A Survey of How English Language Arts Teachers Address Synthesis Writing in Classroom Instruction

by

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Abstract

The use of information from source materials in service of an argument or idea original to a writer is, according to the scholarly literature, one of the most complex applications of reading and writing. It is also, according to the literature, a type of composition that is valued in higher education. In an effort to determine how teachers of various English Language Arts (ELA) courses are addressing this important type of writing, the author conducted a nationwide survey, collecting responses from 1,200 ELA teachers. The survey asked respondents to provide a definition of *synthesis writing* and to describe an example of a synthesis task that they would assign to students, and those definitions and task descriptions were categorized and coded. The survey also asked about the frequency with which respondents assign such synthesis-writing tasks, as well as the frequency with which they address key synthesis-writing strategies and with which they apply particular pedagogical strategies. Additionally, the survey asked respondents about their awareness of learning objectives pertaining to synthesis writing in their state course-of-study standards and the extent to which they received training on synthesis writing in college courses, professional development workshops, or in-service activities. Responses to these questions were analyzed against various demographic data provided by the respondents (e.g., type of ELA course taught, type of school, years of teaching experience) in order to determine if responses about synthesis writing correlated strongly with or were dependent on specific demographics.

The survey data suggest that respondents across various types of ELA courses define synthesis writing differently. Furthermore, respondents often perceive synthesis writing differently than their articulated definition of synthesis writing. Additionally, the types of tasks that they identify as synthesis writing often do not align with their own definitions of that term. The data also suggest that ELA teachers in urban schools or those whose students are primarily nonwhite may provide more frequent opportunities for what they perceive as synthesis-writing tasks, but those tasks are less likely to actually involve synthesis of information from multiple source materials. The data also indicate that ELA teachers with 16 or more years of teaching experience are more likely to provide frequent instruction in key synthesis-writing skills.

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I. Relevance of Synthesis Writing in English Language Arts Education

English language arts (ELA) teachers have common expectations and objectives for student writing, such as expressing an opinion, telling a story, or explaining a process. They frequently ask students to write in response to a text or texts, and this writing can involve a range of stances (e.g., summarizing information, analyzing specific statements or assertions, providing an interpretation). As teachers guide their students to engage in progressively more challenging writing activities, the act of synthesizing information from various source materials and using it for a new purpose, original to the student author, is one of the most complex composition strategies that educators expect students to master. Synthesis writing has been described as essential to education generally and academic writing specifically (Flower et al., 1990; Lasch, 1995; Graff, 2003) and is associated with complex cognitive tasks (Braxton & Nordvall, 1985).

Professional education organizations have acknowledged the importance of synthesis writing in college-level academic study (Council of Writing Program Administrators, 2000; Center for Education Policy Research, 2003; Academic Senates for California Community Colleges, 2002[1]). Major educational organizations have addressed the issue of synthesis writing in high school curricula: the *National Council of Teachers of English Standards for the English Language Arts* (2007), the National Board for Professional Teaching Standards (2003), and the

[1] Although a survey of professors of first-year composition reported that synthesis writing is one of the stances most frequently expected of and assigned to students, the survey also indicated that only about one-third of their students were sufficiently prepared to engage in synthesis writing in first-year composition courses. Consequently, professors reported that synthesis writing was the third most common topic for instruction, cited by 63% of professors. The most frequently cited topic for instruction was writing argumentative essays, at 72%, followed by analyzing information or arguments at 69%.

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects (2010) all emphasize the importance of being able to synthesize information in secondary education. If synthesis writing is valued in college-level study, then an important next question is to what extent are high schools preparing their college-bound students to engage in synthesis writing? [2] Understanding the extent to which and the means by which high schools are addressing synthesis writing can have important ramifications for state high school writing curricula, assessment emphases for students, and professional development resources for high school teachers.

Although students in any high school course of study can seek a college degree, some high school courses are specifically designed to prepare students for the types of academic engagement they will encounter in college. Dual enrollment or dual credit (DE/DC) courses offer high school students the opportunity to participate in college courses, which are offered on the campuses of high schools or local colleges (usually a community college or two-year college) campus. In these courses, students can earn both high school and college course credit. Because these courses are based on the curricula of individual higher education institutions or systems, however, significant variability may exist in DE/DC course curricula, degrees of rigor, and means of assessment.

[2] This is not to say that synthesis writing is not important for students who do not intend to attend college. However, the focus of previous studies has been on synthesis as a college-level task, and this study continues that line of inquiry. The argument can be made that all high school students, not just those preparing to attend college, benefit from academically rigorous curricula. The Southern Regional Education Board (SREB) has long advocated the incorporation of high academic standards throughout the high school curriculum, including career and technical education (CTE) programs, not only because their research indicates that doing so contributes to higher graduation rates (SREB, 2011) but also because businesses and industries cite an increasing need for workers with strong academic skills, including writing (SREB, 2011). SREB cites the Carl D. Perkins Career and Technical Education Improvement Act of 2006, which stipulates that states align CTE courses with state academic content standards, including writing standards; the act further stipulates that rigorous academics be linked with programs of study in high-demand career fields.

The International Baccalaureate (IB®) Diploma Program, which is offered to high school students, is "designed as an academically challenging and balanced programme of education with final examinations that prepares students, normally aged 16 to 19, for success at university and life beyond" (IB2011, The IB Diploma Programme). One of the core components of the IB Diploma Program is the completion of an extended essay, described as "an independent, self-directed piece of research, culminating in a 4,000 word paper" (IB, 2011, Diploma Programme curriculum -- core requirements). Furthermore, IB claims that participation in this research process develops various abilities in students, including the capacity to synthesize knowledge (IB, 2011, Diploma Programme curriculum -- core requirements). The IB website does not, however, define their use of the term *synthesize*, so it isn't clear exactly what action is intended by the term.

Advanced Placement (AP®) courses are explicitly developed to present curricula which are equivalent to those found in typical introductory-level college courses *(AP English Course Description*).[3] Four of the 28 AP courses (English Language and Composition, European History, United States History, and World History) explicitly require students to write essays based on information from multiple sources, and the courses address this requirement on their corresponding AP Exams.

The AP European History and United States History courses noted include the following writing requirement: "The course provides students with frequent practice in writing analytical and interpretive essays such as document-based questions (DBQ) and thematic essays" (AP European History: Curricular Requirements, 2010). The *AP European History Course*

[3] The author of this dissertation is a senior director of curriculum and content development for the AP Program.

Description (2007) describes its DBQ in a way that is similar to the descriptions of the DBQs for the AP U.S. History and World History courses):

> The primary purpose of the document-based essay question is not to test students' prior knowledge of subject matter but rather to evaluate their ability to formulate and support an answer from documentary evidence….The document-based question is an exercise in both analysis and synthesis. It requires that students first read and analyze the documents individually and then plan and construct an appropriate response to the essay question based upon their interpretation of the documentary evidence as a whole. (p. 20-21)

The AP World History course curriculum was revised in 2010, and its curricular requirements contain the following two statements related to the use of source materials in student writing:[4]

- The course provides opportunities for students to develop coherent written arguments that have a thesis supported by relevant historical evidence.
- The course provides opportunities for students to analyze evidence about the past from diverse sources, including written documents, maps, images, quantitative data (e.g., charts, graphs, tables), works of art and other types of sources. ("AP World History: Curricular Requirements," 2010)

The AP English Language and Composition course, which is designed to address the typical curricular requirements of introductory rhetoric and composition courses in college, also requires students to write essays based on information from source materials:

> The course teaches research skills, and in particular, the ability to evaluate, use, and cite primary and secondary sources. The course assigns projects such as the researched argument paper, which goes beyond the parameters of a traditional research paper by

[4] At the time of this writing, the AP European History and U.S. History courses were undergoing similar revisions of their course curricula.

> asking students to present an argument of their own that includes the analysis and synthesis of ideas from an array of sources. (AP English Language and Composition: Curricular Requirements, 2010)

While the AP history courses require students to write analytical and interpretive essays based on a variety of sources, the AP English Language and Composition course specifically requires students to utilize information from multiple sources to inform an argument generated by the student. This requirement was added to the AP English Language and Composition curriculum in 2006, after consultation with the Council of Writing Program Administrators ("AP English Language and Composition 2007 Released Exam," 2008).

As the literature review will demonstrate, the term *synthesis writing* can be interpreted in several ways. Colleges and universities, for example, indicate a preference for defining synthesis writing as the organization of information from source materials around a controlling idea that serves as a complex concept or purpose invented by (i.e., originating with) the student writer. It is this application of the term synthesis that is the focus of this study.

The literature review will also show that most of the research to date on this topic has focused on the characteristics and process of effective synthesis writing and that little research has been conducted on how teachers' instruction addresses this important reading and composition strategy. It is important, therefore, to collect data on the ways that teachers of a variety of ELA courses address synthesis writing in their instruction; this includes AP, IB, DE/DC, English Language Learners (ELL), and regular ELA courses. The AP English Language and Composition course requires students to analyze and utilize information from source materials in service of the student writer's own argument (i.e., the student's own rhetorical purpose). This application of the term *synthesis writing* is similar to that valued and expected in

higher education (i.e., the organization of information from sources around a controlling idea to address the writer's own complex concept or purpose). Gathering data about the ways teachers of the AP course reportedly address synthesis writing can serve as a useful baseline of data. Comparing AP teachers' data with information about the ways that other ELA teachers reportedly address synthesis writing may reveal patterns among the ways that different groups of ELA teachers reportedly address this important form of academic writing, especially when they may not be required to teach such writing. This, in turn, may suggest how professional-development resources regarding synthesis writing might be created to meet the needs of specific categories or populations of teachers and allow them to prepare more students for successful experiences with college-level academic writing.

This study was conceived to gather information specific to the teaching of synthesis writing in high school ELA courses (AP, IB, DE/DC, ELL, and regular English courses). The primary research questions for the study were the following:

1. How do English teachers reportedly define synthesis writing in their courses?
2. To what extent do English teachers reportedly provide explicit or direct instruction on the skills involved in synthesis writing?
3. What are the characteristics of instruction on synthesis writing that English teachers report providing? (These characteristics pertain to factors such as task impression, awareness of audience and academic discourse community, selection and use of source materials, application of a rhetorical purpose, and the writing process.)
4. What professional training do teachers report as having had the greatest impact on their instruction on synthesis writing?

5. Are high school ELA teachers of AP, IB, DE/DC, ELL, and regular English courses characterized by different patterns of responses to these questions?

II. Literature Review

The body of literature on synthesis writing, which has accumulated over thirty years, does the following:

- Identifies multiple definitions of synthesis writing.
- Argues for the relevance of a particular type of synthesis writing, interpretation for a rhetorical purpose, in academics.
- Describes contexts that affect synthesis writing (e.g., academic discipline, discourse community).
- Explains processes in which students engage when learning synthesis writing (e.g., forming task impressions, activating prior knowledge, selecting source materials, developing an original argument or interpretation).
- Describes pedagogical strategies that affect synthesis writing (e.g., orienting to *topoi*, guided reading, modeling, scaffolding).

These areas of scholarly focus are illustrated in Figure 1.

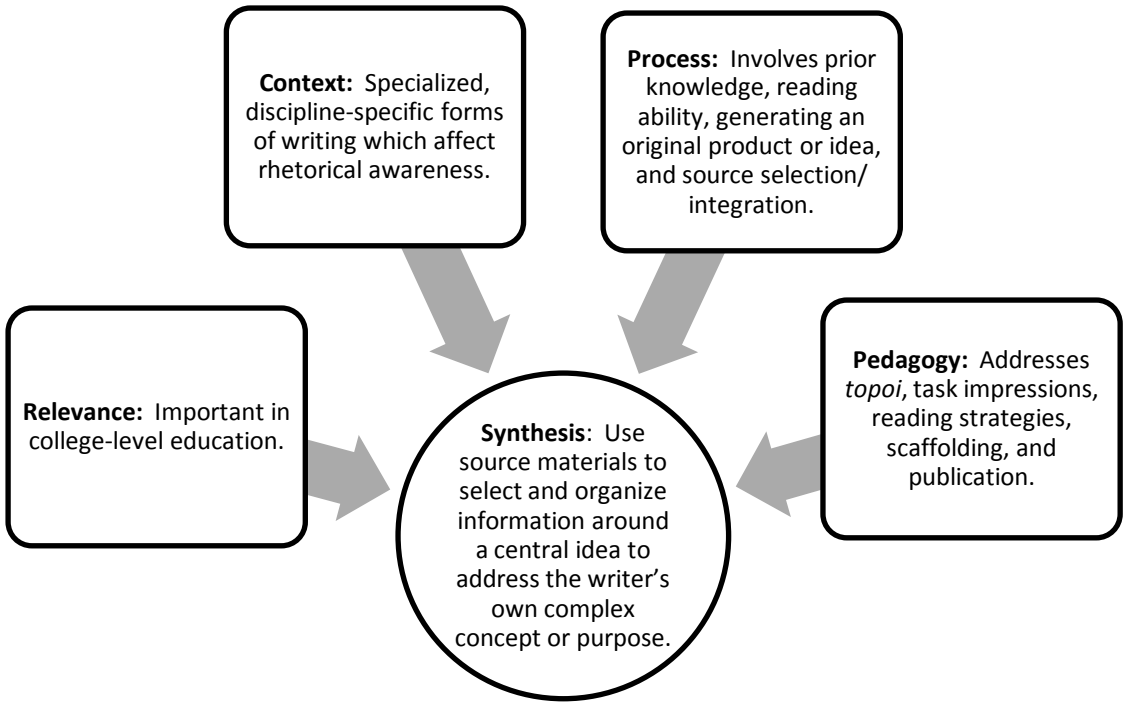

Figure 1. Key Foci of Synthesis Research

I will use these overarching themes to frame my discussion of the literature, during the course of which it will become clear that the existing research on synthesis writing does not adequately describe the ways and extent to which teachers typically address synthesis writing in their courses and instruction.

Defining Synthesis Writing

Before one can begin investigating how teachers provide instruction on the topic of synthesis writing, it is important to determine the type of writing situation intended by that term. The consensus of Kinneavy (1971), Spivey and King (1989), Flower et al. (1990), and Kantz (1990) seems to be that the synthesis writing valued and expected in college involves the

organization of a discussion or composition, based on source materials, around a controlling concept that the writer has constructed (i.e., a concept or purpose invented by or originating with the student writer) by making coherent connections across various source texts. Further, synthesis writing tasks that require the formation of a rhetorical purpose, including sensitivity to audience and context, may generate more knowledge than synthesis writing that does not. Flower et al. (1990) assert that the amount of knowledge transformation that occurs during the act of composing is an accurate measure of the cognitive complexity of a writing task. These researchers offer the following graphic (1990, p. 64) to demonstrate this range of complexity (see Figure 2):

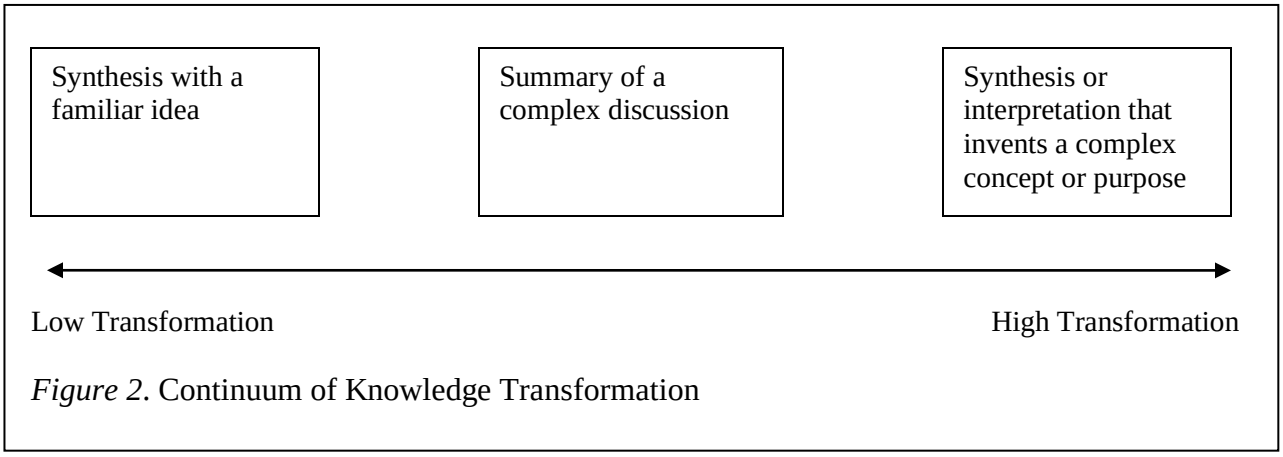

Figure 2. Continuum of Knowledge Transformation

Flower et al. also identified several desirable reading and writing processes that were encouraged by engaging in basic (non-argumentative) synthesis writing (1990, p. 47):

- Reading source texts for gists instead of details.
- Creating an overarching structure for ideas.
- Integrating source information and prior knowledge into a unified concept.

Flower et al. further identified the additional benefits of engaging in synthesis writing that includes a rhetorical purpose (1990, p. 53):

- Facilitating the construction of an argument to address the types of tasks encountered in college courses.
- Approximating adult professional writing.
- Serving as an entry point to critical literacy (i.e., questioning, testing, and/or transforming information from source materials, required for participation in academic discourse communities).
- Facilitating sensitivity to the response of the reader.
- Facilitating the understanding that texts, including the writer's own texts, are subject to "scrutiny and transformation." (1990, p. 53)

The focus of this study is synthesis writing that involves cognitive complexity that generates a new (i.e., original to the student author) concept or purpose from source materials, and which demonstrates rhetorical awareness (i.e., sensitivity to audience and context).

While that may be the definition of synthesis writing that seems to be most valued in higher academic study, the question remains as to whether that same definition is used by high school teachers who are preparing students for higher academic study. A logical place to begin when determining how teachers define synthesis writing is to examine the ELA standards mandated by state departments of education. At the time of this writing, forty-five states plus the District of Columbia, four U.S. territories (Guam, American Samoa Islands, U.S. Virgin Islands, and Northern Mariana Islands), and the Department of Defense schools had adopted the Common Core State Standards (CCSS) for writing and literacy; Puerto Rico and five states (Alaska, Minnesota, Nebraska, Texas, and Virginia) had not yet adopted those standards (Common Core State Standards Initiative: "In the States", 2010).

CCSS uses the term synthesize 10 times in the primary standards document for ELA (*Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects*). In the ELA standards statements themselves, synthesis writing is addressed under the heading "Research to Build and Present Knowledge":[5]

- Grades 11-12:
    - CCSS.ELA-Literacy.W.11-12.7: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
    - CCSS.ELA-Literacy.W.11-12.8: Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
- Grades 9-10:
    - CCSS.ELA-Literacy.W.9-10.7: Same as W.11-12.7 above.
    - CCSS.ELA-Literacy.W.9-10.8: Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate

[5] Since this study focuses on the application of synthesis writing in high schools, only those Common Core State Standards applicable to high school grades are examined here.

> information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

CCSS Writing Standard 7 for the 9-10 and 11-12 grade bands, by including the statement that students should conduct research "to answer a question (including a self-generated question)" (2010, p. 46), seems to indicate that ideas or purposes original to the student writer are expected in CCSS's application of synthesis. Even in this example, however, the intended level of synthetic complexity is unclear. Students are expected to conduct research to answer a self-generated question, which seems to imply a higher degree of cognitive complexity. However, if the question is generated by the student prior to his or her engagement with source texts, then the information synthesized from those sources does not actually inform the student's creation of the research question. In other words, the student has already determined what the focus of the research and writing should be and will then seek information specific to that question, to the possible exclusion of other relevant information. In contrast, by first engaging with the source materials pertaining to a particular topic, analyzing the information available, and then identifying any questions that arise from that information, the student actually integrates synthesis into the formation of the research (Kantz, 1989a).

Additionally, CCSS Writing Standard 8 for the 11-12 grade band includes the statement "assess the strengths and limitations of each source in terms of the task, purpose, and audience" (2010, p. 46), which suggests that students are expected to evaluate information from source materials in light of the student writer's rhetorical purpose for writing. This same emphasis on determining the rhetorical usefulness of information from source materials is not, however, manifested in CCSS Writing Standard 8 for the 9-10 grade band, which merely directs the

student to “assess the usefulness of each source in answering the research question” (2010, p. 46).

The Common Core Reading Standards for Literacy in Science and Technical Subjects for grades 11-12 include the following statement: “Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible” (2010, p. 62). This description seems to fall somewhere in a gray area between summarization and actual invention of a complex concept or rhetorical purpose for writing, depending on the extent to which the "understanding" involves originality. The Common Core Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects for grades 6-12 include statements about writing discipline-specific arguments based on evidence and data, but those statements do not clearly indicate that the arguments should include invention of a complex concept or rhetorical purpose for writing.

The CCSS, therefore, seem to refer to synthesis inconsistently with regard to the definition of the term most applicable to higher academic writing. The fact that the CCSS glossary in Appendix A does not define the terms synthesis or synthesize only adds to the lack of clarity regarding expectations for application of the term (*Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects, Appendix A: Research Supporting Key Elements of the Standards, Glossary of Key Terms*, 2010). Nevertheless, CCSS does take significant steps to formalize expectations regarding the use of source materials in students’ original compositions. Some states and U.S. territories, however, have not yet adopted CCSS for their K-12 public education systems, and those that have adopted CCSS are in various stages of implementing those standards. It is therefore likely that teachers

inconsistently address synthesis in instruction. Because of this, it is worth looking at the ELA instruction standards created by state departments of education, since those are the curricular guidelines teachers followed for instruction prior to the publication of CCSS.

A review of the standards for ELA instruction in grades 9-12 for the fifty states and the District of Columbia (see Appendix A) reveals that 42 states and the District of Columbia have or had at least one ELA standard that addressed the synthesis of information from source materials. ELA standards from eight states (Alabama, Alaska, Idaho, Kentucky, Missouri, Nebraska, Nevada, and South Carolina) did not use the term synthesis or any derivation of it, nor did they describe with other terminology any activities that resemble the synthesis of information from source materials. Furthermore, among the states and the District of Columbia that did address synthesis in their ELA standards, the lack of agreement or consistency in the application or interpretation of synthesis is readily apparent.

Only two states (Connecticut and Delaware) defined synthesis or synthesize in their ELA standards. Thirty-seven states referenced those terms in their ELA standards with no indication of the specific task expected of students, and they made no clear reference to synthesizing source materials to invent a complex concept or purpose. The following standard statement from Hawaii is typical of the references to synthesis in this group: "Synthesize and cite information from multiple sources" (Hawaii Department of Education, 2005, LA 11.4.3, p. 223). Six states (Colorado, Delaware, Oklahoma, Oregon, , Rhode Island, and Washington) included at least one ELA standard statement using language that referenced the use of source materials to invent a complex concept or purpose. Of those six, only Colorado had a standard explicit on this point: "Uses information from sources to express one's own thoughts, ideas, and impressions"

(Colorado Department of Education, 1995). The other five states in this category expressed a spectrum of interpretations of synthesis, including the following:

- **Delaware:** Persuasive writing, 1.3 (Grades 11 and 12): Use information from sources when appropriate; combine information from text with prior knowledge to elaborate ideas.
- **Oklahoma:** Language Arts, Grades 10, Standard 4.2.3, p. 95: Synthesize information from multiple sources to draw conclusions that go beyond those found in any of the individual studies.

Delaware had the most references to synthesis or synthesizing information from sources, with 22 such statements (see Appendix A, Table A2); eight states, as mentioned above, had no references to synthesis or synthesizing. Across all state standards, synthesis was referenced at each grade level about twice as often in standards statements regarding reading than in those that address writing (see Table 1 and Appendix A, Table A2); when a synthesis standard did not explicitly apply to a particular grade level, it was assumed to apply to all high school grade levels.

