crosstabulations and chi-square analyses were conducted to determine if there were any significant differences between the instructional practices used or not used and the *collapsed* preparation time categories.

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

An inspection of Table 5 reveals that there was a minimal relationship between instructional practices used most often by Mississippi and Tennessee respondents and the amount of time spent on test preparation. Respondents from both states who spent no time preparing students for the exit examination were more likely to use student-centered practices and the teacher-centered practice multiple choice questions than teachers who spent time preparing students for the examination. Also, teachers from both states who spent time preparing students for the exit examination were more likely to use student-centered practices and teacher-centered practices than those who spent no time preparing students for the examination. Additionally, teachers from both states who spent the most time preparing students for the high school exit examination were more likely to use supplementary materials than those who spent one day to two months or no time preparing students for the examination.

Table 5 also shows a number of differences between the instructional practice used most often by respondents of both states and the amount of time spent on test preparation. For instance, in Mississippi, the student-centered practices of visual aids and charts/webs/outlines were used most often by respondents who spent no time preparing students for the examination; in Tennessee, they were used most often by teachers who spent the most time preparing students for the examination. Teacher-centered practices were used most often by Mississippi respondents who spent the most time preparing students for the examination; in Tennessee, these practices were used most often by respondents who spent either no time or 1 day to 2 months preparing students for the exit examination.

Influence of Testing on Instruction

Part II of the survey instrument was designed to answer the study's third guiding question and part of the fourth guiding question: factors influencing the instructional practices and tools respondents used. Table 6 compares the factors influencing the instructional practices and tools Mississippi and Tennessee respondents reported using. It also notes statistically significant differences and effect sizes between respondents from the two states.

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ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

Table 6
Comparison of Influence Factors Reported by Mississippi and Tennessee High School Biology I Teachers: Agree *or* Strongly Agree

Item	Mississippi Total %	Tennessee Total %	Sig.	Effect
37. Interest in helping my students attain test scores that will allow them to graduate high school	96.2	92.9	.264	.07
36. Interest in helping my school improve high school graduation exam scores	95.4	83.7	.004**	.18
35. Format of the exam	81.2	65.2	.006**	.17
33. Personal desire	77.4	86.6	.060	.11
41. Interactions with colleagues	77.3	65.2	.039*	.13
34. Belief these are the best instructional practices	77.3	90.1	.006**	.17
38. Interest in avoiding sanctions at my school	65.1	43.3	.001**	.21
42. Staff development in which I have participated	67.0	68.1	.854	.01
40. Interaction with school principal(s)	46.2	38.3	.211	.07
43. Interactions with parents	38.6	32.7	.324	.06
39. Interest in obtaining a monetary award for my school	23.8	15.6	.105	.10

Note. *$p < .05$; **$p < .01$.

An examination of Table 6 reveals that over 92% of teachers from both states felt that an “interest in helping my students attain test scores that will allow them to graduate high school” (item 37) was a factor influencing their use of instructional practices. For respondents from Mississippi, this factor was followed by an “interest in helping my school improve high school graduation examination scores” (item 36), “format of the examination” (item 35), and “personal desire” (item 33). For respondents from Tennessee, the factor with the second greatest total percentage of *agree* and *strongly agree* was “belief these are the best instructional practices” (item 34) followed by “personal desire” (item 33) and “interest in helping my school improve high school graduation examination scores” (item 36). Less than half of the respondents from both states felt that “interactions with school principal(s)” (item 40), “interactions with parents” (item 43), and “interest in obtaining a monetary award for my school” (Item 39) were factors influencing their instructional practices.

Table 6 shows that 5 of the 11 influence factors listed had statistically significant differences between the Mississippi and Tennessee respondents. This indicates that all these factors with the exception of “belief these are the best instructional practices” had

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doi:10.3776/joci.2014.v8n2p36-67

more influence on respondents from Mississippi than Tennessee. While factors "interactions with colleagues" and "belief these are the best instructional practices" are personal beliefs, the other three factors, "interest in helping my school improve high school graduation exam scores," "format of the examination," and "interest in avoiding sanctions at my school," are examination-related and had more of an influence on respondents from Mississippi than Tennessee.