Table 1

Frequency of synthesis references in state ELA standards, by grade level and task

Grade	Reading	Writing	Research	Other	Total
9th	36	14	9	3	62
10th	39	19	11	4	73
11th	35	19	13	10	77
12th	33	23	17	9	82
Total	143	75	50	26	

States' definitions of synthesis in these standards documents were inconsistent at best, although these data suggest that curricular requirements or expectations regarding synthesis increased with each grade level. Furthermore, while requirements for synthesis as applied to reading remained

fairly consistent across grade levels, the application of synthesis to other tasks (writing, research, or other) increased with advanced grade levels. The twelfth-grade level had 23 synthesis references related to writing and 17 references related to research, which were more in those categories that at other grade levels. This review also identified 26 ELA standards references to synthesis in contexts other than reading, writing, or research. The following are examples of such standards:

- **Delaware**: Oral communication, Standard 1.4, Grades 9-12: Synthesize and present results of research projects (accurately summarize main ideas). (Delaware Department of Education, 2010, English Language Arts Grade Level Expectations: Written and Oral Communication).
- **New Mexico**: Benchmark III-F, Grade 12, #2: Clarify, elaborate, and synthesize the explicit and implicit meanings of messages (New Mexico Public Education Department, 2009).

Among these examples, one can find a range of applications of synthesis. The New Mexico example describes a task more akin to summarization than synthesis because it includes no statement about generation of new ideas or products. The example from Delaware is a more vague statement about synthesis and presentation of research projects and indicates that the students' synthesis may be summary of main ideas from findings of others (i.e., "My research revealed *x*"). Only if the student takes those research findings and applies them to invent a complex concept or rhetorical purpose for writing (i.e., "My research revealed *x*, which leads me to conclude *y*") will the task actually involve a higher level of cognitive complexity.

Given this inconsistency in application of the term synthesis in standards for secondary-level ELA instruction, it is reasonable to assume that high school English teachers do not

uniformly define the term. A study focusing on the ways that ELA teachers define this term in the context of their classroom instruction can shed light on the degree of cognitive complexity that may be occurring in their synthesis assignments. This investigation, in turn, can provide data that allows educational organizations and policy makers to clarify their intentions regarding synthesis tasks and inform professional development and instructional resources for teachers to potentially change high school writing tasks so they may better prepare students for the academic writing that will be expected of them in college.

Disciplinarity and Task Orientation as Context for Synthesis Writing

Integrating information from sources with one's own knowledge and interpreting one's reading and adapting one's writing for a specific purpose are the core components of academic discourse (Flower, 1989; Greene, 1991; Common Core State Standards for English Language Arts, 2010). Conversely, limited fluency with these components, which are also core components of cognitively complex synthesis, can limit one's active participation in an academic discourse community. The context in which synthesis writing occurs can have a significant impact on a student's successful engagement with that strategy, and one important dimension of the context of writing in secondary and college-level courses is the academic discipline in which the writing occurs (Prior, 2006).

In a study of graduate students at Carnegie Mellon and Pittsburgh Universities, Ackerman (1990) examined writings from sources on topics in or out of their chosen fields of study and found that a writer's rhetorical awareness (i.e., the writer's decisions about the structure, content, and context of the writing) is sensitive to academic discipline as well as the

writing topic selected.[6] McCarthy (1987) conducted a three-year case study of one Loyola College student's writing experiences and found that the context or academic discipline in which synthesis writing occurs can convey varying task impressions for a student (i.e., different academic disciplines suggested, in the student's mind, different types of tasks). Understanding the academic subject area or disciplinary domain in which synthesis writing is embedded, therefore, may help ensure that students accurately perceive the assigned writing task as well as help them make better rhetorical decisions about the writing task.

Knowledge of or familiarity with the academic discipline is not, however, the only significant factor in successful task orientation for synthesis writing. In their study of heterogeneous groups of fourth- and fifth-grade students at an urban neighborhood school, Raphael and Boyd (1991) cited appropriate overlap of the instructor's and the student's task impressions for synthesis as key to mastering that composition strategy, suggesting that explicit instruction in "the specific features of synthesis (e.g., balance of information, elaborated with relevant details from text or knowledge base)" could help better align the student's and instructor's task impressions (p. 38).

A series of studies conducted at Carnegie Mellon University support the importance of forming accurate task impressions when writing. Ackerman (1989a) and Nelson (1990) found that freshmen and their instructors frequently disagreed on the type of writing that was required and actually produced in a given assignment. Ackerman (1989b) also found that students faced with unfamiliar tasks like synthesis writing revert to types of writing with which they are familiar. Ackerman noted that once this occurs it is difficult for students to effectively switch to the type of writing indicated in the task. Flower et al. (1990), in a study of the writing processes

[6] However, in this study the term *academic discipline* was more suggestive of the degree of prior knowledge about a topic, so the findings may be more indicative of general differences in rhetorical preferences and composing strategies among academic subject areas.

of 72 freshmen at Carnegie Mellon University, identified five distinct (but nonhierarchical) forms of writing that students typically engaged in when instructed to compose an original text based on source materials:[7]

- **Summary**: identifies key words in paragraphs, summarizes paragraphs, and constructs a composition around the sets of summaries ("gist and list") but doesn't allow for the introduction of original ideas (Flower et al., p. 44); what Spivey (1990) refers to as "isomorphic summary," because it replicates the structure of the source text(s) (p. 265)
- **Response to the topic**: uses source texts to launch one's own ideas or respond to the topic in general ("skim and respond") but uses the ideas of the source texts superficially (Flower et al., p. 45)
- **Review and comment**: adds one's own comments to a summary or commentary on source texts but doesn't integrate ideas (Flower et al., p. 46)
- **Synthesis**: generates a new product or idea from various source materials (Flower et al., p. 47)
- **Interpretation for a rhetorical purpose**: uses source materials to select and organize information to address a specific audience and the writer's specific rhetorical goals (Flower et al., p. 47).

Note that these categories do not necessarily describe the writing outcomes intended by the instructors; rather, they describe the types of products that students generated. This indicates significant degrees of latitude in the ways that students applied the term *synthesize* when they are given a generic or vaguely defined task of creating original writing based on information from source materials.

[7] Kantz (1990) also acknowledged these same five types of writing based on source materials.

In her study of essays written by 69 college freshmen in an introductory composition course, Kantz (1990) found that confusion about task impressions affected teachers as well as students. After students were instructed to engage in synthesis writing, their teachers frequently disagreed among themselves and even within their own readings (from one essay to another) of how to characterize students' essays. The greatest disagreement came when the teacher-readers attempted to discern between writing characterized as *review and comment* (i.e., distilling information from source texts and commenting on them) and synthesis writing (i.e., using information from sources to invent a product or idea). The teacher-readers indicated that they had difficulty determining whether students were engaging in independent thought (transforming knowledge) or reproducing sources (telling knowledge).

The accuracy of a student's task impression may affect not only how he or she engages with the writing task itself, but it also can affect the student's selection and use of source materials. In a study of the writings of 15 undergraduate students who were given the task of writing either a report or a problem-based essay, Greene (1991) noted that the type of writing task directly affected not only the information that students selected and used when writing from sources but also the way that they constructed meaning from that information (p. 6).[8] Those students who were assigned an informational report interpreted the task as relying on source materials to write the report, which was structured as a collection of information (see Figure 3). Those who were assigned a problem-based argument essay interpreted the task as integrating prior knowledge with information from source materials, and the essays were structured in a problem-solution response pattern (see Figure 4).

[8] See also Kantz, 1989b.

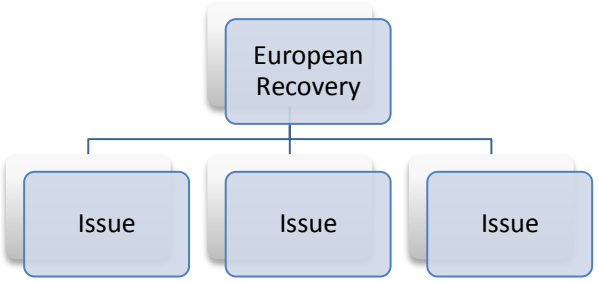

Figure 3. Information collection structure (Greene 1991, p. 20)

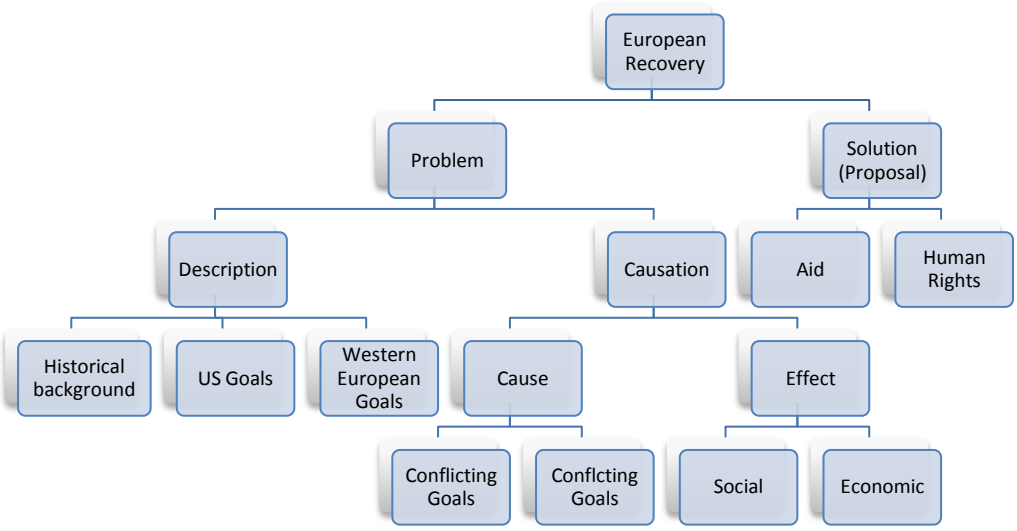

Figure 4. Problem-solution structure (Greene 1991, p. 20)

To summarize, it seems that successful synthesis writing in an academic setting is informed by the following:

- Knowledge of the academic subject area or domain in which the writing occurs
- Understanding of the instructor's intentions regarding the writing task (e.g., review and comment or create an original argument)
- The type of writing task (e.g., informational report or argumentative essay)

It seems important, then, to determine not only the definition or definitions that high school ELA teachers apply to synthesis writing but also whether teachers provide explicit instruction regarding the factors listed above.

The Process of Synthesis Writing

The existing literature on synthesis writing offers descriptions of subprocesses and characteristics of successful engagement in the synthesis-writing task. Relevant to the management of information from source texts and the invention of a complex concept or rhetorical purpose for writing are reading ability, or the level of textual complexity at which one can read fluently (Spivey and King, 1989) and discourse synthesis, or the ability to construct meaning from texts as a reader in order to then construct meaning in a new text one is creating (Raphael and Boyd, 1991). Development of reading ability and discourse synthesis skills begins in the early grades; the acquisition and development of synthesis skills can be adversely affected by limited reading ability and lack of familiarity with necessary discourse skills such as identifying relevant information, integrating information with background knowledge, and using appropriate text structures.

In addition to literacy skill and understanding the context for and nature of the writing task, the ability to select and use source materials in synthesis writing is a critical factor in the process. As noted previously, Greene (1991) identified the role of task impression in students' selection and use of source materials. Kennedy (1985) and Nelson (1992), who studied the composing processes of college students engaged in source-based writing, found that such writing was significantly affected by extensive note taking from the source materials and processing, as well as the level of detail in planning the writing. In her studies conducted at

Carnegie Mellon University, Kantz (1989a) examined the ways that source materials are used during synthesis writing. She found that synthesis writing requires a reading strategy different from that employed by writers who use a "summarize-the-main-ideas approach" (p. 17). While the latter may be able to plan the writing before actually reading the sources, the former requires the writer to gather information from the sources in order to formulate a topic and plan for writing. Spivey (1990), in her article on the constructive processes involved in reading and writing, asserted that writers use four general criteria for selecting information from source texts:

- Relevance (i.e., importance) of the information in the source text; often used when creating gists through summarization.
- Hierarchical placement of content, often used when creating isomorphic (i.e., structurally similar) summaries of texts.
- Intertextual relevance (between sources) often used when compiling general information about a topic from multiple sources.
- Relevance to the new content that the writer is creating, where relevance is determined by the relation of the information from source texts to the writer's rhetorical purposes (p. 274-275).

It is the last criterion that may be most important when writing cognitively complex syntheses, where the writer is creating a complex concept or rhetorical purpose for writing.

In a study of undergraduate students who were instructed to create syntheses in response to a problem-based task (1989b), Kantz drew the following conclusions:

- Successful writers selected source material to use in their syntheses based on the context of the task, instead of merely reproducing text (p. 13).

- Decisions about what to do with source material (e.g., create an original argument, explain the material, summarize the material) had a greater impact on the quality of the synthesis than did decisions about organization of the writing, such as the format of the essay (p. 14).
- The more successful synthesis writers divided the task into manageable components (p. 14).

Kantz described this decision-making process in the following flow chart (see Figure 5).

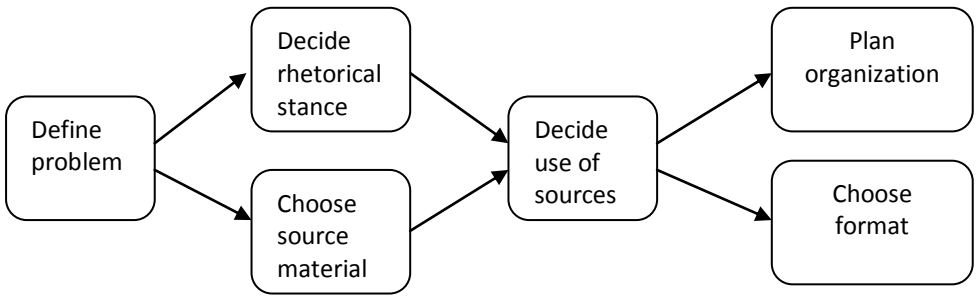

Figure 5. Decisions made during synthesizing, during and after reading source materials, Kantz, 1989b, p. 14

While this process does not specifically emphasize the use of source materials to generate a new product or idea or address the writer's particular rhetorical goals, Kantz (1989b) noted that the writers who produced "the most successful essays defined the writing problem as requiring original thought about the topic and sources" and "set rhetorical goals that required interpretation (not reproduction) of sources" (p. 16).

Raphael and Boyd (1991) studied the abilities of fourth- and fifth-grade students to synthesize information from multiple source materials; they also studied the way that source

texts are used in synthesis writing and analyzed written texts for evidence of different patterns or approaches to synthesis. Raphael and Boyd (1991) identified the following four criteria that seemed relevant to successful syntheses (p. 13-14):

a. **Balance of information**: the selection and use of information collected across source texts, and the proportion of information from source texts as compared with the student's own background knowledge
b. **Degree of integration**: establishing relationships in the information of various source texts (e.g., may be signaled by key words/phrases such as *both*, *alike*, *different from*)
c. **Degree of categorical elaboration**: the extent to which ideas included are elaborated to explain categories of information
d. **Audience sensitivity**: utilizing structure (text organization) and stance (i.e., position as writer in relation to the reader and source materials) congruent with the disciplinary domain

Conversely, Raphael and Boyd (1991) also identified four strategies which, when employed by those young writers, seemed to inhibit successful synthesis (p. 14-15):

- **Associative memory/recall**: association of ideas without overall organization
- **Audience insensitivity**: the question apparently being addressed is not readily identifiable
- **Digression**: Students digress from writing a report to writing a narrative or including inappropriate background knowledge
- **Copying**: Students may (a) copy random text; (b) copy strategic sentences; or (c) paraphrase text sentence by sentence

Summary of findings.

The literature seems to indicate that factors such as the following are important to successful synthesis writing:

- Reading-ability level
- Selection of relevant source materials
- Integration of and elaboration on source materials
- Audience awareness
- Invention of an argument original to the author (i.e., inventing a complex concept or purpose for writing)
- Note taking and planning the composition
- Management of the writing task

Determining the extent to which teachers are addressing and providing instruction on these components of the synthesis-writing process could impact the focus of instructional resources and teacher professional development.

Technology and Synthesis Writing

The growing role of technology in student composition has an impact on synthesis writing. Standard 7 (Integrated Instruction) of the *Adolescence and Young Adulthood English Language Arts Standards* (National Board for Professional Teaching Standards, 2003) emphasizes the importance of technology in facilitating argumentative writing. In 1993, Palumbo noted a connection between synthesis writing and, at that time, the growing emphasis on and utilization of computer-based research and writing and hypermedia for the *creation* of meaning as opposed to the mere discovery of meaning. This view of synthesis writing consequently

demands an increased emphasis on higher-order cognitive development, which in turn could be facilitated by the use of computer-based technologies, because "[b]oth synthesis writing environments and hypermedia environments support the cognitive demands of knowledge construction" (Palumbo, 1993, p. 61). This supports the assertion by Flower et al. (1990) that the transformation of knowledge from source materials for the creation of a new concept or rhetorical purpose for writing is more cognitively complex than other forms of source-based writing. Palumbo's observation was made over a decade ago, and computer and Internet technology has become even more ubiquitous in education since then. Therefore, knowing the extent to which technology is employed in synthesis instruction and writing can inform the focus of future instructional materials and professional development.

Instruction on Synthesis Writing

Instruction seems likely to be a key component of successful student engagement with synthesis writing, so the quality or effectiveness of that instruction is an important factor in the acquisition of this writing strategy. Raphael and Boyd (1991), in their analysis of the composition patterns of 38 fourth- and fifth-grade students, examined the means by which learners engaged in synthesis writing. The first phase involves modeling by the teacher of the strategies related to discourse synthesis (e.g., selection, integration, and elaboration of information) and appropriation of those strategies by the learner (Raphael & Boyd). The second phase involves the learner's internal application of synthesis strategies to her specific uses or goals. The third phase involves publication of the synthesis product, and the fourth phase involves adoption of the synthesis strategies as conventions of the synthesis process.

Kennedy's study (1985) found a lack of congruence between the ways that academic writing is presented through college-level instructional resources and the ways in which students actually engage in that process. Kennedy noted that academic writing textbooks at that time typically presented a linear model of the academic writing process (i.e., read, re-read, take notes, outline, write, revise). Students in this study, however, typically did not engage in that process in a linear fashion. Instead, students tended to engage in the process stages as needed, both before and during writing, in a more recursive manner. Kennedy's findings suggest that it may be important, then, to determine whether teachers present the writing process as linear or non-linear. Knowing this and how this design feature occurs in conjunction with other factors affecting synthesis writing can inform the design of more effective professional development opportunities focused on synthesis writing.

Kantz (1989a) describes two primary challenges to synthesis writing as (1) requiring the writer to engage in a familiar subtask (e.g., reading source materials) but at a higher level of difficulty (e.g., using longer or more textually difficult sources, using more sources, considering the rhetorical contexts of sources) and (2) requiring the writer to engage in new subtasks (e.g., developing one's notes into an original argument). She notes that many students may not have developed the task management skills necessary to successfully address these issues when first attempting synthesis writing. It may also be important, therefore, to determine whether high school ELA teachers are addressing task management of the composing process.

The issue of the student writer's participation in the academic discourse community, discussed previously in the Context section of the literature review, has pedagogical implications. Wilder and Wolfe (2009) studied the effects of explicit instruction in disciplinary discourse conventions on the writing of college students. They found that students who received

explicit instruction in the specific *topoi* [9] of a discipline wrote higher scoring essays than did students who were just aware of the topoi. It may be important, then, to determine not only the extent to which teachers present synthesis writing as a critical component of academic discourse communities but also the extent to which they address the writing conventions and forms of those communities. Wilder and Wolfe indicated that it is important for students to be aware of the discourse conventions of academic communities and that problem-oriented synthesis writing is an important component of those communities. Therefore, knowing the extent to which teachers understand and address synthesis writing and other conventions of those academic discourse communities can have significant implications for the development of instructional resources and professional development opportunities on the subject of synthesis writing.

Other studies (Nelson, 1992; Greene, 1991, Flower, 1995) found that students should be provided opportunities to present drafts of their writing or engage in oral discussion about writing before completing the final draft, in order to allow students time to refine their thinking about a topic, and teachers need to provide explicit instruction regarding the goals for writing assignments. These studies suggest that teachers should address the following:

- Design research and composition tasks that encourage student self-reflection on their work.
- Create a classroom environment that encourages safe and constructive commentary (from the teacher as well as from student peers) on student work.
- Ensure that students are interpreting the synthesis task accurately.

[9] *Topoi*: common warrants, often unstated premises which seek to connect with an audience's hierarchy of values; inventional tools for students. For example, some special *topoi* of literary analysis are (a) *ubiquity*, or pointing out a form that is repeated throughout a text; (b) *paradox*, or pointing out "the unification of apparently irreconcilable opposites;" and (c) *context*, or assuming that "historical and textual detail should be brought to bear on textual interpretation" (Wilder & Wolfe, 2009, p. 175).

- Structure synthesis assignments so that students have ample time to share and discuss drafts of their writing well before final versions are due.

Effective pedagogy is clearly an important factor in successful student engagement in synthesis writing, and data about how teachers are addressing the cognitive complexity of such synthesis writing in their instruction can help inform the development of appropriate instructional resources and professional development opportunities.

Conclusions from the Literature Review

The existing literature identifies several factors involved with students' successful engagement in synthesis writing, particularly the more cognitively complex form involving invention of a concept or rhetorical purpose for writing. Such factors include the following:

- Orientation to the appropriate academic discourse community (i.e., understanding the language of that community)
- Accurate understanding of the specific writing task (i.e., the type of writing intended)
- Accurate understanding of the writing context (i.e., the rhetorical situation of the writing)
- Understanding of organizational structures for argumentative and expository writing
- Modeling of synthesis writing by the teacher or knowledgeable other
- Appropriate instructional support during synthesis writing (i.e., scaffolding, teaching task management skills)
- Rhetorical reading of source materials
- Integration of source materials with each other and with the student's prior knowledge
- Opportunities for student self-reflection on writing in progress
- Opportunities for student discussion about writing in progress

The literature review, including empirical studies, suggests that teachers' conceptual understanding of these factors and how they are addressed in instruction can have a significant impact on successful student engagement with synthesis writing. While the body of literature on synthesis writing provides a significant baseline of information on the task of synthesis writing (as evidenced by the preceding list of factors), a significant gap in information exists, however, on the subject of how teachers actually understand and provide instruction on synthesis writing. Data on the ways that high school teachers across the United States conceptualize the synthesis task and report that they integrate synthesis writing into composition curricula are needed in order to determine whether new teacher resources targeting this topic are required. Additionally, comparisons among categories of English teachers based on the type of ELA course they teach (AP, IB, DE/DC, ELL, and regular ELA courses) and demographic factors (e.g., state in which they teach, type of school, years of teaching experience) may indicate how and where high school teachers have designed promising methods for teaching synthesis writing.

III. Methodology

The survey used for data collection in this dissertation was developed to address the following issues specifically relevant to synthesis writing as identified in the literature review of this proposal:

- Teacher definitions of synthesis writing
- Professional development events that have addressed the use of source materials to invent a complex concept or rhetorical purpose
- The effectiveness of such professional development events
- Awareness of state-mandated curricular requirements that address the use of source materials to invent a complex concept or rhetorical purpose
- Confirmation of task impressions about synthesis writing (including contextual awareness)
- Explicit instruction on
    - Rhetorical conventions of the academic discourse community
    - Evaluation of source materials
    - Integration of information from source materials with prior knowledge
    - Types of writing tasks
    - Metacognitive strategies
    - Creating a complex concept or rhetorical purpose for writing
- Providing teacher and peer feedback to student synthesis writing

Table 2 provides a blueprint for the organization of the survey (see Appendix B) around my research questions.

Table 2

Research questions and survey construction

Research Question	Definition of construct	Survey items
1. How do English teachers reportedly define synthesis writing in their courses?	Synthesis writing addresses the use of source materials to inform an original product or idea. Teachers apply various definitions to this term and/or have various expectations for student work products resulting from engagement in this task.	3, 4, 5
2. To what extent do English teachers reportedly provide explicit or direct instruction on the skills involved in synthesis writing?	The skills involved in synthesis writing include • familiarity with the relevant academic discourse community • understanding the context for writing • understanding the writing task • considering the audience for the writing • understanding the organizational structure for the writing • selecting appropriate source materials • reading source materials rhetorically • integrating information from source materials	6,7
3. What are the characteristics of instruction on synthesis writing that English teachers report providing?	These characteristics of instruction on synthesis writing include • ensuring student understanding of the writing task • modeling synthesis writing • scaffolding instruction • providing feedback to students regarding their writing • providing opportunities for collaborative learning and peer feedback	6, 8, 9, 10
4. What professional training do teachers report as having had the greatest impact on their instruction on synthesis writing?	Professional training is regarded as any professional development experiences, either within or outside the local school setting, that teachers have participated in after obtaining their teaching certification. Impact refers to the extent to which the professional training affected the development of or a change in a teacher's pedagogy regarding synthesis writing.	11, 12, 13, 14, 15

Research Question	Definition of construct	Survey items
5. Are different groups of high school ELA teachers (AP, IB, DE/DC, ELL, and regular English courses) characterized by different patterns of responses to these questions?	The question seeks to determine whether teachers of similar types of ELA courses provide similar • responses regarding preparation for teaching synthesis writing • definitions of *synthesis* • characteristics of instruction on synthesis writing • frequency of instruction on synthesis writing	1, 2, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25

Sampling

Since my goal was to gather information about synthesis writing and instruction from a large and geographically broad population sample, I used the Qualtrics website to conduct an online survey. An invitation to participate in the survey was sent to all ELA teachers at schools with at least one authorized AP English Language and Composition course (since that course requires the type of synthesis writing which is the focus of this survey). In 2007, the College Board initiated the AP Course Audit, a process for AP teachers to verify that they are aware of the curricular requirements for their AP courses; by doing so, the courses could be authorized by the College Board as official AP courses. The list of authorized AP courses is then made publicly available (see https://apcourseaudit.epiconline.org/ledger/). The AP Course Audit is conducted annually, and authorized AP courses must be re-authorized each year.

A review of AP Course Audit data for the 2011-2012 academic year indicates that 12,609 AP English Language and Composition courses had at that time been authorized in the United States. A sample size calculator (www.surveysystem.com/sscalc.htm), with a confidence-level setting of 95% and a confidence interval of 5, indicates that for the total population of AP English Language and Composition instructors, a sample size of 373 would be adequate. Studies of response rates for online surveys (Kaplowitz, Hadlock, Levine, 2004; Hamilton, 2009)

reported median response rates of 20-26%; accordingly, I needed to send 1,500 to 1,800 survey invitations in order to obtain the desired sample size for AP teachers.

Data from the National Center for Education Statistics (http://nces.ed.gov/programs/digest/d11/tables/dt11_075.asp) indicate that, during the 2007-2008 academic year (the most recent period in which such data are available), there were 172,200 English language arts teachers in U.S. public high schools. A sample size calculator (www.surveysystem.com/sscalc.htm), with a confidence-level setting of 95% and a confidence interval of 5, indicates that, for the total population of English language arts teachers in public high schools, a sample size of 383 would be adequate.

Administering the survey electronically to these representative populations allowed me to gather data from a broad demographic cross-section of English teachers (i.e., reflecting diversity in geography, school type, school size, years of teaching experience, and range of professional development) to determine if significant differences regarding synthesis writing exist between groups based on those demographic characteristics. By sending the survey to all ELA teachers at each school, comparisons of AP and non-AP teachers were more valid because many of the survey participants will have student populations with the same demographics.

A 2005 study by Waits, Setzer, and Lewis, which examined nationwide school data for the 2002-2003 school year, found that approximately 11,700 high schools offered DE/DC courses. Forty-nine percent of these courses were offered by schools that also offered AP courses. No data that are more current are available from the U.S. Department of Education or from the National Alliance of Concurrent Enrollment Partnerships (which certifies DE/DC programs). A sample size calculator (www.surveysystem.com/sscalc.htm), with a confidence-level setting of 95% and a confidence interval of 5, indicates that, for the total population of

DE/DC English language arts teachers in public high schools, a sample size of 372 would be adequate. Assuming that the 49% figure referenced above is still reasonably accurate, I expected that my strategy of surveying all ELA teachers at schools that have at least one authorized AP English Language and Composition course would yield an adequate sample size of DE/DC ELA teachers.

The International Baccalaureate (IB) website indicates that 787 schools in the United States offer the IB Diploma Program (http://ibo.org/school/search/index.cfm?programmes =DIPLOMA&country=US&region=&find_schools=Find) . A sample size calculator (www.surveysystem.com/sscalc.htm), with a confidence-level setting of 95% and a confidence interval of 5, indicates that, for the total population of IB English language arts teachers in public high schools, a sample size of 258 would be adequate (assuming one IB English teacher per IB diploma program).

Cumulatively (and assuming no categorical overlap), I would need the following numbers of responses for my survey to be statistically representative:

Table 3

Required survey-response rates

Teacher category	Number of respondents required
AP English Language and Composition	373
IB English	258
DE/DC English	372
Other English	383
Total	1,386

The survey initially targeted ELA teachers at schools in the following states, based on their pre-Common Core ELA standards:

- The two states that explicitly defined synthesis in their pre-Common Core ELA standards: Connecticut and Delaware
- The six states that included at least one statement in their pre-Common Core ELA standards that referenced the use of source materials to invent a complex concept or purpose: Colorado, Delaware, Oklahoma, Oregon, Rhode Island, Washington
- The eight states that did not reference in their pre-Common Core ELA standards synthesis or the use of source materials: Alabama, Alaska, Idaho, Kentucky, Missouri, Nebraska, Nevada, South Carolina

I used the AP Course Audit Ledger to identify in these 15 states all schools with at least one authorized AP English Language and Composition course. Most but not all of the schools in those statewide lists provided links to their school websites; for each listed school that provided a Web link, I searched their school websites for the lists and e-mail addresses of English teachers. By taking this approach, I could ensure that the school and student demographics for the AP English Language and Composition teachers would be the same for the non-AP teachers, since I would be sending the survey invitation to all English teachers at a given school. Initial efforts to compile a mailing list for the survey revealed some limitations to the approach described above:

- For the sake of expediency, I did not attempt to find school websites for those schools in the AP Course Audit ledger that did not provide Web links.
- Many of the provided Web links were not functional.
- Many schools that provided a link to their website did not provide public access to faculty rosters.
- Some schools that do provide access to faculty rosters on their websites did not provide access to teachers' e-mail addresses.

- Some schools that provide access to teachers' e-mail only allow the user to send a message to a teacher via a comment box; the teachers' individual e-mail addresses are not displayed, so it isn't possible to obtain their e-mail addresses for the purpose of sending the survey invitation via mass e-mailing, which was necessary for a high-volume survey such as this.

After sending the survey invitation to the teachers for whom I could collect e-mail addresses in the 15 aforementioned states, I then conducted searches of those states via the ledger of IB diploma programs. Some schools listed in the IB ledger were also listed in the AP ledger. Since those schools had already been addressed in the previous search, I could focus on searching the websites of other schools in the IB lists. The same difficulties with locating teachers' e-mail addresses, as described previously with regard to schools listed in the AP ledger, also applied to the schools listed in the IB ledger.

I then conducted searches of other states via the AP Course Audit ledger, using the same approach described previously. For each of these additional states, I also conducted a search of the IB ledger. In total, I sent the survey invitation to 15,858 separate e-mail addresses[10] in 41 states and the District of Columbia.[11] Approximately one week after the initial e-mail message, I sent a follow-up e-mail reminder about the survey; approximately one week after the reminder message, I sent a third and final e-mail reminder (Dillman, 2000). The survey was available for 46 days.

[10] This number does not include e-mail addresses that were identified as undeliverable or e-mail addresses for teachers who responded that they no longer teach an English course or that they did not wish to participate in the survey.

[11] Technical issues with mailing limits in the Qualtrics website and with sending mass e-mail via Auburn University e-mail system, as well as time constraints, prevented me from sending the survey invitation to teachers in the nine remaining states. Additionally, these issues precluded me from sending larger numbers of invitations to several other states.

Despite sending the survey invitation to 15,858 individual teachers during that timeframe, only 1,217 teachers began the survey, and only 851 completed the entire survey, yielding a response rate of 7.7%. Anecdotal evidence suggests some possible factors in this low response rate:

- E-mail spam filters used by school-level or district-level computer networks may have blocked many of the survey invitations, precluding teachers from participating in the survey.
- After I had sent about half of the total initial invitations, I received some e-mail responses asking if non-AP teachers should complete the survey.[12] I looked at the language of the survey invitation again. The heading of the message (not the subject line of the e-mail) read "Information regarding a Research Study entitled 'A survey of how AP and non-AP English teachers address synthesis writing in classroom instruction'." Some teachers, therefore, may have declined to participate because they interpreted the survey message as not being relevant to their teaching role. To clarify the intent of the survey further, I changed the heading to "Information regarding a Research Study entitled 'A survey of how English teachers address synthesis writing in classroom instruction'." Following that change, I received no further messages about which English teachers are invited to participate; however, some teachers who thought that the initial survey invitation did not apply to them may have disregarded the two follow-up invitations that I sent and therefore were not aware of the clarification in the language of the invitation.

[12] Some respondents, either in e-mail messages to me or in the open-response sections of the survey, stated that they were not AP English Language and Composition teachers and so they did not teach synthesis writing, but that they would forward my survey invitation to the AP English teachers in their schools.

- At that same point, I also changed the subject line of the survey invitation from "Survey on synthesis writing" to "Research on synthesis writing." I made this change because it occurred to me that teachers might view a message titled "Survey" as an onerous task or something to avoid. By changing the subject line to "Research...." I thought that teachers might find the opportunity to participate in research more inviting.
- Also at that time, I changed additional language in the survey invitation. The boilerplate text of the invitation (taken from the IRB website) included the following statements: "HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE LINK BELOW. YOU MAY PRINT A COPY OF THIS LETTER TO KEEP." This language seemed to me somewhat harsh ("You must decide...") and perhaps even condescending ("You may print a copy..."). So I changed the statements above to soften the language somewhat: "HAVING READ THE INFORMATION ABOVE, PLEASE DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE LINK BELOW. PLEASE FEEL FREE TO PRINT A COPY OF THIS LETTER TO KEEP. Thank you in advance for your cooperation and participation!"
- I sent the two reminder messages to groups of states. Response rates from each mailing group increased immediately following the first reminder and then tapered off; response rates did not increase as much following the second reminder message.
- Responses to these reminder messages seem also to be linked to the completion rate of the survey. Only 851 teachers completed the full survey, which was 366 fewer than started the survey. Questions 3 and 4 of the survey were open-response items, and I

reviewed and coded each of the responses for statistical analysis. During that review, it was apparent that many of the teachers who responded later in the survey window (meaning that they would have received at least one reminder message before they began the survey) left those open-ended items blank. For Question 3, which asked respondents to define synthesis writing as they apply it in their classrooms, 239 teachers did not enter a response. For Question 4, which asked respondents to briefly describe an example of a synthesis task that they use, 315 teachers did not enter a response.

Once the survey was closed, I analyzed the survey data to determine the following:

1. If relationships exist among the attribute independent variables[13] (i.e., type of English course, geographic location, school setting, student population) and the important components of teaching of synthesis writing (the dependent variables) (Ary et al., 2002).
2. The extent or relative strength of any such relationships.
3. Whether a significant difference exists between such relationships for AP English teachers, the relationships for IB English teachers, the relationships for teachers of dual-credit English courses, and the relationships for teachers of other high school English courses.

Since most high schools have only one or two AP English teachers but several teachers of college preparatory, honors, or regular ELA courses),AP English Language and Composition teachers were not oversampled in the survey and indeed would not be the category of ELA teacher that received the most survey invitations. The response rates indicated in Table 4 seem to confirm the anecdotal feedback that many potential survey participants may have equated synthesis writing with the AP English Language and Composition course because it is required

[13] An attribute independent variable is one that cannot be actively manipulated by the researcher (Ary et al., 2002).

in that curriculum and featured on the AP Exam. If so, they may not have viewed this survey as applicable to their course or pedagogy. Conversely, it is likely that many AP English Language and Composition teachers easily identified the connection between this survey topic and their course and so were more likely to participate in the survey.

Table 4

Response rates by primary type of ELA course taught

ELA course type	Response	%
AP English Language and Composition	278	23%
College Preparatory English	232	19%
English Department curriculum course	212	18%
Honors English	201	17%
AP English Literature and Composition	114	9%
Other English course[14]	57	5%
International Baccalaureate English	44	4%
English language learner course	41	3%
Dual credit/dual enrollment English course	24	2%
Total	1,203	100%

Comparing the survey data to the numbers of respondents required for statistical significance, Table 5 clearly demonstrates that I did not obtain the required number of responses from AP English Language and Composition, IB, or dual credit teachers.

Table 5

Required response rates and obtained responses

Teacher category	Number of respondents required	Number of responses obtained
AP English Language and Composition	373	278
IB English	258	44
DE/DC English	372	24
All other English	383	857
Total	1,386	1,203

[14] "Other English", per respondents' descriptions, include courses such as ELA for special-needs students, pre-AP ELA, journalism, reading, communications, writing, and literature.

IV. Results & Analysis

Demographics

Respondents were distributed across high-school grade levels. The total number of respondents for the survey item pertaining to grade level taught was 1,182; however, the survey item asked respondents to indicate all grade levels at which their primary ELA course is offered, so the total number of responses to this item was 1,757. Table 6 provides a summary of respondents' demographics.

Table 6

Demographic summary

Demographic variable		N (%)
Grade Level	9	312 (26%)
	10	358 (30%)
	11	599 (51%)
	12	488 (41%)
Years of teaching experience		N = 857 Mean = 16.10 Mode = 10 Standard Dev. = 9.77
Years experience in current teaching assignment		N = 854 Mean = 8.52 Median = 7.00 Mode = 1
Highest degree obtained	Bachelors	175 (20%)
	Masters	590 (69%)
	Specialist	45 (5%)
	Doctorate	44 (5%)
Instructional setting:	Urban	189 (22%)
	Suburban	557 (65%)
	Rural	110 (13%)

Demographic variable		N (%)
	Online[15]	0
Student population:	500 or fewer	132 (15%)
	501 - 1,000	124 (15%)
	1,001 - 1,500	207 (24%)
	1,501 - 2,000	191 (22%)
	More than 2,000	201 (24%)
School type:	Conventional public school	618 (72%)
	Independent school	88 (10%)
	Parochial school	77 (9%)
	Public magnet school	33 (4%)
	Public charter school	20 (2%)
	Boarding/other school type[16]	20 (2%)
	Online school/course	0
Low-SES students in school	0-10%	227 (27%)
	11-25%	219 (26%)
	26-50%	207 (25%)
	51-75%	129 (15%)
	76-100%	61 (7%)

For the course that respondents identified in question 1 as their primary ELA course, over half reported that they offer the course to 11th grade students. This is not surprising, since the highest percentage of respondents teach the AP English Language and Composition course, and that course is most often offered at the 11th grade level.[17]

Only 70% of respondents provided demographic information, which was requested at the end of the survey; this suggests that the 30% of respondents who started the survey but who

[15] In the AP Course Audit ledger, most of the online providers of AP courses did not provide teachers' e-mail addresses on their websites.

[16] Respondents who selected "Other" for their school type described schools such as grade 6-12 schools and laboratory schools affiliated with universities.

[17] Of the 442,835 students who took the 2012 AP English Language and Composition Exam, 85% (376,846) took the exam as 11th-grade students (AP Program Summary Report, 2012).

didn't provide demographic information may have chosen to not finish the survey before they came to the demographic items. Respondents included teachers with one year of classroom experience to teachers with 36 or more years of experience. The mode for years of teaching experience was 10 years, and the mean was 16.10 years. The mean for years of service in their current teaching assignment (i.e., the course that they indicated as their primary assignment in survey question 1) was about half (8.52 years) of their total years of teaching experience, and the mode for years of experience in their current position was one year.

The majority of respondents reported a master's degree as the highest degree they had obtained. Over 60% of respondents indicated that they teach in a suburban school. Respondents seemed to be more evenly distributed based on the reported size of their schools, with 15% indicating that they teach at high schools with 500 or fewer students, and 24% reporting that they teach at high schools with more than 2,000 students. Over 70% of respondents indicated that they teach at conventional public schools.

The majority of respondents indicated that less than 50% of the students in their schools are from low-income families; this seems consistent with respondents' indication that most of them teach at suburban public schools. A chi-square analysis (see Appendix C, Tables C1-C3) confirmed dependent relationships among respondents' school types and the percentage of students from low-SES families (Pearson Chi Square = 134.722, $p < 0.05$). Z-tests confirmed proportionally significant differences (see Table 7).[18] The majority of respondents indicated that less than half of the students in their primary course are of nonwhite/non-Caucasian racial or ethnic minorities (see Table 8).

[18] Although 8 cells in this analysis had less than five values per cell, the large sample size negated the need for a Fisher's Exact Test.

Table 7

School type and percent of low-SES students

% low SES	School type
0-25%	The percentage of parochial schools at this level was proportionally higher; the percentages of conventional public schools and public charter schools were proportionally lower at this level.
26-50%	The percentage of public charter schools at this level was proportionally higher; the percentages of independent and parochial schools were proportionally lower at this level.
51-75%	The percentages of conventional public schools and public magnet schools were proportionally higher at this level; the percentage of independent schools was proportionally the lowest at this level.
76-100%	The percentages of conventional public schools and public charter schools were proportionally higher at this level; the percentage of parochial schools was proportionally the lowest at this level.

Table 8

Ethnic/racial minorities in respondents' primary courses[19]

Percent racial/ethnic minority	In course		In school	
	Number	Percent	Number	Percent
0 - 25%	525	61%	469	56%
26 - 50%	137	16%	184	22%
51 - 75%	101	12%	118	14%
76 - 100%	92	11%	68	8%

A chi-square analysis confirmed a dependent relationship among the levels of these two variables (percent racial/ethnic minority in the course and in the school): Pearson Chi Square = 1362.641, $p < 0.05$. Z-tests indicated no significant differences among the percentages of nonwhite students reported in respondents' courses as compared with the nonwhite populations reported in respondents' schools (see Appendix C, Tables C4-C6).

A chi-square analysis for nonwhite student population in respondents' courses and the settings of respondents' schools (see Appendix C, Tables C7-C9) indicated a dependent

[19] While the survey item collected data at the 0-10 percent and 11-25 percent levels of nonwhite students in respondents' courses and schools, that data was combined to form a 0-25 percent category for the purposes of statistical analyses.

relationship between the variables (Pearson Chi Square = 74.347, $p < 0.05$). The results were as follows (see Table 9):

Table 9

Nonwhite students in course and school setting[20]

% nonwhite population in ELA course	Significantly higher proportion
0-10%	Rural
11-25%	Suburban
26-50%	No difference among settings
51-75%	Urban
76-100%	Urban

A Chi-square analysis of the percentages of nonwhite students across school types (see Appendix C, Tables C10-C12) indicated dependence between the variables (Pearson Chi Square = 40.323, $p < 0.05$). Z-tests were conducted to determine if significant proportional differences exist among the variables[21]; Table 10 presents a summary of those results. An examination of the percentages of nonwhite students across course types (see Appendix C, Tables C13-C15), again using the chi-square and z-tests, indicated a dependent relationship between in-course student ethnicity and course type (Pearson Chi Square = 131.858, $p < 0.05$).[22] Significant differences in proportions are presented in Table 11.

[20] The 0-10 and 11-25 percent categories are used in this analysis because the differences between those two categories were significant.

[21] Although 8 cells in this analysis had less than five values per cell, the large sample size negated the need for a Fisher's Exact Test.

[22] Although the chi-square analysis indicated that 11 cells had less than 5 values per cell, the large sample size negated the need for a Fisher's Exact Test.

Table 10

School type and nonwhite students in course

% nonwhite in course	School type
0-25%	The percentage of parochial schools was proportionally highest at this level.
26-50%	The percentage of public magnet schools was proportionally highest at this level; the percentage of independent schools was proportionally lowest.
51-75%	The percentage of public charter schools was proportionally highest at this level; the percentages of independent and parochial schools were proportionally lower.
76-100%	The percentages of conventional public schools, public magnet schools, and public charter schools were proportionally higher at this level; the percentage of parochial schools was proportionally the lowest.

Table 11

ELA course type and nonwhite students in course

% nonwhite in course	ELA course type
0-25%	The percentage of dual credit courses was proportionally highest at this level; the percentage of ELL courses was proportionally the lowest.
26-50%	The percentage of IB courses was proportionally highest at this level; the percentages of AP English Literature and ELL courses were proportionally lowest.
51-75%	The percentages of ELL and "other" ELA courses were proportionally higher at this level; the percentages of AP English Language and dual credit courses were proportionally lowest.
76-100%	The percentage of ELL courses was proportionally highest at this level; the percentages of AP English Language and AP English Literature courses were proportionally lowest.

Demographic summary

Of the 1,203 respondents who began the survey, almost one quarter were AP English Language and Composition teachers, and over half of respondents teach an ELA course in the 11th grade. The mean for respondents' years of teaching experience was 16, and the mean for years teaching their current primary course was 8.5; the mode for teaching their current primary course was one year. Almost 70% of respondents reported a master's degree as their highest degree earned. Over 60% of respondents teach in suburban schools, and almost 70% teach in large, conventional public schools (1,000 students or more). Students in respondents' courses are

mostly white and of middle or high economic status: almost 80% of respondents reported less than half of the students in their courses are nonwhite or from low-SES households. Teachers of ELL and "other ELA courses" reported the highest proportions of nonwhite students, while teachers of AP English Language, AP English Literature, and dual-credit courses reported the lowest proportions of nonwhite students.

Research Question 1: How Do English Teachers Reportedly Define Synthesis Writing In Their Courses?

Defining synthesis writing.

One question on the survey asked respondents to define synthesis writing in their own words. I conducted content analyses (Ary et al., p. 442) to identify patterns in teachers' definitions of "synthesis writing." While reviewing the first 150 responses, I identified key words and phrases that recurred in the responses; I then created categories based on those key words and phrases, and I refined these categories by application of the constant comparative method (Ary et al., pp. 467-469). Table 12 presents the 12 categories of synthesis writing definitions that I identified via this process.

Next, I assigned numeric codes to each category and then coded each response. The frequency of definitions falling under each category was calculated, as was the percentage of all survey participants who offered definitions in each category. Table 13 presents the definitions in descending order of frequency of use.

Table 12

Categories for coding definitions of synthesis writing

Category	Criteria	Example
Original argument/thesis[23]	References development of an argument original to the student's rhetorical purpose	*Students use a variety of sources (including visual argument) to compose an argument of their own, using the sources as support or in counter-argument.*
Literary argument	References student creation of an argument based on two or more works of imaginative literature	*The final project asks them to make an argument using 2 literary texts and 1 or 2 outside sources (literary criticism, historical background, etc.).*
Original perspective/analysis	References inclusion of a student's own ideas/conclusions, informed by source materials; no specific reference to creation of an argument	*Weaving together evidence from multiple sources to expose a new or more nuanced meaning (than what could be drawn from once source alone).*
Argument	References development of an argument, but there is no clear indication that the argument should be original to the student (i.e., the position taken in the argument could be mandated by the teacher)	*Synthesis writing explicitly incorporates multiple sources to be evaluated for their contribution as support for a position or claim.*
Rhetorical analysis	Emphasis on analysis of rhetorical strategies/techniques across source materials; no specific reference to student creation of an argument	*Students read a variety of newspaper articles by a single syndicated columnist. They analyze syntax, tone, diction, and various other rhetorical devices in order to create a rhetorical analysis.*
Analysis of themes/ideas	Emphasis is on analyzing themes or ideas across source materials; no specific reference to student creation of an argument	*Drawing from multiple texts, fictional or nonfiction, in an effort to identify unifying themes or ideas, or to contrast ideas.*
Connecting to other texts/topics	Emphasis is on identifying connections among source materials; no specific reference to student creation of an argument	*Synthesis is taking material from one or more primary sources and relating it to literature and/or current events.*
Literary analysis	Emphasis is on analysis of two or more works of imaginative literature; no specific reference to student creation of an argument	*Using several sources of information in writing one paper. For example, writing about the American Dream as it applies to The Great Gatsby, Death of a salesman, and Ethan Frome.*

[23] Use of the term *thesis*, even absent the term *argument*, was still viewed as referencing an argument, per the common use of *thesis* as a primary component of an argument (DiYanni & Hoy, 2001; Axelrod & Cooper, 2010; White & Billings, 2011).