Finally, we compared the influence factors by the respondents' state and by the amount of time spent preparing students for the accountability examination. Table 7 is a comparison of the influence factors by the Mississippi and Tennessee respondents spending *no, 1 day to 2 months*, and *over 2 months* of instructional time preparing students for the accountability examination.

Table 7
Comparison of Influence Factors by State and Respondents' Instructional Time Spent Preparing Students for Exam: Agree *or* Strongly Agree

	Mississippi			Tennessee		
	% Time Spent Preparing Students for Exam					
Item	None[a]	1 Day to 2 Months[b]	Over 2 Months[c]	None[d]	1 Day to 2 Months[e]	Over 2 Months[f]
37. Interest in helping my students attain test scores that will allow them to graduate high school	100.0	100.0	94.6	87.5	85.7	97.5
36. Interest in helping my school improve high school graduation exam scores	100.0	100.0	93.2	68.8	78.6	91.4
42. Staff development in which I have participated	100.0	52.6	64.9	71.9	64.3	67.9
41. Interactions with colleagues	91.6	78.9	74.3	65.6	50.0	70.4
35. Format of the exam	80.9	78.9	89.2	31.3	57.1	81.5
33. Personal desire	66.7	78.9	78.4	87.5	92.9	84.0
34. Belief these are the best instructional practices	66.7	63.2	82.4	93.8	89.3	88.9
38. Interest in avoiding sanctions at my school	50.0	47.4	71.6	28.1	35.7	51.9
40. Interactions with school principal(s)	50.0	15.8	54.1	46.9	25.0	39.5
43. Interactions with parents	50.0	15.8	43.2	34.4	32.1	32.1
39. Interest in obtaining a monetary award for my school	33.3	00.0	28.8	18.8	10.7	16.0

Note. [a]n = 12. [b]n = 19. [c]n = 75. [d]n = 32. [e]n = 28. [f]n = 81.

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Table 7 illustrates the impact high school exit examination scores had on teachers' instructional practices. Over 91% of respondents from both states who spent the most time preparing students for the high school exit examination indicated that their interest in helping students attain test scores necessary for high school graduation and an interest in helping their respective schools improve exit examination scores were factors that influenced their instructional practices. In Mississippi, examination scores seemed to be important regardless of the time spent preparing for the examination: 100% of the Mississippi, respondents spending no time and 1 day to 2 months preparing students for the examination said an "interest in helping my students attain test scores that will allow them to graduate high school" and "interest in helping my school improve high school graduation examination scores" were factors influencing their instructional practices.

There were differences among respondents concerning the impact that the level of interest in avoiding sanctions at their respective schools had on their instruction. The most noticeable difference was found among respondents regarding the influence factor "format of the examination." Of Mississippi respondents spending the most time preparing students for the high school exit examination, 89.3% noted that this was a factor; whereas only 31.3% of Tennessee respondents spending no time preparing students for the high school examination felt this was a factor. Additionally, comparing the teachers' beliefs in best instructional practices to the amount of time respondents spent preparing students for the examination yielded interesting results. In Mississippi, only 66.7% of those respondents spending no time and 63.7% of respondents spending 1 day to 2 months preparing students for the examination said their beliefs were a factor influencing their instruction; in Tennessee, 93.8% of those respondents who spent no time preparing students for the examination identified their beliefs as a factor influencing their instruction. Finally, teachers from both states, regardless of time spent preparing for the accountability examination, were in agreement that "interest in obtaining a monetary award for my school" has very little impact on the instructional practices they use.

Discussion

The purpose of this study was to compare the instructional practices used and factors influencing their use by Mississippi and Tennessee science teachers who taught Biology I tested on their respective state's high school exit examination. An analysis of the data resulted in the formation of three themes: (1) types of instructional practices used; (2) relationship between the type of instructional practice used and time spent on test preparation; and (3) the influence of testing on instruction.