Category	Criteria	Example
Prompt response	Prompt provided by teacher limits range of possible responses; no reference to inclusion of the student's original rhetorical purpose; source materials usually specified or limited by the teacher	*I provide students with AP-style prompts that include six to seven excerpts of various readings (for each writing prompt). Students must respond to the prompt by making their own arguments and then must use the accompanying sources to support their arguments.*
Summary	Emphasis on explaining or integrating information from source materials; no specific reference to student creation of an argument	*I expect my students to collect two or more resources and synthesize the information to offer a well-rounded, thorough explanation of the combined resources.*
Composition support	References use in student writing of information from source materials, but the type of writing isn't specified, nor is specific reference made to student creation of an argument	*Taking from multiple sources and producing work.*
No synthesis	Does not reference use of multiple source materials	*Engaging with the text: highlighting key points and responding to the text, extending it and taking a position on the facts presented.*

Table 13

Frequency of synthesis definition

Teacher's synthesis definition		Frequency	Valid %
Valid	Original argument/thesis	214	22.1
	Composition support	204	21.1
	No synthesis	134	13.9
	Original perspective/analysis	110	11.4
	Argument	89	9.2
	Prompt response	73	7.5
	Connecting to texts/topics	50	5.2
	Analysis of themes/ideas	34	3.5
	Literary analysis	30	3.1
	Summary	21	2.2
	Rhetorical analysis	5	.5
	Literary argument	3	.3
	Total	967	100.0
Missing		250	
Total		1217	

That "Original argument/thesis" was the most frequently cited type of synthesis definition is not surprising, since 23% of survey participants were AP English Language and Composition teachers, and of those 38% defined synthesis writing in this way (see Table 14). Over 20% of respondents defined synthesis writing in such vague terms that the type of writing intended could not be determined, so those responses were categorized under the general heading "composition support." Another 13% of respondents defined synthesis writing in such a way that no real synthesis (i.e., use of multiple source materials to inform the student's writing) was evident. The percentages for the "composition support" and "no synthesis" categories were each higher than those for respondents defining synthesis as an argument or as the application of a student's original perspective or analysis.

I also analyzed respondents' definitions of synthesis writing by the type of ELA course they primarily teach (see Appendix D, Tables D1 and D2). Table 14 presents a summary of the frequencies and percentages of types of definition use by teachers of different course types. More AP English Language and Composition teachers and teachers of dual-credit courses defined synthesis writing as creating an original argument or thesis, an original perspective or analysis, or an argument than did teachers of other ELA course types. More AP English Language and Composition teachers also used definitions that fell into the "Prompt response" category than did teachers of other ELA courses. Lastly, over half of respondents who teach ELL courses provided definitions that did not address synthesis writing as previously defined.

Table 14

Synthesis definitions by course type

Synthesis definition	Course-type comparisons
Original argument/thesis	38.3% of AP English Language and Composition teachers defined synthesis writing this way, proportionally more than teachers of any other course type. Dual-credit teachers were least likely to define synthesis this way.
Original perspective/analysis	19% of dual credit teachers defined synthesis writing this way, proportionally more than teachers of other course types. IB teachers were the least likely to define synthesis this way.
Argument	14.3% of dual credit teachers defined synthesis writing this way, proportionally more than teachers of any other course type. ELL teachers were the least likely to define synthesis this way.
Literary argument	There was no proportionally significant difference among teachers of any English course in the frequency with which they used this definition; only three respondents defined synthesis writing this way.
Rhetorical analysis	2.6% of teachers of IB and "other English" courses defined synthesis writing this way, proportionally more than teachers of any other course type (although only one teacher in each category and a total of only 5 respondents from all course types used this definition).
Analysis of themes/ideas	5.9% of teachers of college prep ELA courses used this definition, proportionally more than teachers of other course types.
Connecting to other texts/topics	7.8% of teachers of honors ELA courses and 8.2 % of teachers of regular ELA courses defined synthesis writing this way, proportionally more than teachers of the other course types.
Literary analysis	11.4% of teachers of AP English Literature and Composition and 13.2 % of teachers of IB English courses used this definition, proportionally more than teachers of other types of courses.
Prompt response	12.5% of AP English Language and Composition teachers defined synthesis writing this way, proportionally more than teachers of any other course type.
Summary	3.8% of teachers of regular English courses used this definition, proportionally more than teachers of the other courses.
Composition support	25.7% of teachers of college prep and 25.5% of teachers of honors English courses used this definition, proportionally more than teachers of other types of courses. 21.6% of AP English Literature teachers and 22% of teachers of regular ELA courses also defined synthesis this way, making it the most frequently used definition for those courses as well.
No synthesis	57.7% of teachers of ELL courses used a definition that fell into this category, proportionally more than teachers of other types of courses. 26.3% of IB teachers, 33.3% of dual-credit teachers, and 20.5% of teachers of "other" ELA courses also defined synthesis this way, making it the most frequently used definition for those courses, as well.

Following the survey item asking teachers to define synthesis writing, respondents were also asked to select one of five provided definitions as best aligning with their conception of

synthesis writing; those five definitions align with Flower et al.'s (1990) description of five types of products of synthesis writing:

- Identify key words in paragraphs, summarizes paragraphs, and constructs a composition around the sets of summaries. (Summary)
- Use source texts as a starting point for one's own ideas or respond to the topic in general. (Response to topic)
- Add one's own comments to a summary or review of source texts. (Review and comment)
- Identify or create a unifying theme or controlling concept from the source materials, then organize around that concept a text original to the student writer. (Original theme-focused text, or Synthesis)
- Use source materials to select and organize information to address a specific audience and create an argument original to the student writer. (Interpretation for a rhetorical purpose)

Table 15 presents the frequencies and percentages of respondents' selections.

Table 15

Selection of given definitions of synthesis writing

		Frequency	Valid %
Valid	Summary	17	1.8
	Response to topic	107	11.1
	Review and comment	2	0.2
	Original theme-focused text	365	37.9
	Interpretation for a rhetorical purpose	472	49.0
	Total	963	100.0
Missing	System	254	
Total		1217	

When presented with definitions of synthesis writing, most respondents (86.9%) indicated that their understanding of the term is the use of source materials to create an original theme-focused text or interpret those materials for a rhetorical purpose, the two types of synthesis writing that the literature suggests are most valued in academic studies. This clearly conflicts with the data from respondents' own definitions of synthesis writing (see Table 13). In order to make a more direct comparison, I coded each of respondents' own definitions of synthesis writing to the Flower definition that it best matched (see Table 16).

Table 16

Respondents' definitions of synthesis writing coded to Flower's definitions

		Frequency	Valid %
Valid	Summary	28	2.9
	Response to topic	88	9.1
	Review and comment	21	2.2
	Original theme-focused text	171	17.7
	Interpretation for a rhetorical purpose	313	32.4
	No alignment	346	35.8
	Total	967	100.0
Missing	System	250	
Total		1217	

Based on respondents' own definitions of synthesis writing, 68.2% of them understand the term as using source materials to create an original theme-focused text or interpret those materials for a rhetorical purpose, the two types of synthesis writing that the literature suggests are most valued in academic studies; this is clearly less than the 86.9% indicated in the preceding data (Table 15).

I conducted chi-square analyses to determine if dependent relationships exist between respondents' definitions of synthesis writing and other variables, such as years of teaching experience, school setting, school type, percent of low-SES students in the school, and percent of

nonwhite students in respondents' courses. Such analyses found these variables to be independent (see Appendix D, Tables D3-D7).

Synthesis definition summary.

When asked to provide a definition of synthesis writing, over 20% of respondents described the use of source materials in service of an original argument or thesis; this definition was given by proportionally more AP English Language and Composition teachers than teachers of other courses. (AP English Language teachers comprised 23% of all survey responses.) AP English Language and Composition teachers provided proportionally more definitions that fell into the "Prompt response" category.

Twenty percent of respondents gave vague definitions, and 13% gave definitions that didn't actually describe the use of multiple source materials; teachers of ELL courses comprised over half (57%) of all responses in the latter category. Teachers of dual-credit courses provided proportionally more definitions that fell into the "original perspective or analysis" or "argument" categories, which is possibly a function of the college curricula that are used in their courses.

When asked to select one of five provided definitions (based on work by Flower et al., 1990) that best aligns with their own concept of synthesis writing, over 80% of respondents selected "Creation of an original theme-focused text" or "Interpretation for a rhetorical purpose." However, when I coded respondents' own definitions of synthesis writing to those five definitions, only 50% aligned with those same two definitions. Furthermore, my coding resulted in 35% of respondents' own definitions not aligning with any of the five provided definitions..

Examples of synthesis-writing tasks.

Survey respondents were also asked to briefly define a synthesis task that they might assign to students. (It is interesting to note that when the respondents were asked to define synthesis writing, many of them instead described a synthesis task.) Those task examples were then coded to the 12 previously identified definitions of synthesis; Table 17 shows the frequencies and percentages of task examples aligned with those 12 definitions.

Table 17

Examples of synthesis tasks coded to definitions of synthesis writing

		Frequency	Valid %
Valid	Prompt response	262	29.2
	No synthesis	183	20.4
	Original argument/thesis	123	13.7
	Composition support	73	8.1
	Literary analysis	54	6.0
	Original perspective/analysis	45	5.0
	Connecting to texts/topics	44	4.9
	Analysis of themes/ideas	39	4.4
	Argument	25	2.8
	Summary	23	2.6
	Literary argument	14	1.6
	Rhetorical analysis	11	1.2
	Total	896	100.0
Missing	System	321	
Total		1217	

Table 18 presents a comparison of the distribution of respondents' definitions of synthesis writing and their descriptions of synthesis-writing tasks coded to those same definitions. The far right column shows the difference between the frequency of respondents' definitions that aligned with a particular category and the frequency of respondents' descriptions of synthesis tasks that aligned with that same category. Positive numbers in that column indicate that the percentage of task examples that aligned with a definition category was higher than the percentage of definition

responses that aligned with that category; negative numbers in that column indicate that the percentage of task examples aligned with a definition category was lower than the percentage of definition responses that aligned with that category.

Table 18

Alignment of definitions of synthesis writing with examples of synthesis tasks

Definition of synthesis writing	% using definition	% task examples aligned with definition	% variance of task example
Prompt response	7.5	29.2	+21.7
No synthesis	13.9	20.4	+6.5
Literary analysis	3.1	6.0	+2.9
Literary argument	0.3	1.6	+1.3
Analysis of themes/ideas	3.5	4.4	+0.9
Rhetorical analysis	0.5	1.2	+0.7
Summary	2.2	2.6	+0.4
Connecting to texts/topics	5.2	4.9	-0.3
Argument	9.2	2.8	-6.4
Original perspective/analysis	11.4	5.0	-6.4
Original argument/thesis	22.1	13.7	-8.4
Composition support	21.1	8.1	-13.0

The data previously reviewed indicated that over 80% of respondents (see Table 15) thought that their definitions of synthesis writing aligned with either of the two types of synthesis writing valued in higher academic study (Flower et al., 1990): using source materials to (a) organize an original text around a central idea or theme, or (b) in service of the student's rhetorical purpose. However, when the definitions of synthesis writing that respondents provided were coded to Flower's categories, just over 68% aligned to those same two categories (see Table 16). Furthermore, Table 18 shows that in some instances respondents' descriptions of synthesis-writing tasks, when coded to the 12 types of synthesis writing identified from the respondents' own definitions, vary significantly from those definitions. In other words, the tasks that respondents described as examples of synthesis writing often do not align with their own

definitions of synthesis writing, which in turn do not often align with definitions of the types of synthesis writing most valued in higher education.

As Table 18 indicates, far more respondents described synthesis tasks that aligned with the definition "Prompt Response" (prompt provided by teacher limits range of possible responses; no reference to inclusion of the student's original rhetorical purpose; source materials usually specified or limited by the teacher) than who defined synthesis writing that way themselves.[24] Conversely, fewer respondents described synthesis-writing tasks that actually indicated argument, creation of an original perspective or analysis, or an original argument or thesis than who provided definitions that fit those categories. Again, many respondents' concepts of implementation of synthesis writing seem different from their concepts of synthesis writing itself. While 21.1% of respondents provided a definition of synthesis writing that fell into the category "Composition support" (references use in student writing of information from source materials, but the type of writing isn't specified, nor is specific reference made to student creation of an argument), only 8.1% of respondents described a synthesis-writing task which aligned with that definition.

I also found that the descriptions of synthesis-writing tasks differed significantly by ELA course type (see Appendix E, Tables E1-E3). The results indicated significant differences (Pearson Chi Square = 168.558[25], $p < .05$); Table 19 presents a summary of the analysis of the z-test for equivalent proportions.

[24] I focus on the "prompt response" category because it describes tasks where teachers provide a specific prompt and specific resources for use in the task, limiting students' abilities to explore various aspects of topics, how they respond to topics, and/or use a variety of resources pertaining to that topic. This seems to also limit students' abilities to invent a complex concept or purpose for writing, which Flower et al. (1990) suggested requires a higher degree of cognition and leads to greater knowledge transformation.

[25] 63 cells (58.3%) have expected count less than 5. The minimum expected count is .25.

Table 19

Synthesis definitions and examples of synthesis tasks by course type

Synthesis task definition	Course-type comparisons
Original argument/thesis	30% of teachers of dual-credit ELA courses described synthesis-writing tasks that aligned with this definition, proportionally more than teachers of other ELA courses.
Original perspective/analysis	7.7% of teachers of honors ELA courses described synthesis-writing tasks that aligned with this definition, proportionally more than teachers of other ELA courses.
Argument	5.4% of teachers of IB English courses described synthesis-writing tasks that aligned with this definition, proportionally more than teachers of other ELA courses.
Literary argument	3.9% of teachers of AP English Literature and Composition described synthesis-writing tasks that aligned with this definition, proportionally more than teachers of other ELA courses.
Rhetorical analysis	5.7% of teachers of dual-credit ELA courses described synthesis-writing tasks that aligned with this definition, proportionally more than teachers of other ELA courses.
Analysis of themes/ideas	Teachers of ELL, college prep, and regular ELA courses described synthesis-writing tasks that aligned with this definition significantly more frequently than did teachers of other types of ELA courses.
Connecting to other texts/topics	There was no significant difference in the rates at which teachers of various ELA courses described synthesis-writing tasks that fit this definition.
Literary analysis	16.9% of teachers of AP English Literature and Composition described synthesis-writing tasks that aligned with this definition, significantly more than teachers of other ELA courses. Teachers of AP English Language and "other" ELA courses were least likely to describe synthesis-writing tasks that aligned with this definition.
Prompt response	43.6% of teachers of AP English Language and Composition described synthesis-writing tasks that aligned with this definition, significantly more than teachers of other ELA courses. This definition also aligned most often with descriptions of synthesis-writing tasks for teachers of AP English Literature, honors ELA, and college prep ELA courses.
Summary	There was no significant difference in the rates at which teachers of various ELA courses described synthesis-writing tasks that fit this definition.
Composition support	21.6% of teachers of IB English described synthesis-writing tasks that aligned with this definition, significantly more than teachers of other ELA courses.
No synthesis	55% of teachers of ELL courses described synthesis-writing tasks that aligned with this definition, significantly more than teachers of other ELA courses. This definition also aligned most often with descriptions of synthesis-writing tasks for teachers of IB, dual credit, regular ELA, and "other" ELA courses.

Table 20 shows the comparison of these course-type alignments of synthesis definitions and synthesis tasks.

Table 20

Alignment of course types to synthesis definitions and synthesis tasks

Synthesis definitions	Highest % course type(s) by teacher definition	Highest % course type by task description
Original argument/thesis	AP English Language (38.3%)	Dual credit (30%)
Original perspective/analysis	Dual credit (19%)	Honors (7.7%)
Argument	Dual credit (14.3%)	IB (5.4%)
Literary argument	n/a	AP English Literature (3.9%)
Rhetorical analysis	IB, "Other ELA" (2.6%)	Dual credit (5.7%)
Analysis of themes/ideas	College prep (5.9%)	ELL (10%), college prep (6.2%), regular ELA (6.2%)
Connecting to other texts/topics	Regular ELA (8.2%), honors ELA (7.8%)	n/a
Literary analysis	IB (13.2%), AP English Literature (11.4%)	AP English Literature (16.9%)
Prompt response	AP English Language (12.5%)	AP English Language (43.6%)
Summary	Regular ELA (3.8%)	n/a
Composition support	College prep (25.7%), honors ELA (25.5%)	IB (26%)
No synthesis	ELL (57.7%)	ELL (55%)

Although only 9.5% of teachers of dual-credit ELA courses defined synthesis as using source materials to create an original argument or thesis (and a third of such respondents provided definitions that didn't actually indicate the use of multiple source materials), 30% of them described synthesis tasks that aligned with this definition. However, dual-credit teachers also had the highest percentages of synthesis-writing definitions that aligned with the categories "original perspective/analysis" and "argument", but they did not have the highest percentages of synthesis tasks that aligned with those categories. ELL teachers had the highest percentages of synthesis writing definitions and synthesis tasks that aligned with the category "no synthesis."

I also conducted chi-square analyses to determine whether a dependent relationship exists between respondents' descriptions of synthesis tasks and other variables such as school setting, school type, percent of low-SES students in the school, percent of nonwhite students in their ELA courses, and years of teaching experience. Table 21 presents a summary of those results.

Table 21

Descriptions of synthesis tasks and other variables

Variable	Pearson Chi Square	Asymp. Sig. (2-sided)	Conclusion
School setting	26.376	0.236	Independent
School type	72.054	0.285	Independent
Percent low-SES students in school	45.204	0.421	Independent
Percent nonwhite students in course	50.724	0.025	Dependent
Years teaching experience	68.258	0.400	Independent

Since the ethnicity of students in the ELA course was the only variable to indicate a dependent relationship with respondents' descriptions of synthesis tasks, Z-tests were conducted to determine equivalent proportions (see Appendix E, Tables E8-E10); Table 22 presents a summary of those tests.

Table 22

Definitions of synthesis task by percent nonwhite students in ELA course

Synthesis task description	Relation with % nonwhite students in ELA course
Original argument/thesis	There were no significant differences in proportional use of this definition across categories of percentage of nonwhite students.
Original perspective/analysis	There were no significant differences in proportional use of this definition across categories of percentage of nonwhite students.
Argument	There were no significant differences in proportional use of this definition across categories of percentage of nonwhite students.
Literary argument	Respondents from schools with 51-75% nonwhite students had proportionally the highest use of this category; those from schools with 26-50% nonwhite students had the lowest use.
Rhetorical analysis	There were no significant differences in proportional use of this definition across categories of percentage of nonwhite students.
Analysis of themes/ideas	Respondents from schools with 51-75% nonwhite students had proportionally the highest use of this category; those from schools with 0-25% nonwhite students had the lowest use.
Connecting to other texts/topics	There were no significant differences in proportional use of this definition across categories of percentage of nonwhite students.
Literary analysis	There were no significant differences in proportional use of this definition across categories of percentage of nonwhite students.
Prompt response	Respondents from schools with 51-75% nonwhite students had proportionally the highest use of this category; those from schools with 76-100% nonwhite students had the lowest use.

Synthesis task description	Relation with % nonwhite students in ELA course
Summary	There were no significant differences in proportional use of this definition across categories of percentage of nonwhite students.
Composition support	There were no significant differences in proportional use of this definition across categories of percentage of nonwhite students.
No synthesis	Respondents from schools with 76-100% nonwhite students had proportionally the highest use of this category; those from schools with 51-75% nonwhite students had the lowest use.

Respondents who reported more than 75% of their ELA students as nonwhite provided the highest proportion of definitions that did not reflect synthesis of multiple source materials. This may suggest that more professional development regarding the teaching of synthesis writing is necessary for teachers of such student populations.

Synthesis task summary.

Almost a third of respondents described synthesis tasks that fell into the "Prompt response" category, a rate 20% higher than respondents' definitions of synthesis writing which fell into that category. Over 38% of AP English Language and Composition teachers defined synthesis writing as the creation of an original argument or thesis, but over 40% of their descriptions of synthesis-writing tasks fell into the "Prompt response" category.

Thirty percent of teachers of dual-credit courses described synthesis tasks that fell into the "original argument or thesis" category, even though only 9% of those respondents defined synthesis writing that way. As with their definitions of synthesis writing, teachers of ELL courses had the highest percentage of synthesis-task descriptions that fell into the "no synthesis" category. Variables such as school setting, type of school, percentage of low-SES students, and years of teaching experience do not appear to have any dependent relationship with the way respondents described synthesis-writing tasks. The percentage of nonwhite students in respondents' ELA courses did, however, indicate a significant relationship with respondents'

descriptions of synthesis-writing tasks. Respondents whose students are 51-75% nonwhite had significantly higher rates of task descriptions that fell into the "Prompt response," "literary argument," and "analysis of themes or ideas" categories. Those whose students are 76-100% nonwhite had a significantly higher rate of descriptions that fell into the "no synthesis" category.

Research Question 2: To What Extent Do English Teachers Reportedly Provide Explicit Or Direct Instruction on the Strategies Involved in Synthesis Writing?

The survey asked respondents about the frequency with which they provide instruction on synthesis writing. Ninety-seven percent of respondents answered this question, and Table 23 presents a summary of their responses.

Table 23

Frequency of providing synthesis-writing tasks

Frequency	Number of responses	% of responses
Daily	70	6%
Weekly	432	37%
Monthly	375	32%
Once per quarter	167	14%
Once per semester	77	7%
Once each academic year	35	3%
Not at all	13	1%
Total	1,169	100%

I conducted chi-square analyses to determine if dependent relationships exist between frequency of synthesis-writing tasks and various other variables.[26] Such tests for school setting, type of school, percent of low-SES students in the school, percent of nonwhite students in the school, examples of synthesis tasks, and years of teaching experience indicated no dependent relationships with frequency of synthesis-writing tasks (see Appendix F, Tables F1-F6). Such

[26] For the purposes of these analyses, I consolidated the survey responses for frequency of synthesis writing into five categories*: 1-2 times per week, monthly, 2-4 times per academic year, once per year,* or *not at all.*

analyses did, however, show dependent relationships for ELA course type, percent of nonwhite students in the ELA course, and respondents' definitions of synthesis writing. The analysis of frequency of synthesis-writing tasks and ELA course type yielded the following results: Pearson Chi Square = 70.000, $p < 0.05$ (see Appendix F, Tables F7-F9) [27]. Z-tests were used to determine equivalent proportions; Table 24 presents a summary of those data.

Table 24

Frequency of synthesis-writing tasks by ELA course type

Frequency	ELA course type
Once or more per week	Teachers of dual-credit courses had the highest proportion of responses in this category. AP English Language teachers had the lowest proportion of responses.
Monthly	AP English Language teachers had the highest proportion of responses in this category. There were no significant differences in response proportions among teachers of other ELA courses.
2-4 times per year	Teachers of honors ELA courses had the highest proportion of responses in this category. Teachers of "other" ELA courses had the lowest proportion of responses.
Not at all	Teachers of AP English Literature courses had the highest proportion of responses in this category; teachers of college preparatory courses had proportionally the fewest responses.

The test of frequency of synthesis-writing tasks and percent of nonwhite students in respondents' ELA courses yielded the following results: Pearson Chi Square = 17.092, $p < 0.05$. Z-tests were again used to determine equivalent proportions (see Appendix F, Tables F10-F12)[28]; Table 25 presents a summary of those data.

[27] Although the chi-square analysis indicated that 9 cells had less than the expected frequency of 5, the large sample size negated the need for a Fisher's Exact test.

[28] Although the chi-square analysis indicated that 3 cells had less than the expected frequency of 5, the large sample size negated the need for a Fisher's Exact test.

Table 25

Frequency of synthesis-writing tasks by percent of nonwhite students in ELA course

Frequency	% nonwhite students in ELA course
Once or more per week	Respondents who reported 76-100% nonwhite students in their ELA course had proportionally the highest number of responses in this category. Respondents who reported 0-25% nonwhite students in their ELA course had proportionally the lowest number of responses.
Monthly	Respondents who reported 0-25% nonwhite students in their ELA course had proportionally the highest number of responses in this category. Respondents who reported 51-75% nonwhite students in their ELA course had proportionally the lowest number of responses.
2-4 times per year	Respondents who reported 51-75% nonwhite students in their ELA course had proportionally the highest number of responses in this category. Respondents who reported 76-100% nonwhite students in their ELA course had proportionally the lowest number of responses.
Not at all	There were no significant differences among responses for this category.

The test of frequency of synthesis-writing tasks and respondents' definitions of synthesis writing yielded the following results: Pearson Chi Square = 75.933, $p < 0.05$. Z-tests were again used to determine equivalent proportions (see Appendix F, Tables F13-F15).[29] Table 26 presents a summary of those data.