Theme 1: Types of Instructional Practices Used

Teachers in both states were more likely to use a balance of student-centered and teacher-centered practices. If the question is which of these approaches was most

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effective, the answer is both. Student-centered methods have been found to be more effective for teaching complex objectives and developing higher level thinking skills. Teacher-centered methods are more effective for teaching arbitrary knowledge (Clark, Kirschner, & Sweller, 2012; Hirsch, 1996; Howe, 2002; Kirschner, Sweller, & Clark, 2006), procedural skills, and organizing knowledge to review facts and identify relationships (Clark et al., 2012; Good & Brophy, 2000; Hirsch, 1996; Kirschner et al., 2006). Effective teachers use both methods, depending upon the needs of their students and objectives of each lesson (Airasian & Walsh, 1997; Pressley, Rankin, & Yokor, 1996; Zemelman, Daniels, & Hyde, 1998). Respondents in the present study reported using a variety of instructional strategies even in a high stakes context, casting doubt to a possible claim that teachers succumb to a "teaching to the test" mentality (Nichols & Berliner, 2007).

Although it is impossible to describe the perfect balance between student-centered and teacher-centered instruction due to factors such as subject, grade level, and lesson objectives (Jones, Jones, & Hargrove, 2003), research on best practices (Daniels & Bizar, 1998; Wenglinsky, 2000; Zemelman et al., 1998), and position papers of professional teaching organizations (e.g., Association for Science Teacher Education, National Association for Research in Science Teaching, National Science Teachers Association) have advocated instructional strategies that engage students as active learners. So while educators recognize that both student-centered and teacher-centered approaches are effective for student learning, student-centered approaches primarily are seen as instruction that allows students to connect new ideas to their previous knowledge and experience, to think critically and creatively, and thereby develop higher-level thinking skills. In contrast, teacher-centered approaches are mostly limited to the development of lower level thinking skills (i.e., identifying, memorizing, practicing and listing information) and procedural knowledge (Clark et al., 2012; Howe, 2002).

According to data in the present survey, teachers from both states used instructional practices and tools. These respondents used a balance of student-centered and teacher-centered instructional practices as advocated by professional teaching organizations (e.g., National Council for the Social Studies). In this light, results indicated high stakes testing did not have as much of a negative impact on pedagogical practices as Goodwin (2014), Mora (2011), and Faxon-Mills et al. (2013) found.

Data also indicated that the results of the high school exit examination were important to both Mississippi and Tennessee Biology I teachers. Over 88.6% of Mississippi teachers and 77.3% of Tennessee teachers reported spending class time preparing students for the high school exit examination; of those, 79.7% of Mississippi teachers and 74.3% of the Tennessee teachers spent over 2 months preparing students for the examination.

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Theme 2: Relationship between Instructional Practice and Test Preparation

Comparisons were made among teachers in both states spending no time, 1 day to 2 months, and over 2 months preparing their students for the high school exit examination. The results of these comparisons lead to the second theme: the relationship between the type of instructional practice used and time spent on test preparation. As Settlage and Meadows (2002) described in their position paper, high school teachers care about the academic welfare of their students just as their colleagues who teach in early childhood and elementary settings, despite unfounded claims that the high school teachers are more interested in teaching content.

As shown by the data, there was a minimal relationship between instructional practices used most often by Mississippi and Tennessee respondents and the amount of time spent on test preparation. Respondents from both states who spent no time preparing students for the exit examination were more likely to use student-centered practices such as lab equipment, audiovisual materials, and creative/critical thinking questions, and the teacher-centered practice of the use of multiple choice questions than teachers who spent time preparing students for the examination. Also, teachers from both states who spent time preparing students for the exit examination were more likely to use student-centered-practices (e.g., cooperative learning, open-response questions) and teacher-centered practices (e.g., textbooks, textbook-based assignments, lecturing) than those who spent no time preparing students for the examination. Presumably, these respondents felt that using a balance of student-centered and teacher-centered instructional approaches was not only the best way to teach, but it was the best way to prepare their students for the high school exit examination.

These results both affirm and call into question previous research concerning the impact of high-stakes testing on teachers' instruction. For example, in Mississippi, teachers spending no time preparing students for the high school exit examination were more likely to use student-centered practices than teachers who are spending time preparing students for the examination. Also, Mississippi teachers spending the most time preparing students for the exit examination were more likely to use teacher-centered practices than teachers spending no time or 1 day to 2 months preparing students for the examination. These results support previous research (see Darling-Hammond & Wise, 1985; Faxon-Mills et al., 2013; Goodwin, 2014; Jones & Whitford, 1997; Madaus, 1988a, 1988b; McNeil, 2000; Nichols & Berliner, 2007; Nichols & Valenznela, 2013; Shepard, 1989).

Other results shown in Table 5 contradict previous research and in some cases, defy logic. For instance, even though the high school exit examination in both states use multiple choice questions almost entirely (see Center on Educational Policy, 2005), respondents in both states who spent the least time preparing students for the exam reported using multiple choice questions. This finding is somewhat misleading. As

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shown in Table 5, the use of multiple choice questions was prevalent with respondents in both states regardless of the time spent preparing students for the exam. This may relate to teacher familiarity with the practice. Respondents were most probably aware of the pressures surrounding exam results. However, they reported being more comfortable using certain instructional practices, and in some cases they rationalized this use in spite of perceived obstacles such as the stakes attached to test outcomes (see Good & Brophy, 2000; Zemelman, Daniels, & Hyde, 1998). Since the exit examination was primarily made up of multiple choice questions, it seems logical that respondents would use this practice in their instruction.

Theme 3: Influence of Testing on Instruction

This leads to the issue of teachers' instructional decisions and the last theme, the influence of testing on instruction. Comparisons among respondents from both states reporting time spent preparing students for the high school exit examination and factors influencing the instructional practices they use yielded interesting results. For each group, with the exception of Tennessee teachers who spent no time or 1 day to 2 months preparing students for the high school exit examination, an "interest in helping my students attain test scores that will allow them to graduate high school" and an "interest in helping my school improve high school graduation examination scores" were the most frequent reasons given for the instructional practices used. It is interesting to note that 100% of Mississippi respondents who spent no time or 1 day to 2 months preparing students for the high school exit examination reported that an "interest in helping my students attain test scores that will allow them to graduate high school" was a factor influencing their instructional practices. This was a greater percentage than Mississippi respondents spending the most time (over 2 months) preparing students for the high school exit examination. Also, 100% of Mississippi respondents spending 1 day and 2 months preparing students for the high school exit examination said an "interest in helping my school improve high school graduation examination scores" was a factor influencing their instructional practices. This was also a greater percentage than Mississippi respondents spending over 2 months preparing students for the high school exit examination. Over 90% of the Tennessee respondents who spent the most time preparing students for the high school exit examination indicated an interest in assisting their students attain test scores that would allow them to graduate and an interest in helping their respective schools improve graduation examination scores as factors that influenced their instructional practices; whereas only 68.8% of respondents who spent no time and 78.6% of respondents who spent 1 day to 2 months indicated an interest in helping their respective high schools improve graduation examination scores as a factor that influenced their instructional practices. Previous test results and the stakes attached may provide an explanation for this finding. Only 70% of Mississippi's test takers earned either a proficient or advanced classification on their state's relatively high-stakes science high school exit examination, while in Tennessee, 95% of test takers earned a proficient or advanced classification on their state's relatively lower-

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stakes science high school exit examination (Mississippi Department of Education, 2006; Tennessee Department of Education, 2006).