Table 26

Frequency of synthesis-writing tasks and respondents' definitions of synthesis writing

Frequency	Respondents' definition of synthesis writing
Once or more per week	Respondents who provided definitions that were categorized as "no synthesis" had the highest proportion of responses in this category.
Monthly	Respondents who provided definitions that were categorized as "Prompt response" had the highest proportion of responses in this category.
2-4 times per year	Respondents who provided definitions that were categorized as "no synthesis" had the lowest proportion of responses in this category.
Not at all	Respondents who provide definitions categorized as "literary analysis" had the highest proportion of responses in this category.

[29] Although the chi-square analysis indicated that 19 cells had less than the expected frequency of 5, the large sample size negated the need for a Fisher's Exact test.

The survey also asked respondents to describe the frequency with which they provide instruction on the types of skills or strategies identified in the literature review of this study as important for synthesis writing. Table 27 presents a summary of those findings; the parenthetical numbers in the column headings are the values assigned to each response for the purpose of determining mean scores for each strategy category, and the rows are arranged in descending order of mean scores.

Table 27

Frequency of instruction on synthesis-writing strategies

Strategy	Every assign. (4)	Most assign. (3)	Some assign. (2)	No assign. (1)	Number	Mean
Understand type of writing task	655	170	69	12	906	3.62
Consider audience for the writing task	551	221	120	14	906	3.44
Integrate source materials into student-generated analysis, argument, or interpretation with a specific rhetorical purpose	526	265	100	14	905	3.44
Integrate information from various source materials	510	258	134	4	906	3.41
Select appropriate source materials, based on context of writing task	515	245	138	9	907	3.40
Understand organizational structures for argumentative synthesis and expository writing	500	269	126	13	908	3.38
Balance information from source materials with prior knowledge	395	351	140	17	903	3.24
Understand discourse expectations of academic English	434	271	168	28	901	3.23
Understand rhetorical context of writing task	435	259	174	35	903	3.21
Read source materials rhetorically	337	309	214	45	905	3.04

I conducted a reliability analysis on these items, which yielded a Cronbach's Alpha score of 0.818 (see Appendix G, Tables G2-G4). The analysis also indicated that removal of any of the scale items would not raise the reliability score. A multivariate analysis confirmed that the differences among the means are significant (see Appendix G, Tables G5-G12). Mauchly's test

indicated that the assumption of sphericity had been violated: $\chi^2(44) = 532.89$, $p < 0.05$. Therefore, a corrected value (Greenhouse-Geisser correction) of F was used (0.880), indicating that the variances between means are significantly different.

With high mean scores, ranging from 3.04 to 3.62, and a modal score of 4 (providing instruction in every assignment) for every skill category, most respondents clearly felt that they were addressing each of these skills frequently. "Understanding the type of writing task" seems to be the strategy most often addressed by respondents, with a mean score significantly higher than all others. The mean for "Consider audience for the writing task" was significantly higher than all others except "Understand the type of writing task" and "Integrate source materials..." The strategy "Reading source materials rhetorically" had a mean score significantly lower than all others and seems to be the strategy addressed least often in respondents' instruction.

Since all respondents would hypothetically provide responses for each of these strategies (which were featured together in the same survey item; see Appendix B, item #7), and since values of 1-4 were assigned to each response choice for each item[30], I was able to construct a scoring scale which could be used to compare the slate of synthesis-strategy responses to other dependent variables. I used those scaled scores and criterion coding of the independent variables to conduct a backward regression analysis to determine if any independent variables were significant predictors of respondents' instruction on the identified synthesis strategies (see Appendix G, Tables G13-G24). The analysis indicated that the following five independent variables are the most statistically significant predictors, $F(5, 732) = 23.743$, $p < .001$, $R^2 = .140$:

[30] Originally these response choices were coded 0-3, but because SPSS setting required the use of "0" to indicate missing items, I needed to change the response codes to a 1-4 scale.

Table 28

Significant predictors of frequency of instruction on synthesis strategies

	Mean	Std. Deviation	N
Synthesis-task example	3.3495	.07246	738
School type	3.3480	.02902	738
Years teaching experience	3.3471	.08609	738
Synthesis definition	3.3457	.07734	738
ELA course	3.3227	.19347	738

The mean for synthesis-task example was significantly higher than those for the other four independent variables; the mean for ELA course type was significantly lower than those for the other four independent variables. School setting, percent of low-SES students in the school, percent of nonwhite students in the ELA course, and frequency of synthesis-writing tasks were not significant predictors of frequency of instruction on synthesis-writing strategies. One-way ANOVAs were then conducted for each of the significant predictors to determine where significant differences lie among the categories of those predictors (see Appendix G, Tables G25-G35). The results of those ANOVAs are as follows:

- **ELA course type**: $F(8, 899) = 12.771$, $p < .001$.
    - The mean score for AP English Language and Composition teachers was significantly higher than the scores of all other respondents except teachers of AP English Literature and Composition or dual credit courses.
    - The mean score for teachers of ELL courses was significantly lower than the scores for all other respondents except those who teach regular English courses.
- **School type**: $F(5, 831) = .767$, $p = .573$. This analysis indicated that there is no significant difference among the mean scores of categories of school type, suggesting that

this variable may not actually be a significant predictor of frequency of instruction on synthesis strategies.

- **Years of teaching experience**: $F(6, 831) = 4.612$, $p < .001$. The mean score for respondents with five years or fewer of teaching experience was significantly lower than the mean scores of respondents with 16-25 or 31 or more years of teaching experience.
- **Definition of synthesis writing**: $F(11, 822) = 1.931$, $p = .032$. Tukey's post hoc test indicated no significant differences among the mean scores of the categories of *synthesis-writing* definitions, which suggests that such definitions may not actually be significant predictors of respondents' frequency of instruction on synthesis strategies.
- **Examples of synthesis tasks**: $F(11, 793) = 1.649$, $p = .081$. This analysis indicated that there is no significant difference among the mean scores of categories of definitions of synthesis tasks, suggesting that this variable may not actually be a significant predictor of frequency of instruction on synthesis strategies.

Summary of Instruction on synthesis strategies.

Thirty-two percent of respondents indicated that they provide opportunities for students to engage in synthesis writing on a monthly basis, and 37% reported providing such opportunities weekly. Table 29 presents a summary of the analyses regarding respondents' reported frequency of providing opportunities for synthesis writing.

The literature on synthesis writing identifies 10 strategies that are conducive to effective synthesis writing. Most respondents reported providing instruction on these strategies for every or most assignments. The most frequently taught strategy is understanding the topic of the writing task; the strategy taught least frequently is reading source materials rhetorically.

Table 29

Frequency of opportunities for synthesis writing by variables

Frequency category	Proportionally higher scale scores	Proportionally lower scale scores
At least once per week	Dual-credit teachers "No synthesis" definition 76-100% nonwhite in course	AP English Language teachers 0-25% nonwhite in course
Monthly	AP English Language teachers "Prompt response" definition 0-25% nonwhite in course	"Summary" definition 51-75% nonwhite in course
2-4 times per year	Honors English teachers "No synthesis" definition 51-75% nonwhite in course	76-100% nonwhite in course
Not at all	AP English Literature teachers "Literary analysis" definition	College-prep teachers

Regression analysis indicated that the frequency of providing opportunities for synthesis writing had no significant effect on the frequency with which the synthesis-writing strategies are taught. Similar tests for school setting, percentage of nonwhite students in the ELA course, and percentage of low-SES students in the school likewise indicated that those variables do not have a significant effect on the frequency with which the synthesis-writing strategies are. Subsequent ANOVAs also eliminated school type, definition of synthesis writing, and examples of synthesis tasks as significant predictors of frequency of instruction on synthesis strategies.

The type of ELA course respondents teach and their years of teaching experience were, however, identified as significant predictors of frequency of instruction on synthesis strategies. Respondents who teach AP English Language and Composition had significantly higher mean scores for frequency of instruction on synthesis strategies than did respondents who teach other ELA courses except AP English Literature and Composition and dual-credit ELA courses. Respondents who teach ELL or regular English courses had means scores that were significantly lower than those of teachers of all other ELA course types. Additionally, respondents with five

years or fewer of teaching experience had significantly lower mean scores than did respondents who have 16-25 or 31 or more years of teaching experience.

Research Question 3: What Are the Characteristics of Instruction on Synthesis Writing That English Teachers Report Providing?

The survey asked respondents to indicate the frequency with which they use nine pedagogical strategies that are identified in the literature as being conducive to effective synthesis writing. Table 30 summarizes their responses; the parenthetical numbers in the column headings are the values assigned to each response for the purpose of determining mean scores for each strategy category, and the rows are arranged in descending order of mean scores.

Table 30

Response frequency for pedagogy strategies

Pedagogical strategy	Every assign. (4)	Most assign. (3)	Some assign. (2)	No assign. (1)	Number	Mean	Mode
Ensure student understanding of the specific type of writing task	723	129	24	0	876	3.80	4
Provide feedback to student writing	650	186	36	0	872	3.70	4
Scaffold student learning	412	310	126	21	869	3.28	4
Provide opportunities for students to review and reflect on their synthesis writing	332	327	200	14	873	3.12	4
Model synthesis writing	301	319	235	18	873	3.03	3
Provide opportunities for cooperative/collaborative learning	278	327	250	16	871	3.00	3
Provide opportunities for peer feedback to student writing	246	327	272	26	871	2.91	3
Encourage or provide opportunities for students to utilize Web-based information sources when engaging in synthesis writing	256	268	310	39	873	2.85	2
Encourage or provide opportunities for students to utilize multimedia publication of their work product when engaging in synthesis writing	106	186	382	196	870	2.23	2

The data seem to indicate that respondents frequently help students understand their specific writing tasks and provide feedback to students about their writing, but they less frequently structure synthesis-writing assignments so that students can use Internet resources or electronic publication of their writing. This seems consistent with the high rate of respondents' definitions of synthesis writing and synthesis tasks that were coded as "Prompt Response," where specific resource materials are usually provided to the students, rather than having students conduct research to find their own resources.

A multivariate analysis confirmed that the differences among the means are significant (see Appendix H, Tables H1-H17). Tests of within-subjects effects yielded an *F* score of 402.707, indicating that sphericity is assumed. A corrected value (Greenhouse-Geisser correction) of *F* was used (0.843), indicating that the variances between means are significantly different.

I conducted a reliability test to determine the internal consistency of the items in the "Frequency of use of pedagogy strategies" scale (see Appendix H, Tables H8-H14). The test resulted in a Cronbach's Alpha score of 0.752, indicating a fairly high rate of consistency among the nine pedagogy strategies. However, the test also indicated that the Cronbach's Alpha score would improve moderately to 0.756 if the item "Ensure student understanding of the specific type of writing task" were removed from the scale. Since the score change would be minimal, I elected to not remove the item from subsequent scale analyses.

The pedagogy scale demonstrated mean scores ranging from 2.23 to 3.80, with a mean of the means of 3.10 and a modal score of 3 (using the identified pedagogical strategies in most assignments). "Ensuring student understanding of the specific type of writing task" seems to be the strategy most often used by respondents, with a mean score significantly higher than all

others. The mean for "Provide feedback to student writing" was significantly higher than all others except "Ensuring student understanding of the specific type of writing task". The strategy "Encourage or provide opportunities for students to utilize multimedia publication of their work product when engaging in synthesis writing" had a mean score significantly lower than all others and seems to be the strategy used least often in respondents' instruction.

Since all respondents would hypothetically provide responses for each of these strategies (which were featured together in the same survey item; see Appendix B, item #8), and since values of 1-4 were assigned to each response choice for each item[31], I was able to construct a scoring scale which could be used to compare the slate of pedagogical-strategy responses to other dependent variables. I then used the scaled scores and criterion coding to conduct a backward regression analysis to determine if any independent variables were significant predictors of respondents' use of the identified pedagogical strategies (using the scaled cumulative score for respondents' answers about all nine strategies; see Appendix H, Tables H15-H24). The analysis indicated that the following four independent variables are the most statistically significant predictors, $F(5, 727) = 12.489$, $p < .001$, $R^2 = .079$.

Table 31

Significant predictors of frequency of use of pedagogical strategies

	Mean	Std. Deviation	N
Synthesis definition	3.1109	.05757	733
School type	3.1072	.07180	733
Years teaching experience	3.1054	.03160	733
ELA course type	3.1024	.06900	733

[31] Originally these response choices were coded 0-3, but because SPSS setting required the use of "0" to indicate missing items, I needed to change the response codes to a 1-4 scale.

These four variables were also indicated as significant predictors of respondents' frequency of instruction on synthesis-writing strategies. According to these data, school setting, the percent of nonwhite students in the ELA course, the percent of low-SES students in the school, the definition of synthesis tasks, and frequency of synthesis writing are not significant predictors of respondents' use of pedagogical strategies that facilitate effective synthesis writing. One-way ANOVAs were then conducted for each of the significant predictors to determine where significant differences lie among the categories of those predictors (see Appendix H, Tables H25-H45). The results of those ANOVAs are as follows:

- **Synthesis definition:** $F(11, 801) = 1.168$, $p = .306$. This analysis indicated that there is no significant difference among the mean scores of categories of definitions of synthesis, suggesting that this variable may not actually be a significant predictor of frequency of instruction on synthesis strategies.
- **School type**: $F(5, 827) = 4.443$, $p = .001$. Tukey's post hoc test indicated that the mean score for parochial schools was significantly lower than the mean score for conventional public schools; no other significant differences were noted among the categories for this variable.
- **Years teaching experience:** $F(6, 827) = .665$, $p = .678$. This analysis indicated that there is no significant difference among the mean scores of categories of years of teaching experience, suggesting that this variable may not actually be a significant predictor of frequency of instruction on synthesis strategies.
- **ELA course type**: $F(8, 865) = 2.535$, $p = .010$. Tukey's post hoc test indicated no significant difference among the mean scores of the different ELA course types,

suggesting that this variable may not actually be a significant predictor of the frequency of respondents' use of the identified pedagogical strategies.

The survey also asked respondents about the format in which they receive students' writing. Up to 880 respondents (72% of total respondents) answered the questions on this topic; their responses are summarized in Table 32. The parenthetical numbers in the column headings are the values assigned to each response for the purpose of determining mean scores for each format category, and the rows are arranged in descending order of mean scores.

Table 32

Frequency of use of formats for receiving student writing

Writing Format	Every assign. (4)	Most assign. (3)	Some assign. (2)	No assign. (1)	Number	Mean	Mode
Printed word-processed documents	116	345	384	35	880	2.62	2
Handwritten	63	224	522	62	871	2.33	2
Electronic documents as e-mail attachments	34	122	430	268	854	1.91	2
Electronic documents posted online	58	133	287	393	871	1.83	1

These data seem to indicate that respondents use a variety of formats for receiving student writing, instead of relying on one primary format. Student use of word-processing software is clearly anticipated by most respondents, but sending electronic documents as e-mail attachments or posting such documents online are used less frequently.

Pedagogy Summary.

The literature review identified nine pedagogical strategies that are conducive to effective synthesis writing:

- Ensure student understanding of the specific type of writing task.

- Provide feedback to student writing Scaffold student learning.
- Provide opportunities for students to review and reflect on their synthesis writing.
- Model synthesis writing.
- Provide opportunities for cooperative/collaborative learning.
- Provide opportunities for peer feedback to student writing.
- Encourage or provide opportunities for students to utilize Web-based information sources when engaging in synthesis writing.
- Encourage or provide opportunities for students to utilize multimedia publication of their work product when engaging in synthesis writing.

Most survey respondents reported that they frequently provide instruction on the strategies described in the first four bullets above, but regression analyses indicated that the only variable that may have significant effects on the frequency with which teachers apply these strategies is school type: respondents from conventional public schools use the identified pedagogical strategies significantly more frequently than do respondents from parochial schools. The survey also indicated that respondents receive students' writing in handwritten or printed word-processed formats more frequently than they receive students' writing in electronic formats.

Research Question 4: What Professional Training Do Teachers Report as Having Had the Most Impact on Their Instruction on Synthesis Writing?

The first survey item pertaining to professional development asked respondents about their awareness of any state course-of-study (COS) standards pertaining to synthesis writing. Only 74% of respondents answered this question; Table 33 presents a summary of their responses.

Table 33

State COS explicitly addresses synthesis writing

Response	Number	%
Yes	504	56%
No	186	21%
Don't know	204	23%
Total	894	100%

A chi-square analysis of these responses by respondents' states, school settings, course types, percent of nonwhite students in the course, and years of teaching experience indicated that those variables are independent (see Appendix I, Tables I1-I5). A chi-square analysis of awareness of COS synthesis requirements by school type, however, did indicate a significant relationship (Pearson Chi Square = 142.886, $p < 0.05$; see Appendix I, Table I6-I8)[32]. Respondents from independent schools reported significantly lower proportions of acknowledging synthesis-writing requirements in the state COS, but they responded that they didn't know about such requirements at a proportionally higher rate than teachers of other school types. This may possibly be due to many independent schools not being subject to state courses of study. Regarding "Yes" responses, teachers from conventional public schools, public charter and magnet schools, and "other" schools responded at similarly high rates. Teachers from conventional public schools and boarding schools had significantly higher proportions of "No" responses.

A chi-square analysis of awareness of state COS synthesis requirements by percent of low-SES students also indicated a dependent relationship between those variables (Pearson Chi Square = 47.954, $p < 0.05$; see Appendix I, Table I9-I11). Respondents from schools whose

[32] Although six cells in this analysis had less than the expected count of five values per cell, the large sample size negated the need for a Fisher's Exact Test.

student populations included 10% or fewer low-SES students reported proportionally fewer "Yes" responses than did respondents from schools with higher percentages of low-SES students; this group also had a significantly higher proportion of "Don't Know" responses. Respondents from schools with 76-100% of students from low-SES households had a significantly higher proportion of "No" responses.

The survey also asked respondents about their awareness of a state COS requirement that specifies the use of source materials to inform a concept original to the student writer and/or for a specific rhetorical purpose. Only 41% of respondents answered this question; Table 34 presents a summary of their responses:

Table 34

State COS requiring synthesis for an original rhetorical purpose

Response	Number	%
Yes	330	66%
No	81	16%
Don't know	88	18%
Total	499	100%

Chi-square analyses of these responses by school setting, school type, percent of low-SES students in the school, course type, percent of nonwhite students in the course, and years of teaching experience did not indicate any dependent relationships among these variables (see Appendix I, Tables I12-I17).

The survey also asked respondents about the number of college courses they took which in some way addressed the teaching of synthesis writing. Seventy-four percent of respondents who started the survey answered this question; a summary of their responses can be found in Table 35.

Table 35

College courses that addressed synthesis writing

Number of courses	Number of responses	Percent
No courses	402	46%
1 course	146	16%
2 courses	100	11%
3 courses	42	5%
4 or more courses	113	13%
Don't know	89	10%
Total	892	100%

As the data indicate, almost half of respondents reported taking no college courses that addressed in any way the teaching of synthesis writing.

I conducted chi-square analyses to determine whether dependent relationships exist between college courses and other variables. Such analyses by years of teaching experience and school type indicated no dependent relationships (see Appendix I, Tables I18 and I19). An analysis of type of ELA course, however, did indicate a dependent relationship (Pearson Chi Square = 57.364, $p < 0.05$)[33]. Z-tests were conducted to determine significant differences in proportions of responses (see Appendix I, Tables I20-I22, and the results of those tests are summarized in Table 36. AP English Language and Composition teachers, whose curriculum explicitly requires that they teach synthesis writing for an original rhetorical purpose, were among those who indicated in proportionally higher numbers that they had no courses that addressed the teaching of synthesis writing. In fact, 51.9% of AP English Language and Composition teachers had this response, a higher percentage than teachers of any other ELA course type.

[33] Although 23 cells in this analysis had less than the expected count of five values per cell, the large sample size negated the need for a Fisher's Exact Test.

Table 36

ELA course type and college courses addressing synthesis writing

Number of courses	Responses
No courses	AP English Language, AP English Literature, and teachers of regular ELA courses had proportionally more responses in this category.
1 course	Teachers of regular ELA courses had proportionally more responses in this category.
2 courses	AP English Literature teachers had proportionally more responses in this category.
3 courses	Responses in this category were similarly low across all ELA course types.
4 or more courses	Teachers of dual credit courses had proportionally more responses in this category
Don't know	Teachers of IB, dual credit, honors, college prep, and "other" ELA courses had similarly high response rates.

Next, the survey asked respondents about professional development (PD) events that were offered to them and, if they attended, how useful those events were for helping respondents teach synthesis writing. Table 37 presents their responses about PD offerings, listed in descending order of affirmative responses. These data indicate that respondents were most aware of PD offerings at their local school and district level.

Table 37

Professional development offerings

PD event	Yes		No		Don't Know		Total
Academic departmental meeting at your school	589	70%	242	26%	14	2%	845
Professional learning group	510	61%	290	35%	40	5%	840
College Board Advanced Placement workshop or summer institute	474	56%	279	33%	86	10%	839
Inservice or workshop at your school	430	51%	381	45%	27	3%	838
School district staff development workshop or inservice	403	48%	382	46%	50	6%	835
Online discussion group	231	28%	464	56%	139	17%	834
College Board/Advanced Placement regional forum	214	26%	414	50%	205	25%	833
Professional organization regional conference	217	26%	436	52%	180	22%	833
Professional organization national conference	213	26%	431	52%	187	23%	831
Advanced Placement Annual Conference	198	24%	435	53%	183	22%	826
English Language Learner professional development event	163	20%	467	56%	202	24%	832

PD event	Yes		No		Don't Know		Total
State educational association conference	148	18%	488	59%	196	24%	832
Dual enrollment/dual credit professional development event	137	16%	473	57%	221	27%	831
International Baccalaureate professional development event	101	12%	482	58%	245	30%	826

Respondents were then asked to indicate the extent to which any of the PD events they attended in the last two years was useful for helping them teach synthesis writing. I conducted a reliability test to determine the internal consistency of the items in the "Usefulness of PD Events" scale (see Appendix I, Tables I23-I28). The test resulted in a Cronbach's Alpha score of 0.752, indicating a fairly high rate of consistency among the nine pedagogy strategies. However, the test also indicated that the Cronbach's Alpha score would improve moderately to 0.763 if the item "College Board Advanced Placement workshop or summer institute" were removed from the scale. Since the score change would be minimal, I elected to not remove the item from subsequent scale analyses. Table 38 presents a summary of those data; the parenthetical numbers in the column headers indicate the values assigned to each, for the purpose of computing the mean score. As with the data regarding respondents' awareness of professional development events, they seem to place the most value on PD opportunities at the local level, rather than regional or national events.

Table 38

Usefulness of PD events

PD event	Didn't attend (1)		Not Useful (2)		Some-what Useful (3)		Useful (4)		Very Useful (5)		Total	Mean
Academic departmental meeting at your school	19	3%	170	28%	182	30%	162	27%	72	12%	605	3.16
Professional learning group	56	10%	98	18%	165	30%	149	27%	84	15%	552	3.19
College Board Advanced Placement workshop or summer institute	195	36%	10	2%	47	9%	101	19%	189	35%	542	3.15
Inservice or workshop at your school	51	11%	151	31%	146	30%	90	19%	43	9%	481	2.84
School district staff development workshop or inservice	70	16%	134	30%	123	27%	82	18%	44	10%	453	2.77
Online discussion group	190	53%	26	7%	62	17%	55	15%	27	8%	360	2.18
Professional organization national conference	248	71%	9	3%	18	5%	45	13%	28	8%	348	1.84
Professional organization regional conference	243	69%	14	4%	35	10%	37	10%	26	7%	355	1.84
English Language Learner professional development event	199	66%	31	10%	26	9%	28	9%	20	7%	304	1.81
Dual enrollment/dual credit professional development event	205	70%	13	5%	28	10%	22	8%	23	8%	291	1.78
College Board/Advanced Placement regional forum	263	74%	7	2%	22	6%	32	9%	32	9%	356	1.77
International Baccalaureate professional development event	221	77%	11	4%	19	7%	18	6%	18	6%	287	1.61
State educational association conference	232	76%	12	4%	26	9%	25	8%	9	3%	304	1.58
Advanced Placement Annual Conference	281	83%	3	1%	8	2%	21	6%	26	8%	339	1.55

The survey also asked respondents to indicate their need or desire for PD on the subject of teaching synthesis writing. Seventy percent of respondents answered this question, and Table 39 presents the summary of their responses.