Another striking result was the differences found among respondents regarding the influence factor "format of the examination." Whereas 89.3% of Mississippi respondents spending the most time comparing students for the examination reported this as a factor, only 31.3% of Tennessee respondents spending no time preparing students for the examination indicated the same. This disparity is not surprising. For respondents who spent time preparing their students for the high school graduation, the format of the examination was critical for their preparation. For respondents who spent no time preparing their students for the examination, the format of the examination was relatively meaningless. This explanation, though logical, is not supported by data: 80.9% of Mississippi respondents who spent no time preparing students for the examination reported that “format of the examination” was a factor. This could mean that unlike Tennessee respondents who spent no or little time preparing students for the examination, Mississippi respondents were using instructional practices they felt “matched up” well with the format of the exit examination. This may have been due to their students’ past performance on the examination.

Comparing teachers’ beliefs in best instructional practices to the amount of time respondents spent preparing students for the examination also yielded interesting results concerning the powerful influence of testing on instruction. Of Mississippi respondents, only 66.7% who spent no time and 63.7% who spent one day to two months preparing students for the examination reported their beliefs was a factor influencing their instruction. Of the Tennessee respondents, 93.8% who spent no time preparing students for the examination identified their beliefs as a factor influencing their instruction. This finding may suggest frustration felt by Mississippi respondents who spent no time and 1 day to 2 months preparing students for the examination. Even though they reported spending no time or comparatively little time preparing students for the examination, these teachers were still concerned about the examination and all had an “interest in helping my students attain test scores that will allow them to graduate high school” and an “interest in helping my school improve high school graduation examination scores.” Perhaps the desire to have their students and school perform at a high level influenced these respondents to use instructional practices they did not believe were the best. For Tennessee respondents who spent no time preparing students for the examination, the opposite appeared to occur. They had less of an “interest in helping my students attain test scores that will allow them to graduate high school” and an “interest in helping my school improve high school graduation examination scores.” These teachers reported focusing less on test scores and more on using what they thought were the best instructional practices for helping their students to learn. Although this finding supports previous research on negative aspects of high-stakes testing (Darling-Hammond & Wise, 1985; Gilman & Reynolds, 1991; Jones & Whitford, 1997; Madaus, 1988a, 1988b; McNeil, 2000; Shepard, 1989), it is important to consider that over 82% of respondents from both states spent the most time and 89.3%

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of respondents from Tennessee spending 1 day to 2 months preparing students for the exit examination felt that the results were very important and instructional practices that help students to do well on the examination are the best way for them to learn.

Also of note were the factors that did not influence instructional decisions. Teachers from both states agreed that "interest in obtaining a monetary award for my school" had very little impact on instructional practices used. This finding supports previous research on teacher motivation. Johnson (1986) found that professional efficacy is the primary motivator for teachers to comply with state-mandated testing programs. It seems that for both Mississippi and Tennessee respondents, influence factors such as an "interest in helping my students attain test scores that will allow them to graduate high school" and an "interest in helping my school improve high school graduation examination scores" were more of a motivator than an "interest in obtaining a monetary award for my school," which may have been viewed as a luxury rather than a threat.

Limitations of the Study

The use of a survey instrument has limitations. First, a survey such as the one we developed can only measure self-reports of past actions. As Gonyea (2005) warned, self-reported data can be trusted only if the survey instruments and their administration give careful attention to the area of scholarship that they seek to address. Second, the survey instrument only provided teachers with a specific list of instructional practices and influence factors. There may have been other instructional practices that high school teachers used and factors that influenced their use other than those listed in the survey instrument. Third, the survey only asked what instructional practices teachers were using, not how they were using them. Potentially, there might have been a difference in implementation of practices. For example, two teachers reported regularly using role play in their classrooms. One teacher used prepared scripts. This teacher assigned students characters to "play" according to the script. Then, selected students read their parts in front of the class. The other teacher allowed students to work in groups. Within the groups, students decided the characters, situation, and then wrote a script. Later, students role-played their script in front of the class. The first teacher used role play as a teacher-centered practice; whereas the other teacher used it as a student-centered practice.

Another limitation is the way the *time spent* category was designed. There was a large difference in the span between one day and two months. As described in Footnote 2, the preparation time category was collapsed into *no*, *1 day to 2 months*, and *over 2 months* in order to ensure cell numbers sufficient to meet minimum requirements for a chi-square analysis.

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Recommendations for Future Research and Practice

Next, we offer recommendations for future research and practice. While the present study determined that biology teachers surveyed used a balance of student-centered and teacher-centered practices, knowing *how* teachers use the practice is just as important as knowing *what* instructional practices they use. A mixed-methods research study incorporating interviews with a small representative sample of teachers and daily classroom observations of what and how instructional practices are utilized will add to extant knowledge in this area. Also, modification of the survey instrument to include open-ended questions will allow teachers to share various instructional strategies they used without limiting their responses. Teachers' views about testing and the practice of "teaching to the test" have been explored (see Pinder, 2013; Pinder, Blackwell, & Wairia, 2007; Stringfield & Yakimowski-Srebnick, 2005); however, there has been little research conducted on the types of pressures teachers experience within a state accountability system. As state policymakers continue to mandate the use of accountability examinations, it is important to investigate how teachers are coping with the pressures of a testing system over which they have little control.

Consistent with the work of Burns, Percell, and Hertberg (2006), teachers must use instructional practices designed to question, investigate, and develop students' higher-level thinking skills. To this end, we recommend that practitioners develop activities in which students use their existing knowledge to create richer and deeper understanding of the content. Teachers should expose students to both primary and secondary resources that offer challenges at different levels of reading proficiency in cognitive understanding and provide learning situations that require transfer and application of knowledge and skills to solve complex problems. Students should be taught to collect, analyze, and interpret raw data to investigate advanced level questions and problem-solve.

Finally, we offer recommendations to better prepare teacher candidates in science education. Faculty should allow time for and give consideration to high stakes testing issues in science teacher education programs in order to articulate and prepare candidates for the challenges teachers face in this area. They should work alongside and support classroom teachers in order to gain a first-hand perspective in how they plan, implement, and evaluate instructional practices designed to raise student achievement. This collaboration between science teacher educators and classroom practitioners will help teacher candidates have a greater awareness and deeper understanding of the relationship between instructional practices and high-stakes testing as they begin to navigate the culture within which teachers work.

Conclusion

Results of the present study highlight high school biology teachers' use of both student-centered and teacher-centered practices and tools. A minimal relationship was

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doi:10.3776/joci.2014.v8n2p36-67

found between the most used instructional practices and time spent preparing students for the exit examination. The factors most associated with teachers' instructional decision-making were related to their interest in helping students attain high school graduation and helping their school improve exam scores. These findings add to existing research by presenting a detailed picture of instructional practices and factors influencing their use by biology teachers who prepare students for state-mandated examinations.

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http://www.joci.ecu.edu

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

Appendix- The Survey Instrument

Part I

Please circle the number indicating the extent to which you use each of the following:

Use the following scale:

D = Don't Use
R = Rarely (Average less than 1 day per week)
O = Occasionally (Average 1 day per week)
RU = Regularly (Average 2 to 4 days per week)
M = Mostly (Average 4 to 5 days per week)
NA = Not Applicable (not used in your high school academic program)

Instructional Strategies

	D	R	O	RU	M	NA
1.Writing assignments	1	2	3	4	5	6
2. Group projects	1	2	3	4	5	6
3. Textbook based assignments	1	2	3	4	5	6
4. Discussion groups	1	2	3	4	5	6
5. Multiple-choice questions	1	2	3	4	5	6
6. Open-response questions	1	2	3	4	5	6
7. True-false questions	1	2	3	4	5	6
8. Inquiry/Investigation	1	2	3	4	5	6
9. Problem-solving activities	1	2	3	4	5	6
10. Worksheets	1	2	3	4	5	6
11. Lessons based on current events	1	2	3	4	5	6
12. Project-based assignments	1	2	3	4	5	6
13. Creative/critical thinking questions	1	2	3	4	5	6
14. Role playing	1	2	3	4	5	6
15. Use of charts, webs and/or outlines	1	2	3	4	5	6
16. Use of response journals	1	2	3	4	5	6
17. Use of rubrics or scoring guides	1	2	3	4	5	6