Table 39

Need/desire for professional development on teaching synthesis writing

		Frequency	Valid Percent
Valid	Unnecessary	30	3.5
	Helpful but not necessary	454	53.2
	Definitely want	370	43.3
	Total	854	100.0
Missing	System	363	
Total		1217	

Only 3.5% of respondents who answered this question indicated that PD on teaching synthesis writing is unnecessary, and over 40% indicated that this is training that they definitely want. I conducted chi-square tests to determine if a dependent relationship exists between respondents' reported need for PD on synthesis writing and the following variables: ELA course type, school type, school, setting, percent of nonwhite students in the ELA course, percent of low-SES students in the school, and years of teaching experience (see Appendix I, Tables I29-I34). Of those, school setting was the only variable to demonstrate such a dependent relationship (Pearson Chi Square = 10.711, $p = .030$). I then conducted z-tests for school setting and need for PD on teaching synthesis writing, and the results indicated that teachers from rural schools responded at proportionally higher rates that such PD would be "Helpful but not necessary" and something they "Definitely want" (see Appendix I, Tables I35 and I36).

Professional Development Summary.

Over half of all respondents indicated that they are aware that their state courses of study address synthesis writing; respondents from independent schools reported being least aware of this requirement, likely because many independent schools are not subject to state course-of-study requirements. Over 60% of respondents reported that their state courses of study require synthesis writing in service of a student's original idea or rhetorical purpose. This seems unusual, because Common Core State Standards are not explicit about this application of synthesis writing, nor are most pre-CCSS state ELA courses of study.

Almost half of all respondents reported taking no college courses that addressed the teaching of synthesis writing; AP English Language, AP English Literature, and teachers of regular ELA courses had proportionally more responses of this type. Teachers of dual-credit courses responded at a proportionally higher rate for taking four or more such college courses.

Regarding types of professional development offerings pertaining to the teaching of synthesis writing, respondents indicate more awareness of such training offered at the local or district level, rather than regional or national events. They also indicated that the training offered at the local or district level was more useful for teaching synthesis writing. An exception was AP English Language and Literature teachers, who rated the training they receive at College Board AP workshops and summer institutes as being highly useful for this purpose.

When asked if training on the teaching of synthesis writing is something they want, less than 4% indicated that they do not need such training; over 40% indicated that it is something they "definitely want." Respondents from rural schools indicated the desire for such training at proportionally higher rates than teachers in other instructional settings.

Research Question 5: Are Different Groups of High School ELA Teachers Characterized by Different Patterns of Responses to the Survey Questions?

I have addressed this research question in my explanations of the various statistical analyses that were conducted for the other research questions, so that all significant independent variables for a given dependent variable could be explained together. What follows here is a summary of the issues for which each of respondents' primary ELA courses was a significant factor. The categories of course types are listed in descending order of the percentage of all respondents that each category represents.

AP English Language and Composition.

Teachers of this course comprised 23% of all respondents. They are less likely than other respondents to have taken a college course that addressed synthesis writing. Compared to respondents who teach other ELA courses, these teachers have fewer classes with more than 25% nonwhite students. They are more likely to define synthesis writing as the creation of an original argument or thesis (due to the explicit curricular requirements of the course) or as a "Prompt response" (most likely due to their familiarity with the format of the synthesis prompt on the AP exam and use of that format in classroom assignments). Their descriptions of synthesis-writing tasks are also more likely to be categorized as "Prompt response." They tend to provide such synthesis-writing opportunities on a monthly basis. These respondents reportedly address key synthesis-writing strategies more frequently than teachers of other ELA courses. Again, this is likely due to the explicit curricular requirements for this course. These respondents are also less likely to scaffold learning or use Web resources for synthesis-writing assignments than respondents who teach other ELA courses. (The infrequent use of Web resources is probably due to most of their synthesis-writing assignments being "Prompt response" tasks,

where the source materials are provided.) Because the minimum sample size was not met for this category of ELA teacher, the results described above may not be broadly applicable to all AP English Language and Composition teachers.

College-preparatory English:

Teachers of this course comprised 19% of all respondents. Like AP English Language and Composition teachers, they also have fewer classes with more than 25% nonwhite students. They are less likely to know whether they had any college courses that addressed synthesis writing. They are more likely to define synthesis writing as the analysis of themes or ideas; however, more frequently their definitions were too general to determine a specific purpose, so they were categorized as "composition support." Their descriptions of synthesis-writing tasks, however, are more often categorized as the analysis of themes or ideas. In those tasks, they are more likely to require students to submit printed word-processed documents.

General curriculum (regular) English:

Teachers of this course comprised 18% of all respondents. They are more likely to have taken one or nor college courses that addressed synthesis writing. They are more likely to define synthesis writing as connecting texts to other topics or, to a lesser extent, as summary. Their descriptions of synthesis-writing tasks, however, are more likely to be categorized as analysis of themes or ideas. These respondents are also less likely to scaffold learning than respondents who teach other courses.

Honors English:

Teachers of this course comprised 17% of all respondents. They are less likely to know if they had any college courses that addressed synthesis writing. They are less likely to teach courses with more than 25% nonwhite students. Their definitions of synthesis writing are more

likely to be categorized as general "composition support" due to lack of details about the purpose of the writing; to a lesser extent, their definitions may also be categorized as "connecting texts to other topics." Their descriptions of synthesis-writing tasks, however, are more likely to be categorized as the creation of an original perspective or analysis. They typically provide opportunities for such tasks two to four times per year. They are more likely to require students to post their writing online as electronic documents.

AP English Literature and Composition:

Teachers of this course comprised nine percent of all respondents. They are more likely to have had two courses or no courses in college that addressed synthesis writing. They are less likely to teach courses with more than 25% nonwhite students. They are more likely to define synthesis writing as literary analysis; their descriptions of synthesis-writing tasks are also more likely to be categorized as literary analysis or, to a lesser extent, literary argument. They are least likely to assign synthesis-writing tasks.

Other English courses:

Teachers of courses in this category (which includes courses such as ELA for special-needs students, pre-AP ELA, journalism, reading, communications, writing, and literature) comprised 5% of all respondents. They are more likely to not know if they had any college courses that addressed synthesis writing. They are also more likely to teach courses with 51-75% nonwhite students. They typically define synthesis writing as rhetorical analysis. The small sample size for this group, however, significantly limits the extent to which generalizations can be made about the population of such teachers.

International Baccalaureate:

Teachers of this course comprised four percent of all respondents. They are less likely to know if they had any college courses that addressed synthesis writing. They are more likely to teach courses with 26-50% nonwhite students. They typically define synthesis writing as literary analysis or, to a lesser extent, rhetorical analysis; their descriptions of synthesis-writing tasks, however, are more likely to be categorized as general "composition support" due to lack of information about the purpose for writing or, to a lesser extent, are categorized as argument. The small sample size for this group, however, significantly limits the extent to which generalizations can be made about the population of such teachers. Because the minimum sample size was not met for this category of ELA teacher, the results described above may not be broadly applicable to all IB English teachers.

English language learners:

Teachers of this course comprised three percent of all respondents. They are more likely to teach courses with more than 50% nonwhite students. Their definitions of synthesis writing are more likely to be categorized as "No synthesis," often due to the use of one text instead of multiple source materials. Their descriptions of synthesis-writing tasks are also more likely to be categorized as "No synthesis" or, to a lesser extent, "analysis of themes or ideas."
They are more likely to require handwritten documents for all of their assignments. The small sample size for this group, however, significantly limits the extent to which generalizations can be made about the population of such teachers.

Dual-credit English:

Teachers of this course comprised two percent of all respondents. They are more likely to have had four or more college courses that addressed synthesis writing or to not know if they had

any such courses. They are less likely to teach courses with more than 25% nonwhite students. They are more likely to define synthesis writing as the creation of an original perspective or analysis or, to a lesser extent, an argument. Their descriptions of synthesis-writing tasks, however, are more likely to be categorized as the creation of an original argument or thesis or, to a lesser extent, a rhetorical analysis. (In any case, all of their definitions and task descriptions address the types of synthesis writing most valued in college-level study. This is not surprising, given that such courses have college curricula and are often taught on college campuses.) They are also more likely to require students to submit printed word-processed documents. The small sample size for this group, however, significantly limits the extent to which generalizations can be made about the population of such teachers. Because the minimum sample size was not met for this category of ELA teacher, the results described above may not be broadly applicable to all dual-credit ELA teachers.

V. Discussion and Implications

Since the number of survey respondents fell short of the goals for statistical significance based on ELA course type (see Table 5), the extent to which any of this study's data can be extrapolated to teachers of AP English Language and Composition, AP English Literature and Composition, IB, or dual-credit ELA courses may be limited. This is unfortunate, because a primary purpose of the study was to gather valid and reliable data about AP English Language and Composition teachers so that comparisons could be made to other ELA teachers, particularly those who teach college-level courses or curricula. If, however, one focuses on the data in this study that is not ELA-course specific, then the sample size is sufficient to make observations about ELA teachers in general.

One such observation is that ELA teachers define synthesis writing in a variety of ways, and many of those definitions may be inconsistent with the types of synthesis writing most valued in higher academic study. Twenty-two percent of respondents (mostly AP English Language and Composition teachers) defined synthesis writing as the creation of an original argument or thesis; 11% (mostly dual-credit teachers) defined it as the creation of an original perspective or analysis, and 9% (again, mostly dual-credit teachers) defined it as an argument. This means that less than half (42%) of respondents defined synthesis writing in a way that aligns with the types of writing most valued in college-level study. Another 20% of respondents provided definitions that were so vague as to the purpose of the writing task that they were simply categorized as "composition support"; still another 13% provided definitions that did not

actually describe the synthesis of materials from multiple sources. One-third of respondents, therefore, may be providing instruction on writing tasks that they are describing as "synthesis" but which may not actually involve synthesis of information from multiple sources or the formation of the student writer's own argument or idea.

Respondents were also asked (after they had provided their own definitions of synthesis writing) which of five provided descriptions of synthesis writing best aligned with their own concepts of that task. Over 80% of respondents selected "Creation of an original theme-focused text" or "Interpretation for a rhetorical purpose", which reflect the types of writing that Flowers et al. (1990) identified as most appropriate for college-level writing. When I coded respondents' own definitions to those five statements, however, only 50% of the definitions they provided aligned to those two statements. This suggests that many teachers may understand or identify with the concept of synthesis writing as applied in advanced academic study, but they may not be able to accurately articulate that concept in their own instruction.

Additionally, respondents were asked to briefly describe a synthesis-writing task that they would assign; almost one third (29.2%) of respondents provided descriptions that were categorized as "Prompt response" (i.e., defining the writing topic and response options and providing a specific set of source materials), which is almost 22% higher than respondents' definitions of synthesis writing that were categorized as "Prompt response." This is may be due to the influence of the AP English Language and Composition Exam, which features a synthesis prompt in which students are provided a topic for writing and a set of 7-10 source materials from which they must draw information to support their argument or thesis. Many of the respondents who teach that course described synthesis tasks in terms of that exam prompt, as did many respondents who teach other ELA courses. This suggests that many teachers may be

conceptualizing synthesis tasks in a way that is narrower than and inconsistent with the ways that such writing is manifested in college-level study, where students may more frequently be required to generate their own research questions or theses and explore source materials themselves. Furthermore, while 13.9% of respondents provided definitions of synthesis writing that were actually categorized as "No Synthesis," 20.4% of respondents' descriptions of synthesis tasks fell into that category. This suggests that some ELA teachers may conceptualize synthesis writing as the use of source materials for a specific purpose, but they may have difficulty articulating that as a task for students.

Almost one-third of respondents (32%) reported providing opportunities for synthesis writing on a monthly basis (mainly AP English Language and Composition teachers), and approximately 40% reported providing such opportunities once or more each week. Respondents whose courses include primarily nonwhite students were more likely to describe synthesis tasks that were categorized as “Prompt response” or “no synthesis.” Respondents from urban schools or with more than 75% nonwhite students in their courses, however, reported a significantly higher rate of offering opportunities for synthesis writing on a daily basis. This suggests that teachers who work with high minority student populations may be more likely to misinterpret or fail to accurately articulate the synthesis task and therefore may be frequently engaging students in writing that does not actually reflect the type of synthesis valued in higher academic study. Such a phenomenon may be attributable to higher teacher turnover in urban schools or schools with higher populations of minority students, which may result in more inexperienced teachers serving in such schools.

The survey data suggest that more teacher training in the application of synthesis tasks may be warranted. The survey data on respondents' desire for such training, however, indicated

that school setting was a more significant factor than percent of nonwhite or low-SES students in the school, as respondents from rural schools indicated a significantly higher demand for such training. Respondents indicated that they were more likely to attend such training and find it useful if it is offered locally, as opposed to opportunities for professional development at regional or national conferences.

Most respondents reported providing frequent instruction on ten key skills or strategies for synthesis writing; "Understand the writing task" was the skill most often taught, and "Read source materials rhetorically" was the skill taught least often (but still taught with almost every synthesis-writing task, according to the respondents). Years of teaching experience was the only demographic factor to significantly predict the frequency of skill instruction: respondents with five years or fewer of teaching experience were less likely to provide such instruction than were teachers with 16-25 or more than 30 years of teaching experience.

The study also identified nine pedagogical strategies that support effective synthesis writing. School type was the only significant demographic predictor of the frequency with which these pedagogical strategies are used: respondents who teach in conventional public schools were most likely to apply the nine pedagogical strategies. Most survey respondents reported that they frequently apply four of these:

- Ensure student understanding of the specific type of writing task.
- Provide feedback to student writing.
- Scaffold student learning.
- Provide opportunities for students to review and reflect on their synthesis writing.

However, the other five pedagogical strategies had frequency scores lower than the lowest frequency score for key synthesis skills ("Read source materials rhetorically"); the least

frequently used pedagogical strategy was "Provide opportunities for students to utilize multimedia publication." Further study is needed to determine whether this is a reflection of student or teacher access to appropriate technology or if this is more a reflection of teachers' familiarity and comfort with such technology. Respondents were much more likely to receive students' compositions as handwritten documents or documents printed from a word processor; they were much less likely receive students' work as e-mail attachments or electronic documents posted online.

As stated previously, the applicability of this study's findings to specific types of ELA courses is limited due to low response rates. The study may, however, still serve as a useful foundation for exploring more deeply the ways that this crucial type of reading and composition is currently addressed in high school classrooms, which hopefully will lead to better teacher preparation for providing effective instruction on synthesis writing. The following are some suggestions for possible next steps for research on this issue:

- Qualitative studies of classroom instruction are needed to better understand how ELA teachers are actually addressing synthesis writing in different school settings. Data should be collected on the ways that teachers articulate synthesis tasks and how students are oriented to synthesis tasks, how key synthesis skills are addressed, the specific pedagogical strategies teachers use, the processes that students use, and the characteristics of their work products.
- A similar survey of targeted populations of teachers of specific types of ELA courses may yield appropriate sample sizes and produce data that confirm or refute the course-specific findings in this survey. Understanding more accurately the ways that teachers of different ELA courses conceptualize and provide instruction on synthesis writing may

lead to the development of instructional resources for use with specific populations of teachers.

- A similar survey of writing instructors in colleges and universities would provide useful information about their perceptions of synthesis writing. Gathering such data from instructors of introductory composition courses would certainly be beneficial, as those courses may be the only writing courses many students experience. But it would also be useful to survey instructors of writing-intensive courses in the disciplines, as well as other departmental faculty, to determine the ways that synthesis writing may be conceptualized and manifested differently in various academic discourse communities.
- Faculty in colleges of education may use this initial study to begin evaluating how synthesis writing is addressed in teacher training. It may be desirable to include information on synthesis writing in specific education courses, but further studies on the ways synthesis writing is manifested in various school settings and among various populations of teachers may lead to projects, possibly in collaboration with local school districts or state departments of education, to develop resources and support for specific groups.

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Appendix A

State English Language Arts Education Standards Addressing Synthesis Writing

For the purposes of this analysis, the desired application of the term "synthesis writing" is defined as gathering information from various sources, identifying a common or unifying information thread across or among the sources, and then using that information in service of one's original rhetorical purpose. A text search was conducted of each state standards document for "synthesize," "synthesizing," or "synthesis;" any use of these terms was noted, regardless of whether it matched the desired application described above. Where no clear reference to these words was found, further searches were conducted for the terms "sources" and/or "argument" to see if the preferred definition of synthesis writing was described in other ways. Searches were limited to standards for high school grade levels. The search results were categorized as follows:

I. The standard references synthesis in the context of using information from various sources in the service of an original rhetorical purpose. (Six states meet this standard.)
II. The standard references synthesis in the context of using information from various sources. (37 states are in this category.)
III. The standard does not reference synthesis in student composition. (Eight states are in this category.)

Table A1

State	Category	How synthesis is addressed	Comments
Alabama	III	No reference to synthesis writing.	
Alaska	III	No reference to synthesis writing.	
Arizona	II	Grade 12: Research writing: Synthesizes information by integrating evidence from various sources in support of a thesis or claim.	No glossary
Arkansas	II	Grade 12: Research/Inquiry process: Synthesizes information by integrating evidence from various sources into a formal research paper.	Glossary does not define "synthesis" or "synthesize"
California	II	Grades 9-10: • Reading comprehension: Synthesize and paraphrase information from various sources. • Writing: Synthesize information from various sources to identify complexities, discrepancies, and perspectives. Grades 11-12: • Write responses to literature using source materials. • Write historical investigation reports using source materials to identify	• Glossary does not define "synthesis" or "synthesize" • "Synthesis" and "synthesize" not used in Grade 11-12 standards

State	Category	How synthesis is addressed	Comments
		similarities and differences in historical records.	
Colorado	I	Grades 9-12: • Analyzing, synthesizing, and evaluating information. • Using information from sources to express one's own thoughts, ideas, and impressions.	These expectations only applicable to "students extending their English/ Language Arts education beyond" the basic standards.
Connecticut	II	• School district's responsibilities, Secondary: Develop students' abilities to question, explore, observe, synthesize and draw conclusions based on their understanding of text. • Communicating, Grades 2-12: Research information from multiple sources for a specific purpose.	"Synthesize": to form by combining parts or elements. (The word is not used in the standards document.)
Delaware	I	• Persuasive writing (Grades 11 and 12): Use information from sources when appropriate; combine information from text with prior knowledge to elaborate ideas. • Informative writing (Grades 11 and 12): Use information from various sources to support generalizations, theses, or ideas. • Oral communication (Grades 9-12): Synthesize and present results of research projects (accurately summarize main ideas). • Reading (Grades 9-12): Connect and synthesize information from various sources to generate ideas or expand knowledge. • Reading (Grades 9-12): Synthesize experience and knowledge to apply judgments about literature and nonfiction. • Reading (Grades 9-10): Synthesize, compare, and contrast diverse interpretations of the same reading. • Grades 9-12: Use technology to synthesize information to express ideas and create texts. • Grades 11-12: Synthesize information as appropriate to a specific purpose.	"Synthesis" in glossary: Demonstrate ability to compile information in a different way by combining concepts or parts in a new pattern or proposing alternative solutions.
District of Columbia	II	Grade 9: • Write interpretations of readings, justified through use of textual evidence. • Write research papers that build an argument with supporting evidence. Grade 10: • Informative texts: Synthesize information from multiple sources to draw conclusions. • Expository writing (research report): Marshal evidence in support of a	"Synthesize" not defined.

State	Category	How synthesis is addressed	Comments
		thesis. Grade 11: Synthesize information from various sources for media presentations. Grade 12 (expository writing): Construct arguments that use relevant evidence.	
Florida	II	Grades 9-12: The student will organize, synthesize, analyze, and evaluate the validity and reliability of information from multiple sources to draw conclusions using a variety of techniques, and correctly use standardized citations.	"Synthesize" not defined.
Georgia	II	• Grade 12, Expository writing: Explain an idea or concept and/or convey information and ideas from primary and secondary sources accurately and coherently • Grades 11 and 12, Research/technology: Synthesizes information from multiple sources and identifies complexities, discrepancies, and different perspectives found in a variety of media. • Grades 9-10, Research/technology: Synthesizes information from multiple sources and identifies complexities and discrepancies in the information and the different perspectives found in each medium.	"Synthesize" not defined.
Hawaii	II	• Understand complex relationships and synthesize and create new ones. • Grades 11 and 12, Writing: Synthesize and cite information from multiple sources.	"Synthesize" not defined.
Idaho	III	No reference to synthesis.	
Illinois	II	• Middle/Junior High School: synthesize new meaning gleaned from multiple sources. • Late High School: synthesize information to support a thesis.	"Synthesize" not defined.
Indiana	II	Grades 9-12, Writing: Synthesizes and evaluates information from a variety of sources and draws conclusions from that information.	"Synthesize" not defined.
Iowa	II	Grades 9-12: • Synthesize information from multiple sources. • Synthesize literary materials. • Synthesize new understandings with background knowledge. • Synthesize information from multiple resources into a brief and focused response.	"Synthesize" not defined.
Kansas	II	Write expository and persuasive texts, using research to meet the reader's needs, draw conclusions, and create an appropriate point of view.	"Synthesize" or "synthesis" not used in the standards.
Kentucky	III	No reference to synthesis	
Louisiana	II	• Grades 9-12: Students locate, select, and synthesize information from a	"Synthesize" not defined.

State	Category	How synthesis is addressed	Comments
		variety of texts, media, references, and technological sources to acquire and communicate knowledge.	
Maine	II	• Grades 5-8: Synthesize data for research topics. • Grades 9-12: Synthesize concepts in informational texts.	"Synthesize" not defined.
Maryland	II	• Reading: Synthesize significant ideas in texts. • Writing: Synthesize information sources to fulfill a self-selected or given purpose.	"Synthesize" not defined.
Massachusetts	II	Grades 11-12: • Research: Gathers information from various sources. • Media production: Synthesize information from various sources.	"Synthesize" not defined.
Michigan	II	Select, interpret, evaluate, and synthesize information from various sources (print and media, primary and secondary)	"Synthesize" not defined.
Minnesota	II	Grade 8: Synthesize information from a variety of sources. Grades 9-12: • Reading: Synthesize information from multiple selections in order to draw conclusions, make predictions, make thematic connections, and form interpretations. • Writing: Organize and synthesize information from a variety of sources and present it in a logical manner.	"Synthesize" not defined.
Mississippi	II	• Grades 9-11 Reading: Analyze or evaluate texts to synthesize responses for summary, précis, explication, etc. • Grades 9-10 Writing: Research a topic comparing and/or contrasting information from a variety of sources to present findings. • Grade 11 Writing: Compose formal persuasive texts, providing evidence as support. • Grade 12 Reading: Analyze or evaluate text to synthesize responses for annotated bibliography. • Grade 12 Writing: Compose formal persuasive texts, providing evidence as support.	"Synthesize" not defined.
Missouri	III	No reference to synthesis	
Montana	II	Reading: Synthesize information within and across texts and draw conclusions. Writing: Use information problem solving process to synthesize information to research a topic.	"Synthesize" not defined.
Nebraska	III	No reference to synthesis	

State	Category	How synthesis is addressed	Comments
Nevada	III	No ELA standards information available	
New Hampshire	II	Grades 8, 10, 12: • Reading (informational texts): Synthesizing and evaluating information within or across text(s) (e.g., constructing appropriate titles; or formulating assertions or controlling ideas) • Reading (research): Support judgments/conclusions with evidence. • Writing: Make a support analytical judgments about a text by drawing a conclusion by synthesizing information (e.g., demonstrate a connection to the broader world of ideas).	"Synthesize" not defined.
New Jersey	II	See Common Core State Standards: • Research: Synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	"Synthesize" not defined.
New Mexico	II	• Reading: o Infer, analyze, and synthesize to increase comprehension. o Synthesize information from a variety of sources (informational, technical, primary and secondary) • Listening/Speaking, Grades 11 and 12: Clarify, elaborate, and synthesize the explicit and implicit meanings of messages. • Research, Grades 11 and 12: o Synthesize a variety of types of visual information. o Synthesize information from multiple research studies to draw conclusions that go beyond those found in any individual study.	"Synthesize" not defined.
New York	II	• Synthesize information from diverse sources and identify complexities and discrepancies in the information. • Compare and synthesize information from different sources.	"Synthesize" not defined.
North Carolina	II	• Analyze, synthesize, and organize information to discover related ideas, concepts, or generalizations. • English III: Critically analyze texts to synthesize ideas. • AP English Language and Composition: o Research and synthesize information. o Synthesize connections between text and historical and cultural context.	"Synthesize" not defined.
North Dakota	II	• Research, Grade 11: Synthesize information in a logical sequence. • Writing: o Grade 10: Defend a personal opinion using facts as support.	"Synthesize" not defined.