Teaching Techniques

	D	R	O	RU	M	NA
18. Interdisciplinary instruction	1	2	3	4	5	6
19. Lecturing	1	2	3	4	5	6
20. Modeling	1	2	3	4	5	6
21. Cooperative learning/ group work	1	2	3	4	5	6

Instructional Materials and Tools

	D	R	O	RU	M	NA
22. Textbooks	1	2	3	4	5	6
23. Supplementary materials	1	2	3	4	5	6
24. Newspaper/ magazines	1	2	3	4	5	6
25. Audiovisual materials	1	2	3	4	5	6
26. Lab Equipment	1	2	3	4	5	6
27. Calculators	1	2	3	4	5	6
28. Computers/ educational software	1	2	3	4	5	6
29. Computers/ internet and/or on-line research service	1	2	3	4	5	6
30. Visual aids (i.e., posters, graphs)	1	2	3	4	5	6

31. Do you prepare students for the high school graduation examination?

___ Yes (Please answer question 32.)

___ No (Please skip questions 32. Go to question 33.)

32. Preparation Time (Amount of instructional time you spend preparing students for the high school graduation exam.)

___No more than 1 day
___2-3 days
___1 week
___2-3 weeks
___1 month
___2-3 months
___4-6 months
___Over 6 months

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

Part II

Please circle the number indicating your responses to the statements below, using the following scale:

SD = Strongly Disagree
D = Disagree
U = Undecided
A = Agree
SA = Strongly Agree

The instructional practices I use have been influenced by the following:

	SD	D	U	A	SA
33. Personal desire	1	2	3	4	5
34. Belief these are the best instructional practices	1	2	3	4	5
35. Format of the high school graduation examination	1	2	3	4	5
36. Interest in helping my school improve high school graduation examination scores	1	2	3	4	5
37. Interest in helping my students attain test scores that will allow them to graduate high school	1	2	3	4	5
38. Interest in avoiding sanctions at my school	1	2	3	4	5
39. Interest in obtaining a monetary award for my school	1	2	3	4	5
40. Interactions with school principal(s)	1	2	3	4	5
41. Interactions with colleagues	1	2	3	4	5
42. Staff development in which I have participated	1	2	3	4	5
43. Interactions with parents	1	2	3	4	5

Part III

Please mark the responses that describe you.

44. ___Male ___Female

45. Teaching Experience

___First year
___2-6 years
___7-9 years
___10-14 years
___15-19 years
___20-24 years
___25-29 years
___30 years or more

46. Education (Highest level attained)

___Bachelor's Degree
___Master's
___Master's +15
___Master's +30
___Master's +45
___Master's +60
___C.A.G.S. or Specialist's
___Doctorate

47. Teaching Assignment (Primary teaching assignment)

___English
___Mathematics
___Science
___Social Studies

48. State (State you teach in)

___Mississippi
___Tennessee

THANK YOU VERY MUCH FOR YOUR TIME

Comments regarding instructional practices you use to prepare students for the high school graduation examination:

Journal of Curriculum and Instruction (JoCI)
December 2014, Vol. 8, No. 2, Pp. 36-67
http://www.joci.ecu.edu

ISSN: 1937-3929
doi:10.3776/joci.2014.v8n2p36-67

About the Authors

Kenneth E. Vogler, EdD, is an associate professor in the Department of Instruction and Teacher Education at the University of South Carolina where he teaches courses in curriculum and instruction, elementary social studies methods and supervises preservice teachers. His research interests include the impact of high-stakes testing on teachers and students, social studies education, and teachers' use of verbal questioning. Email: kvogler@mailbox.sc.edu

G. Nathan Carnes, PhD**,** is an associate professor and program coordinator of Middle Level Education within the Department of Instruction and Teacher Education at the University of South Carolina, where he teaches undergraduate and graduate science methods courses within elementary, middle level, and secondary degree programs. His research focuses on science teacher preparation activities and issues.
Email: ncarnes@mailbox.sc.edu