State	Category	How synthesis is addressed	Comments
		○ Grade 12: Write persuasive compositions, defending positions with evidence.	
Ohio	II	• Reading: ○ Grades 8-12: Demonstrate comprehension of print and electronic text by responding to questions (e.g., literal, inferential, evaluative and synthesizing). ○ Grades 9-12: Answer literal, inferential, evaluative and synthesizing questions to demonstrate comprehension of grade-appropriate print texts and electronic and visual media. ○ Grades 11-12: Synthesize the content from several sources on a single issue or written by a single author, clarifying ideas and connecting them to other sources and related topics. • Research, Grades 11-12: Synthesize information from multiple sources.	"Synthesize" not defined.
Oklahoma	I	• Reading/Research, Grades 10-12: Synthesize information from multiple sources to draw conclusions that go beyond those found in any of the individual studies. • Visual Literacy, Grades 11 and 12: Use a range of strategies to interpret visual media (e.g., synthesize material viewed)	"Synthesize" not defined.
Oregon	I	• Reading: ○ Synthesize information in various parts of texts to reach supported conclusions. ○ Synthesize the content from several sources or works by a single author dealing with a single issue; paraphrase the ideas and connect them to other sources and related topics to demonstrate comprehension. ○ Extend ideas presented in primary or secondary sources through original analysis, evaluation, and elaboration. • Research writing: Synthesize information from multiple sources and identify complexities and discrepancies in the information and the different perspectives found in each medium.	"Synthesize" not defined.
Pennsylvania	II	• Research, Grades 11-12: Synthesize information gathered from a variety of sources, including technology and one's own research, and evaluate information for its relevance to the research question. • Composition: Analyze, synthesize, and integrate data, creating a reasoned product that supports and appropriately illustrates inference and conclusions drawn from research.	"Synthesize" not defined.

State	Category	How synthesis is addressed	Comments
Rhode Island	I	• Metacognition strategies: After reading, students synthesize. • Reading-Writing connection (Grades 8, 10, 12): Draw a conclusion by synthesizing information (e.g., demonstrate a connection to the broader world of ideas). • Informational writing: o Grades 8, 10, 12: Draw a conclusion by synthesizing information. o Grade 10: Synthesize information from multiple research studies, including primary sources. o Grade 12: Synthesize information from multiple sources to draw conclusions beyond those found in any single source.	"Synthesize" not defined.
South Carolina	III	No reference to synthesis	
South Dakota	II	• Reading: o Grades 9-12: Students can access, analyze, synthesize, and evaluate informational texts. o Grade 12: Synthesize information from multiple sources to analyze issues and to make decisions for research. • Writing: o Grade 9: Write an informational document using primary and secondary sources. o Grade 10: Write a research document that cites sources to support a thesis.	"Synthesize" not defined.
Tennessee	II	English I-IV: • Informational texts: Synthesize information across two or more informational or technical texts. • Research: Write an extended research paper, using primary and secondary sources.	"Synthesize" not defined.
Texas	II	Reading: • English I-IV: Synthesize and make logical connections between ideas and details in several texts selected to reflect a range of viewpoints on the same topic and support those findings with textual evidence. • English II: Synthesize information from multiple graphical sources to draw conclusions about the ideas presented. Research: • English I and II:	"Synthesize" not defined.

State	Category	How synthesis is addressed	Comments
		○ Clarify research questions and evaluate and synthesize collected information. ○ Synthesize the research into a written or an oral presentation that marshals evidence in support of a clear thesis statement and related claims. • English III and IV: Synthesize the research into an extended written or oral presentation that provides an analysis that supports and develops personal opinions, as opposed to simply restating existing information. Writing: • English III and IV: Produce a multimedia presentation that synthesizes information from multiple points of view.	
Utah	II	Reading: • Grade 11: Synthesize information from a variety of sources. Writing: • Grade 10: Write to synthesize information to solve a problem or deepen understanding. • Grade 11: ○ Analyze and synthesize ideas and information to refine thinking through writing. ○ Consolidate and synthesize connections between texts, between texts and self, and between texts and different world connections.	"Synthesize" not defined.
Vermont	II	• Reading: Synthesize and evaluating information within or across text(s) (e.g., constructing appropriate titles; or formulating assertions or controlling ideas). • Writing: ○ Response to literature: Draw a conclusion by synthesizing information. ○ Informational writing: Draw a conclusion by synthesizing information from report and relating it to broader ideas/concepts.	"Synthesize" not defined.
Virginia	II	• Reading, Grade 9: Synthesize information from sources and apply it in written and oral presentations. • Research: ○ Grade 11: Synthesize information in a logical sequence. ○ Grade 12: Synthesize information to support the thesis. • Writing, Grade 11: Develop informative and persuasive compositions by locating, evaluating, synthesizing, and citing applicable information.	"Synthesize" not defined.

State	Category	How synthesis is addressed	Comments
Washington	I	Reading: Oral and written responses analyze and/or synthesize information from multiple sources to deepen understanding of the content. • Grades 9 and 10: ○ Synthesize ideas from selections to make predictions and inferences. ○ Integrate information from multiple sources to draw conclusions that go beyond those found in individual sources. ○ Integrate information from different sources to research and complete a project. ○ Integrate information from different sources to form conclusions about author's assumptions, biases, credibility, cultural and social perspectives, or world views.	"Synthesize" not defined.
West Virginia	II	• Writing: ○ Grade 10: Synthesize into one's writing a variety of informational media using primary and secondary sources. ○ Grades 10-12: Plan and incorporate varied note taking skills to organize and synthesize information from print and electronic sources. • Journalism: Compile, synthesize, produce and disseminate information using technology.	"Synthesize" not defined.
Wisconsin	II	Grade 12: • Analyze and synthesize the concepts and details encountered in informational texts. • Analyze, synthesize, and integrate data, drafting a reasoned report that supports and appropriately illustrates inferences and conclusions drawn from research.	"Synthesize" not defined.
Wyoming	II	• Grade 11: ○ Synthesize relevant data through note-taking and questioning. ○ Students evaluate literary merit and synthesize universal themes across texts. • Webb's depth-of-knowledge, Level 4: ○ Analyze and synthesize information from multiple sources. ○ The standard at this level is a multi-paragraph composition that demonstrates synthesis and analysis of complex ideas or themes.	"Synthesize": To combine in order to create a new idea, form, or product.

The following table indicates the number of statements pertaining to synthesis that were found in each state's ELA standards, disaggregated by grade level and curricular context (i.e., reading, writing, research, or other).

Table A2

Synthesis statements in state ELA standards

State	9th read-ing	9th re-search	9th writ-ing	9th Other	10th read-ing	10th re-search	10th writing	10th Other	11th read-ing	11th re-search	11th writing	11th Other	12th read-ing	12th re-search	12th writing	12th Other	Total
Alabama																	0
Alaska																	0
Arizona														1			1
Arkansas														1			1
California	1		1		1		1				1				1		6
Colorado	1		1		1		1		1		1		1		1		8
Connecticut	1	1			1	1			1	1			1	1			8
Delaware	3	1		1	3	1		1	2	1	1	2	2	1	1	2	22
District of Columbia			2		1	1						1			1		6
Florida	1				1				1				1				4
Georgia		1				1				1				1	1		5
Hawaii				1				1			1	1			1	1	6
Idaho																	0
Illinois	1						1				1				1		4
Indiana			1				1				1				1		4
Iowa	3			1	3			1	3			1	3			1	16
Kansas			1				1				1				1		4
Kentucky																	0
Louisiana	1				1				1				1				4

State	9th read-ing	9th re-search	9th writ-ing	9th Other	10th read-ing	10th re-search	10th writing	10th Other	11th read-ing	11th re-search	11th writing	11th Other	12th read-ing	12th re-search	12th writing	12th Other	Total
Maine	1				1				1				1				4
Maryland	1		1		1		1		1		1		1		1		8
Massachu-setts										1		1		1		1	4
Michigan	1				1				1				1				4
Minnesota	1		1		1		1		1		1		1		1		8
Mississippi	1		1		1		1		1		1		1		1		8
Missouri																	0
Montana	1		1		1		1		1		1		1		1		8
Nebraska																	0
Nevada																	0
New Hampshire					1	1	1						1	1	1		6
New Jersey		1				1				1				1			4
New Mexico	2				2				2	1		1	2	1		1	12
New York	2				2				2				2				8
North Carolina	1				1				2			2	1				7
North Dakota							1			1					1		3
Ohio	2				2				3	1			3	1			12
Oklahoma					1				1			1	1			1	5
Oregon	3	1			3	1			3	1			3	1			16
Pennsylva-nia			1				1			1	1			1	1		6
Rhode Island					1		2	1					1		2	1	8
South Carolina																	0
South Dakota	1		1		1	1			1				1	1			7

State	9th read-ing	9th re-search	9th writ-ing	9th Other	10th read-ing	10th re-search	10th writing	10th Other	11th read-ing	11th re-search	11th writing	11th Other	12th read-ing	12th re-search	12th writing	12th Other	Total
Tennessee	1	1			1	1			1	1			1	1			8
Texas	1	2			2	2			1	1	1		1	1	1		13
Utah							1		1		2						4
Vermont	1		2		1		2		1		2		1		2		12
Virginia	1									1	1			1			4
Washington	3	1			3	1											8
West Virginia							2				1				1	1	5
Wisconsin														1	1		2
Wyoming	0								2								2
TOTAL	36	9	14	3	35	11	14	4	35	13	19	10	33	17	23	9	

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Appendix B

Synthesis-writing Survey

The following survey is being conducted to learn how high school English teachers address the topic of synthesis writing (i.e., writing from source materials) and the means by which they are prepared to do so. While several studies have been conducted about the components of effective synthesis writing, little research has been done on the features of instruction on synthesis writing. Data from this survey will be made available to all survey participants.

[[The statements in brackets below are instructions for the creation of the online survey; the survey participants will not see those statements. Survey items are coded to the research questions for the proposed study: Q1 = question 1, Q2 = question 2, etc.]]

I. Instruction and assessment

1. For the purposes of this survey, please select the type of English course that you view as your **primary** instructional responsibility, and answer the remainder of the questions in this survey with that course in mind. **[[Q5]]**
    - AP English Language and Composition
    - AP English Literature and Composition
    - IB English
    - Dual credit/dual enrollment English course
    - English language learner course
    - Honors English
    - College Preparatory English
    - Regular English course
    - other English course: Please specify _____

2. At what grade level is this course offered? **[[Q5]]**
    - 9th grade
    - 10th grade
    - 11th grade
    - 12th grade
    - Two or more grade levels: please specify _____

3. Please define *synthesis writing* as it applies to the writing that you expect of your students. **[[Q1]]**

    [[Open-ended response; participants will not be able to go back and revise their statements once they have proceeded to the next question.]]

4. Please describe briefly an example of a synthesis task that you would give to your students. **[[Q1]]**

[[Open-ended response; participants will not be able to go back and revise their statements once they have proceeded to the next question.]]

5. Which of the following statements most closely matches your understanding of the definition of *synthesis writing* as it applies to the writing that you expect of your students? **[[Q1]]**
    - Identify key words in paragraphs, summarizes paragraphs, and constructs a composition around the sets of summaries.
    - Use source texts as a starting point for one's own ideas or respond to the topic in general.
    - Add one's own comments to a summary or review of source texts.
    - Identify or create a unifying theme or controlling concept from the source materials, then organize around that concept a text original to the student writer.
    - Use source materials to select and organize information to address a specific audience and create an argument original to the student writer.
    - Other: please specify_____

6. How often do you provide opportunities for students to engage in synthesis writing? **[[Q2]]**
    - Daily
    - Weekly
    - Monthly
    - Once each quarter
    - Once each semester
    - Once each year
    - Not at all

7. Please indicate approximately how often you provide instruction on the following synthesis writing skills, using this scale for each: **[[Q2, Q3]]**

        3 - For every synthesis-writing assignment
        2 - For most synthesis-writing assignments
        1 - For some synthesis-writing assignments
        0 - For no synthesis-writing assignments

    - Understanding the discourse expectations of the academic discipline
    - Understanding the rhetorical context of the writing task
    - Selecting appropriate source materials, based on the context of the writing task
    - Reading source materials rhetorically
    - Integrating information from various source materials
    - Balancing information from source materials with prior knowledge
    - Considering the audience for the writing
    - Understanding the type of writing task (e.g., expository, argumentative)
    - Understanding organizational structures for argumentative synthesis writing and expository writing?
    - Integrating source materials into a student-generated analysis, argument, or interpretation with a specific rhetorical purpose

8. Please indicate the extent to which you address the following in your writing instruction, using this scale for each: **[[Q2, Q3]]**

    3 - For every synthesis-writing assignment
    2 - For most synthesis-writing assignments
    1 - For some synthesis-writing assignments
    0 - For no synthesis-writing assignments

    - Ensure student understanding of the specific type of writing task
    - Model synthesis writing
    - Scaffold student learning
    - Provide opportunities for cooperative/collaborative learning
    - Provide feedback to student writing
    - Provide opportunities for peer feedback to student writing
    - Encourage or provide opportunities for students to utilize Web-based information sources when engaging in synthesis writing
    - Encourage or provide opportunities for students to utilize multimedia publication of their work product when engaging in synthesis writing
    - Provide opportunities for students to review and reflect on their synthesis writing

9. Which of the following best describes the writing process approach that you instruct your students to use? **[[Q3]]**
    - Linear (i.e., read, take notes, reread, take additional notes, outline, write, revise)
    - Nonlinear (i.e., students apply writing-process stages repeatedly and in variable order as needed)
    - Other: please specify_____

10. Please indicate the extent to which students use the following methods to submit their writing to you, using this scale for each: **[[Q3]]**

    3 - For every writing assignment
    2 - For most writing assignments
    1 - For some writing assignments
    0 - For no writing assignments

    - Handwritten
    - Printed word-processed documents
    - Electronic documents as e-mail attachments
    - Electronic documents posted online
    - Other: please specify_____

II. Professional Development

11. In your college studies (undergraduate and graduate), how many courses did you have that included at least SOME instruction about teaching students to synthesize information from multiple sources for a concept original to the student writer or for a specific rhetorical purpose? **[[Q4]]**

    - 0
    - 1 course
    - 2 courses
    - 3 courses
    - 4 or more courses
    - Do not know

12. Do the state curricular requirements for your course explicitly address synthesis writing? **[[Q4]]**
    - Yes
    - No
    - Do not know

    [[If the answer is yes, go to Question 14.
    If the answer is no, go to Question 15.]]

13. Does the state curriculum requirement regarding synthesis writing refer to the use of source materials to inform a concept original to the student writer or for a specific rhetorical purpose? **[[Q4]]**
    - Yes
    - No
    - Do not know

14. For each of the following PD forums, please indicate whether it was offered to you in the past two years and, if you attended, how useful it was in helping you teach students to synthesize source materials to serve students' own ideas or rhetorical purposes.

    - Academic departmental meeting at your school
    - Professional learning group
    - Inservice or workshop at your school
    - School district staff development workshop or inservice
    - Online discussion group
    - State educational association conference
    - Professional organization regional conference
    - Dual enrollment/dual credit professional development event
    - English Language Learner professional development event

- College Board/Advanced Placement regional forum
- Professional organization national conference
- Advanced Placement Annual Conferenc
- International Baccalaureate professional development event
- Other learning opportunities (please specify)

[Will use Likert scale, with "1" indicating "Not at all useful" and "5" indicating "Very useful.]

15. To what extent would you say that you need professional development specifically on the subject of teaching students to synthesize information from source materials to serve the students' own ideas or rhetorical purposes? **[[Q4]]**
    - Definite need
    - Possible need
    - Beneficial to have but not a need
    - Completely unnecessary

III. **Background** [[Since we are not requiring survey participants to identify themselves or their schools, we have to ask that they provide this demographic information; otherwise, we won't have any way to link survey participants to specific school types or settings.]]

16. How many years of teaching experience do you have? Please indicate the number of years only (round to the nearest whole year). **[[Q5]]**

17. How many years have you been teaching in your current primary instructional position (identified in your response to Question 1 in this survey)? Please indicate the number of years only (round to the nearest whole year). **[[Q5]]**
18. In what setting do you teach? **[[Q5]]**
    - Urban
    - Suburban
    - Rural
    - Online

19. What is the approximate number of students in the high school in which you teach? **[[Q5]]**
    - 500 students or fewer
    - 501 - 1000 students
    - 1001 - 1500 students
    - 1501 - 2000 students
    - More than 2,000 students

20. Which of the following best describes the high school in which you teach? **[[Q5]]**
    - Conventional public school
    - Private
    - Parochial
    - Charter

- Magnet
- Online
- Other

21. Approximately what percentage of the students in your class(es) belong to a nonwhite/non-Caucasian ethnic or racial group? **[[Q5]]**
    - 0-10%
    - 11-25%
    - 26-50%
    - 51-75%
    - 76-100%

22. Approximately what percentage of the students in your school belong to a nonwhite/non-Caucasian ethnic or racial group? **[[Q5]]**
    - 0-10%
    - 11-25%
    - 26-50%
    - 51-75%
    - 76-100%

23. Approximately what percentage of students in your school come from low income homes (e.g., qualify for free or reduced-price lunch)? **[[Q5]]**
    - 0-10%
    - 11-25%
    - 26-50%
    - 51-75%
    - 76-100%

24. In what U.S. state do you teach? [[Survey form will list all 50 states and the District of Columbia.]] **[[Q5]]**

25. What is the highest academic degree that you have completed? **[[Q5]]**
    - Bachelor's degree
    - Master's degree
    - Specialist degree
    - Doctorate

NOTE: If you are willing to name your school, please do so. This information will only be used for data analysis, and no school names or any other identifying information will appear in the final survey report.

School name: _____

City: _____

State: _____

Appendix C

Demographic Data

School type and low-SES percent

Table C1

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Low SES % in school * Type of school	842	69.2%	375	30.8%	1217	100.0%

Table C2

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	134.722[a]	15	.000
Likelihood Ratio	161.164	15	.000
Linear-by-Linear Association	86.620	1	.000
N of Valid Cases	842		

a. 8 cells (33.3%) have expected count less than 5. The minimum expected count is 1.45.

Table C3

			Conventional public	Public charter	Public magnet	Independent	Parochial	Boarding/other	Total
Low SES % in school	0-25%	Count	262_{a}	6_{a}	$17_{a, b}$	$77_{c, d}$	69_{d}	$15_{b, c}$	446
		% within Low SES % in school	58.7%	1.3%	3.8%	17.3%	15.5%	3.4%	100.0%
		% within Type of school	42.9%	30.0%	53.1%	90.6%	93.2%	75.0%	53.0%
	26-50%	Count	$176_{a, b}$	9_{b}	$8_{a, b}$	6_{c}	4_{c}	$3_{a, c}$	206
		% within Low SES % in school	85.4%	4.4%	3.9%	2.9%	1.9%	1.5%	100.0%
		% within Type of school	28.8%	45.0%	25.0%	7.1%	5.4%	15.0%	24.5%
	51-75%	Count	120_{a}	$2_{a, b}$	5_{a}	0_{c}	$1_{b, c}$	$1_{a, b}$	129
		% within Low SES % in school	93.0%	1.6%	3.9%	0.0%	0.8%	0.8%	100.0%
		% within Type of school	19.6%	10.0%	15.6%	0.0%	1.4%	5.0%	15.3%
	76-100%	Count	53_{a}	3_{a}	$2_{a, b}$	$2_{b, c}$	0_{c}	$1_{a, b, c}$	61
		% within Low SES % in school	86.9%	4.9%	3.3%	3.3%	0.0%	1.6%	100.0%
		% within Type of school	8.7%	15.0%	6.3%	2.4%	0.0%	5.0%	7.2%
Total		Count	611	20	32	85	74	20	842
		% within Low SES % in school	72.6%	2.4%	3.8%	10.1%	8.8%	2.4%	100.0%
		% within Type of school	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Type of school categories whose column proportions do not differ significantly from each other at the .05 level.

% Nonwhite students in ELA course and in school

Table C4

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Nonwhite % in school * % nonwhite in course	838	68.9%	379	31.1%	1217	100.0%

Table C5

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1362.641[a]	9	.000
Likelihood Ratio	1000.081	9	.000
Linear-by-Linear Association	577.356	1	.000
N of Valid Cases	838		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.30.

Table C6

			% nonwhite in course				Total
			0-25%	26-50%	51-75%	76-100%	
Nonwhite % in school	0-25%	Count	447_a	4_b	$7_{b,c}$	10_c	468
		% within Nonwhite % in school	95.5%	0.9%	1.5%	2.1%	100.0%
		% within % nonwhite in course	87.0%	3.0%	7.1%	11.1%	55.8%
	26-50%	Count	59_a	109_b	10_a	6_a	184
		% within Nonwhite % in school	32.1%	59.2%	5.4%	3.3%	100.0%
		% within % nonwhite in course	11.5%	80.7%	10.1%	6.7%	22.0%
	51-75%	Count	6_a	21_b	81_c	10_b	118
		% within Nonwhite % in school	5.1%	17.8%	68.6%	8.5%	100.0%
		% within % nonwhite in course	1.2%	15.6%	81.8%	11.1%	14.1%
	76-100%	Count	2_a	1_a	1_a	64_b	68
		% within Nonwhite % in school	2.9%	1.5%	1.5%	94.1%	100.0%
		% within % nonwhite in course	0.4%	0.7%	1.0%	71.1%	8.1%
Total		Count	514	135	99	90	838
		% within Nonwhite % in school	61.3%	16.1%	11.8%	10.7%	100.0%
		% within % nonwhite in course	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of % nonwhite in course categories whose column proportions do not differ significantly from each other at the .05 level.

% Nonwhite students in ELA course and school setting

Table C7

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Instructional setting * Nonwhite % in course	853	70.1%	364	29.9%	1217	100.0%

Table C8

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	74.347[a]	8	.000
Likelihood Ratio	70.665	8	.000
Linear-by-Linear Association	59.256	1	.000
N of Valid Cases	853		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.86.

Table C9

			Instructional setting			Total
			Urban	Suburban	Rural	
Nonwhite % in course	0-10%	Count	38_a	214_b	59_c	311
		% within Nonwhite % in course	12.2%	68.8%	19.0%	100.0%
		% within Instructional setting	20.2%	38.6%	53.6%	36.5%
	11-25%	Count	35_a	157_b	21_a	213
		% within Nonwhite % in course	16.4%	73.7%	9.9%	100.0%
		% within Instructional setting	18.6%	28.3%	19.1%	25.0%
	26-50%	Count	36_a	84_a	16_a	136
		% within Nonwhite % in course	26.5%	61.8%	11.8%	100.0%
		% within Instructional setting	19.1%	15.1%	14.5%	15.9%
	51-75%	Count	38_a	55_b	8_b	101
		% within Nonwhite % in course	37.6%	54.5%	7.9%	100.0%
		% within Instructional setting	20.2%	9.9%	7.3%	11.8%
	76-100%	Count	41_a	45_b	6_b	92
		% within Nonwhite % in course	44.6%	48.9%	6.5%	100.0%
		% within Instructional setting	21.8%	8.1%	5.5%	10.8%
Total		Count	188	555	110	853
		% within Nonwhite % in course	22.0%	65.1%	12.9%	100.0%
		% within Instructional setting	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Instructional setting categories whose column proportions do not differ significantly from each other at the .05 level.

% Nonwhite students in ELA course and school type

Table C10

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
% nonwhite in course * Type of school	854	70.2%	363	29.8%	1217	100.0%

Table C11

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.323[a]	15	.000
Likelihood Ratio	42.916	15	.000
Linear-by-Linear Association	10.451	1	.001
N of Valid Cases	854		

a. 8 cells (33.3%) have expected count less than 5. The minimum expected count is 2.15.

Table C12

			Type of school						Total
			Conventional public	Public charter	Public magnet	Independent	Parochial	Boarding/ other	
% nonwhite in course	0-25%	Count	362_{a}	8_{a}	14_{a}	$67_{b, c}$	63_{c}	$11_{a, b}$	525
		% within % nonwhite in course	69.0%	1.5%	2.7%	12.8%	12.0%	2.1%	100.0%
		% within Type of school	58.7%	40.0%	43.8%	76.1%	81.8%	55.0%	61.5%
	26-50%	Count	$109_{a, b}$	$4_{a, b}$	9_{b}	5_{c}	$7_{a, c}$	$3_{a, b, c}$	137
		% within % nonwhite in course	79.6%	2.9%	6.6%	3.6%	5.1%	2.2%	100.0%
		% within Type of school	17.7%	20.0%	28.1%	5.7%	9.1%	15.0%	16.0%
	51-75%	Count	$72_{a, b, c}$	5_{c}	$5_{a, b, c}$	8_{b}	5_{b}	$5_{a, c}$	100
		% within % nonwhite in course	72.0%	5.0%	5.0%	8.0%	5.0%	5.0%	100.0%
		% within Type of school	11.7%	25.0%	15.6%	9.1%	6.5%	25.0%	11.7%
	76-100%	Count	74_{a}	3_{a}	4_{a}	$8_{a, b}$	2_{b}	$1_{a, b}$	92
		% within % nonwhite in course	80.4%	3.3%	4.3%	8.7%	2.2%	1.1%	100.0%
		% within Type of school	12.0%	15.0%	12.5%	9.1%	2.6%	5.0%	10.8%
Total		Count	617	20	32	88	77	20	854
		% within % nonwhite in course	72.2%	2.3%	3.7%	10.3%	9.0%	2.3%	100.0%
		% within Type of school	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Type of school categories whose column proportions do not differ significantly from each other at the .05 level.

% Nonwhite students in ELA course and ELA course type

Table C13

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
% nonwhite in course * Type of course	851	69.9%	366	30.1%	1217	100.0%

Table C14

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	131.858[a]	24	.000
Likelihood Ratio	103.964	24	.000
Linear-by-Linear Association	10.582	1	.001
N of Valid Cases	851		

a. 11 cells (30.6%) have expected count less than 5. The minimum expected count is 2.27.

Table C15

			Type of course									Total
			AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	
% nonwhite in course	0-25%	Count	$156_{a, b}$	$55_{a, b}$	$16_{c, d}$	20_{b}	1_{e}	$90_{a, d}$	86_{d}	$90_{a, d}$	9_{c}	523
		% within % nonwhite in course	29.8%	10.5%	3.1%	3.8%	0.2%	17.2%	16.4%	17.2%	1.7%	100.0%
		% within Type of course	69.3%	71.4%	47.1%	87.0%	4.8%	63.8%	54.4%	62.5%	32.1%	61.5%
	26-50%	Count	$32_{a, b}$	7_{b}	11_{c}	$2_{a, b, d}$	0_{b}	$19_{a, b, d}$	$35_{c, d}$	$22_{a, b, d}$	$7_{a, c, d}$	135
		% within % nonwhite in course	23.7%	5.2%	8.1%	1.5%	0.0%	14.1%	25.9%	16.3%	5.2%	100.0%
		% within Type of course	14.2%	9.1%	32.4%	8.7%	0.0%	13.5%	22.2%	15.3%	25.0%	15.9%
	51-75%	Count	20_{a}	$10_{a, b}$	$5_{a, b}$	0_{a}	5_{b}	$19_{a, b}$	$18_{a, b}$	$18_{a, b}$	6_{b}	101
		% within % nonwhite in course	19.8%	9.9%	5.0%	0.0%	5.0%	18.8%	17.8%	17.8%	5.9%	100.0%
		% within Type of course	8.9%	13.0%	14.7%	0.0%	23.8%	13.5%	11.4%	12.5%	21.4%	11.9%
	76-100%	Count	17_{a}	5_{a}	$2_{a, b}$	$1_{a, b}$	15_{c}	$13_{a, b}$	$19_{a, b}$	$14_{a, b}$	6_{b}	92
		% within % nonwhite in course	18.5%	5.4%	2.2%	1.1%	16.3%	14.1%	20.7%	15.2%	6.5%	100.0%
		% within Type of course	7.6%	6.5%	5.9%	4.3%	71.4%	9.2%	12.0%	9.7%	21.4%	10.8%
Total		Count	225	77	34	23	21	141	158	144	28	851
		% within % nonwhite in course	26.4%	9.0%	4.0%	2.7%	2.5%	16.6%	18.6%	16.9%	3.3%	100.0%
		% within Type of course	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Type of course categories whose column proportions do not differ significantly from each other at the .05 level.

Appendix D

Respondents' synthesis definitions

Synthesis definitions and ELA course type

Table D1

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Teacher's synthesis definition * Type of course	959	78.8%	258	21.2%	1217	100.0%

Table D2

		AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	Total
Prompt response	Count	31_{a}	$5_{a, b}$	$2_{a, b}$	$0_{a, b}$	$1_{a, b}$	9_{b}	$16_{a, b}$	7_{b}	$1_{a, b}$	72
	% within Type of course	12.5%	5.7%	5.3%	0.0%	3.8%	5.9%	8.6%	4.4%	2.6%	7.5%
Original argument/thesis	Count	95_{a}	10_{b}	4_{b}	2_{b}	4_{b}	32_{b}	34_{b}	27_{b}	5_{b}	213
	% within Type of course	38.3%	11.4%	10.5%	9.5%	15.4%	20.9%	18.2%	17.0%	12.8%	22.2%
Original perspective/analysis	Count	$21_{a, b}$	$9_{a, b}$	1_{b}	4_{a}	$2_{a, b}$	22_{a}	$21_{a, b}$	23_{a}	7_{a}	110
	% within Type of course	8.5%	10.2%	2.6%	19.0%	7.7%	14.4%	11.2%	14.5%	17.9%	11.5%
Connecting to texts/topics	Count	8_{a}	$3_{a, b}$	$1_{a, b}$	$0_{a, b}$	$0_{a, b}$	12_{b}	$10_{a, b}$	13_{b}	$3_{a, b}$	50
	% within Type of course	3.2%	3.4%	2.6%	0.0%	0.0%	7.8%	5.3%	8.2%	7.7%	5.2%

		AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	Total
Summary	Count	2_{a}	$3_{a, b}$	$1_{a, b}$	$1_{a, b}$	$0_{a, b}$	$3_{a, b}$	$4_{a, b}$	6_{b}	$1_{a, b}$	21
	% within Type of course	0.8%	3.4%	2.6%	4.8%	0.0%	2.0%	2.1%	3.8%	2.6%	2.2%
Analysis of themes/ideas	Count	4_{a}	$4_{a, b}$	$2_{a, b}$	$0_{a, b}$	$0_{a, b}$	$6_{a, b}$	11_{b}	$5_{a, b}$	$2_{a, b}$	34
	% within Type of course	1.6%	4.5%	5.3%	0.0%	0.0%	3.9%	5.9%	3.1%	5.1%	3.5%
Literary analysis	Count	4_{a}	10_{b}	5_{b}	$1_{a, b}$	$0_{a, b}$	3_{a}	4_{a}	2_{a}	$1_{a, b}$	30
	% within Type of course	1.6%	11.4%	13.2%	4.8%	0.0%	2.0%	2.1%	1.3%	2.6%	3.1%
Literary argument	Count	0_{a}	1_{a}	0_{a}	0_{a}	0_{a}	1_{a}	0_{a}	1_{a}	0_{a}	3
	% within Type of course	0.0%	1.1%	0.0%	0.0%	0.0%	0.7%	0.0%	0.6%	0.0%	0.3%
Composition support	Count	38_{a}	$19_{a, b}$	$9_{a, b}$	$3_{a, b}$	$4_{a, b}$	39_{b}	48_{b}	$35_{a, b}$	$6_{a, b}$	201
	% within Type of course	15.3%	21.6%	23.7%	14.3%	15.4%	25.5%	25.7%	22.0%	15.4%	21.0%
No synthesis	Count	17_{a}	$12_{a, b, c, d}$	$10_{d, e}$	$7_{e, f}$	15_{f}	$13_{a, c}$	$24_{b, c}$	$25_{b, c, d}$	$8_{b, d, e}$	131
	% within Type of course	6.9%	13.6%	26.3%	33.3%	57.7%	8.5%	12.8%	15.7%	20.5%	13.7%
Rhetorical analysis	Count	$2_{a, b, c}$	$1_{a, b, c}$	1_{c}	$0_{a, b, c}$	$0_{a, b, c}$	0_{b}	0_{b}	0_{b}	$1_{a, c}$	5
	% within Type of course	0.8%	1.1%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	0.5%
Argument	Count	$26_{a, b}$	$11_{a, b}$	$2_{a, b}$	3_{b}	0_{a}	$13_{a, b}$	$15_{a, b}$	$15_{a, b}$	$4_{a, b}$	89
	% within Type of course	10.5%	12.5%	5.3%	14.3%	0.0%	8.5%	8.0%	9.4%	10.3%	9.3%
Total	Count	248	88	38	21	26	153	187	159	39	959
	% within Type of course	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Type of course categories whose column proportions do not differ significantly from each other at the .05 level.

Table D3

Synthesis definitions and years of experience

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	80.086[a]	66	.114
Likelihood Ratio	86.611	66	.045
Linear-by-Linear Association	.432	1	.511
N of Valid Cases	795		

a. 36 cells (42.9%) have expected count less than 5. The minimum expected count is .27.

Table D4

Synthesis definitions and school setting

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.919[a]	22	.768
Likelihood Ratio	18.067	22	.702
Linear-by-Linear Association	1.039	1	.308
N of Valid Cases	793		

a. 11 cells (30.6%) have expected count less than 5. The minimum expected count is .37.

Table D5

Synthesis definitions and school type

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	79.719[a]	66	.120
Likelihood Ratio	65.892	66	.481
Linear-by-Linear Association	1.012	1	.314
N of Valid Cases	793		

a. 60 cells (71.4%) have expected count less than 5. The minimum expected count is .03.

Table D6

Synthesis definitions and % nonwhite students in ELA course

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	59.562[a]	44	.059
Likelihood Ratio	61.315	44	.043
Linear-by-Linear Association	.399	1	.527
N of Valid Cases	792		

a. 22 cells (36.7%) have expected count less than 5. The minimum expected count is .33.

Table D7

Synthesis definitions by % low-SES students in school

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.146[a]	44	.758
Likelihood Ratio	40.020	44	.643
Linear-by-Linear Association	.026	1	.873
N of Valid Cases	782		

a. 20 cells (33.3%) have expected count less than 5. The minimum expected count is .22.

Appendix E

Descriptions of synthesis-writing tasks

Descriptions of synthesis-writing tasks and ELA course type

Table E1

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Teacher's task example * Type of course	890	73.1%	327	26.9%	1217	100.0%

Table E2

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	168.558[a]	88	.000
Likelihood Ratio	171.425	88	.000
Linear-by-Linear Association	23.732	1	.000
N of Valid Cases	890		

a. 63 cells (58.3%) have expected count less than 5. The minimum expected count is .25.

Table E3

			Type of course									Total
			AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	
Teacher's task example	Prompt response	Count	103_{a}	22_{b}	4_{c}	$2_{b, c}$	1_{c}	38_{b}	$43_{b, c}$	38_{b}	$9_{b, c}$	260
		% within Teacher's task example	39.6%	8.5%	1.5%	0.8%	0.4%	14.6%	16.5%	14.6%	3.5%	100.0%
		% within Type of course	43.6%	28.6%	10.8%	10.0%	5.0%	26.8%	24.2%	26.2%	25.7%	29.2%
	Original argument/thesis	Count	$47_{a, b}$	7_{c}	$3_{b, c}$	6_{a}	$2_{a, b, c}$	16_{c}	$27_{a, b, c}$	13_{c}	2_{c}	123
		% within Teacher's task example	38.2%	5.7%	2.4%	4.9%	1.6%	13.0%	22.0%	10.6%	1.6%	100.0%
		% within Type of course	19.9%	9.1%	8.1%	30.0%	10.0%	11.3%	15.2%	9.0%	5.7%	13.8%
	Original perspective/analysis	Count	$10_{a, b}$	1_{b}	$1_{a, b}$	$0_{a, b}$	$0_{a, b}$	11_{a}	$10_{a, b}$	$9_{a, b}$	$3_{a, b}$	45
		% within Teacher's task example	22.2%	2.2%	2.2%	0.0%	0.0%	24.4%	22.2%	20.0%	6.7%	100.0%
		% within Type of course	4.2%	1.3%	2.7%	0.0%	0.0%	7.7%	5.6%	6.2%	8.6%	5.1%
	Connecting to texts/topics	Count	11_{a}	4_{a}	1_{a}	0_{a}	1_{a}	8_{a}	8_{a}	9_{a}	2_{a}	44
		% within Teacher's task example	25.0%	9.1%	2.3%	0.0%	2.3%	18.2%	18.2%	20.5%	4.5%	100.0%
		% within Type of course	4.7%	5.2%	2.7%	0.0%	5.0%	5.6%	4.5%	6.2%	5.7%	4.9%
	Summary	Count	7_{a}	2_{a}	1_{a}	1_{a}	0_{a}	5_{a}	2_{a}	3_{a}	2_{a}	23
		% within Teacher's task example	30.4%	8.7%	4.3%	4.3%	0.0%	21.7%	8.7%	13.0%	8.7%	100.0%

			Type of course									Total
			AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	
		% within Type of course	3.0%	2.6%	2.7%	5.0%	0.0%	3.5%	1.1%	2.1%	5.7%	2.6%
	Analysis of themes/ideas	Count	5_{a}	$2_{a, b}$	$1_{a, b}$	$1_{a, b}$	2_{b}	$7_{a, b}$	11_{b}	9_{b}	$1_{a, b}$	39
		% within Teacher's task example	12.8%	5.1%	2.6%	2.6%	5.1%	17.9%	28.2%	23.1%	2.6%	100.0%
		% within Type of course	2.1%	2.6%	2.7%	5.0%	10.0%	4.9%	6.2%	6.2%	2.9%	4.4%
	Literary analysis	Count	6_{a}	13_{b}	$4_{b, c}$	$1_{a, b, c}$	$1_{a, b, c}$	10_{c}	12_{c}	$6_{a, c}$	$1_{a, c}$	54
		% within Teacher's task example	11.1%	24.1%	7.4%	1.9%	1.9%	18.5%	22.2%	11.1%	1.9%	100.0%
		% within Type of course	2.5%	16.9%	10.8%	5.0%	5.0%	7.0%	6.7%	4.1%	2.9%	6.1%
	Literary argument	Count	$4_{a, b}$	3_{b}	$0_{a, b}$	$1_{a, b}$	$0_{a, b}$	$4_{a, b}$	1_{a}	$1_{a, b}$	$0_{a, b}$	14
		% within Teacher's task example	28.6%	21.4%	0.0%	7.1%	0.0%	28.6%	7.1%	7.1%	0.0%	100.0%
		% within Type of course	1.7%	3.9%	0.0%	5.0%	0.0%	2.8%	0.6%	0.7%	0.0%	1.6%
	Composition support	Count	13_{a}	6_{a}	8_{b}	$1_{a, b}$	$2_{a, b}$	10_{a}	15_{a}	$15_{a, b}$	$2_{a, b}$	72
		% within Teacher's task example	18.1%	8.3%	11.1%	1.4%	2.8%	13.9%	20.8%	20.8%	2.8%	100.0%
		% within Type of course	5.5%	7.8%	21.6%	5.0%	10.0%	7.0%	8.4%	10.3%	5.7%	8.1%
	No synthesis	Count	19_{a}	16_{b}	$11_{b, c}$	$7_{b, c}$	11_{c}	27_{b}	41_{b}	39_{b}	$10_{b, c}$	181
		% within Teacher's task example	10.5%	8.8%	6.1%	3.9%	6.1%	14.9%	22.7%	21.5%	5.5%	100.0%

			Type of course									Total
			AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	
		% within Type of course	8.1%	20.8%	29.7%	35.0%	55.0%	19.0%	23.0%	26.9%	28.6%	20.3%
	Rhetorical analysis	Count	$4_{a, b, c, d}$	$0_{b, d}$	$1_{c, d}$	$0_{a, b, c, d}$	$0_{a, b, c, d}$	0_{b}	$2_{a, b, c, d}$	$2_{a, b, c, d}$	$2_{a, c}$	11
		% within Teacher's task example	36.4%	0.0%	9.1%	0.0%	0.0%	0.0%	18.2%	18.2%	18.2%	100.0%
		% within Type of course	1.7%	0.0%	2.7%	0.0%	0.0%	0.0%	1.1%	1.4%	5.7%	1.2%
	Argument	Count	$7_{a, b}$	$1_{a, b}$	2_{b}	$0_{a, b}$	$0_{a, b}$	$6_{a, b}$	$6_{a, b}$	1_{a}	$1_{a, b}$	24
		% within Teacher's task example	29.2%	4.2%	8.3%	0.0%	0.0%	25.0%	25.0%	4.2%	4.2%	100.0%
		% within Type of course	3.0%	1.3%	5.4%	0.0%	0.0%	4.2%	3.4%	0.7%	2.9%	2.7%
Total		Count	236	77	37	20	20	142	178	145	35	890
		% within Teacher's task example	26.5%	8.7%	4.2%	2.2%	2.2%	16.0%	20.0%	16.3%	3.9%	100.0%
		% within Type of course	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Type of course categories whose column proportions do not differ significantly from each other at the .05 level.

Table E4

Descriptions of synthesis-writing tasks and years of teaching experience

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	68.258[a]	66	.400
Likelihood Ratio	77.509	66	.157
Linear-by-Linear Association	1.725	1	.189
N of Valid Cases	771		

a. 41 cells (48.8%) have expected count less than 5. The minimum expected count is .89.

Table E5

Descriptions of synthesis-writing tasks and % low-SES students in school

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	45.204[a]	44	.421
Likelihood Ratio	50.464	44	.233
Linear-by-Linear Association	3.183	1	.074
N of Valid Cases	758		

a. 21 cells (35.0%) have expected count less than 5. The minimum expected count is .71.

Table E6

Descriptions of synthesis-writing tasks and school type

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	72.054[a]	66	.285
Likelihood Ratio	85.578	66	.053
Linear-by-Linear Association	.360	1	.548
N of Valid Cases	769		

a. 61 cells (72.6%) have expected count less than 5. The minimum expected count is .12.

Table E7

Descriptions of synthesis-writing tasks and school setting

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.376[a]	22	.236
Likelihood Ratio	25.774	22	.261
Linear-by-Linear Association	.007	1	.934
N of Valid Cases	769		

a. 11 cells (30.6%) have expected count less than 5. The minimum expected count is 1.22.

Descriptions of synthesis-writing tasks and % nonwhite students in ELA course

Table E8

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Nonwhite % in course * Teacher's task example	768	63.1%	449	36.9%	1217	100.0%

Table E9

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.724[a]	33	.025
Likelihood Ratio	50.721	33	.025
Linear-by-Linear Association	2.050	1	.152
N of Valid Cases	768		

a. 18 cells (37.5%) have expected count less than 5. The minimum expected count is 1.09.

Table E10

			% nonwhite in course				Total
			0-25%	26-50%	51-75%	76-100%	
Teacher's task example	Prompt response	Count	$136_{a, b}$	$40_{a, b}$	32_{b}	18_{a}	226
		% within Teacher's task example	60.2%	17.7%	14.2%	8.0%	100.0%
		% within % nonwhite in course	28.9%	32.0%	36.0%	21.4%	29.4%
	Original argument/thesis	Count	64_{a}	21_{a}	13_{a}	10_{a}	108
		% within Teacher's task example	59.3%	19.4%	12.0%	9.3%	100.0%
		% within % nonwhite in course	13.6%	16.8%	14.6%	11.9%	14.1%
	Original perspective/analysis	Count	25_{a}	7_{a}	2_{a}	1_{a}	35
		% within Teacher's task example	71.4%	20.0%	5.7%	2.9%	100.0%
		% within % nonwhite in course	5.3%	5.6%	2.2%	1.2%	4.6%
	Connecting to texts/topics	Count	25_{a}	7_{a}	3_{a}	5_{a}	40
		% within Teacher's task example	62.5%	17.5%	7.5%	12.5%	100.0%
		% within % nonwhite in course	5.3%	5.6%	3.4%	6.0%	5.2%

			% nonwhite in course				Total
			0-25%	26-50%	51-75%	76-100%	
	Summary	Count	16_a	3_a	1_a	1_a	21
		% within Teacher's task example	76.2%	14.3%	4.8%	4.8%	100.0%
		% within % nonwhite in course	3.4%	2.4%	1.1%	1.2%	2.7%
	Analysis of themes/ideas	Count	18_a	$4_{a, b}$	8_b	$5_{a, b}$	35
		% within Teacher's task example	51.4%	11.4%	22.9%	14.3%	100.0%
		% within % nonwhite in course	3.8%	3.2%	9.0%	6.0%	4.6%
	Literary analysis	Count	33_a	5_a	5_a	3_a	46
		% within Teacher's task example	71.7%	10.9%	10.9%	6.5%	100.0%
		% within % nonwhite in course	7.0%	4.0%	5.6%	3.6%	6.0%
	Literary argument	Count	$7_{a, b}$	0_b	4_a	$1_{a, b}$	12
		% within Teacher's task example	58.3%	0.0%	33.3%	8.3%	100.0%
		% within % nonwhite in course	1.5%	0.0%	4.5%	1.2%	1.6%
	Composition support	Count	35_a	14_a	6_a	7_a	62
		% within Teacher's task example	56.5%	22.6%	9.7%	11.3%	100.0%
		% within % nonwhite in course	7.4%	11.2%	6.7%	8.3%	8.1%
	No synthesis	Count	93_a	$20_{a, b}$	9_b	31_c	153
		% within Teacher's task example	60.8%	13.1%	5.9%	20.3%	100.0%
		% within % nonwhite in course	19.8%	16.0%	10.1%	36.9%	19.9%
	Rhetorical analysis	Count	5_a	2_a	3_a	0_a	10
		% within Teacher's task example	50.0%	20.0%	30.0%	0.0%	100.0%
		% within % nonwhite in course	1.1%	1.6%	3.4%	0.0%	1.3%
	Argument	Count	13_a	2_a	3_a	2_a	20
		% within Teacher's task example	65.0%	10.0%	15.0%	10.0%	100.0%
		% within % nonwhite in course	2.8%	1.6%	3.4%	2.4%	2.6%
Total		Count	470	125	89	84	768
		% within Teacher's task example	61.2%	16.3%	11.6%	10.9%	100.0%
		% within % nonwhite in course	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of % nonwhite in course categories whose column proportions do not differ significantly from each other at the .05 level.

Appendix F: Frequency of synthesis-writing tasks

Table F1

Frequency of synthesis-writing tasks and years of teaching experience

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.084[a]	18	.787
Likelihood Ratio	13.472	18	.763
Linear-by-Linear Association	.129	1	.720
N of Valid Cases	853		

a. 7 cells (25.0%) have expected count less than 5. The minimum expected count is .94.

Table F2

Frequency of synthesis-writing tasks and school setting

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.039[a]	6	.235
Likelihood Ratio	8.057	6	.234
Linear-by-Linear Association	.015	1	.902
N of Valid Cases	852		

a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 1.42.

Table F3

Frequency of synthesis-writing tasks and type of school

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.142[a]	15	.591
Likelihood Ratio	15.232	15	.435
Linear-by-Linear Association	.612	1	.434
N of Valid Cases	852		

a. 7 cells (29.2%) have expected count less than 5. The minimum expected count is .26.

Table F4

Frequency of synthesis-writing tasks and percent of nonwhite students in the school

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.596[a]	9	.475
Likelihood Ratio	8.739	9	.462
Linear-by-Linear Association	1.222	1	.269
N of Valid Cases	835		

a. 3 cells (18.8%) have expected count less than 5. The minimum expected count is .90.

Table F5

Frequency of synthesis-writing tasks and % low-SES students in the school

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.949[a]	12	.117
Likelihood Ratio	18.612	12	.098
Linear-by-Linear Association	7.196	1	.007
N of Valid Cases	839		

a. 5 cells (25.0%) have expected count less than 5. The minimum expected count is .80.

Table F6

Frequency of synthesis-writing and description of synthesis task

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	45.672[a]	33	.070
Likelihood Ratio	45.881	33	.067
Linear-by-Linear Association	3.681	1	.055
N of Valid Cases	882		

a. 17 cells (35.4%) have expected count less than 5. The minimum expected count is .02.

Table F7

Frequency of synthesis-writing tasks and ELA course type

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Frequency of synth writing * Type of course	1167	95.9%	50	4.1%	1217	100.0%

Table F8

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	70.000[a]	24	.000
Likelihood Ratio	64.154	24	.000
Linear-by-Linear Association	.137	1	.712
N of Valid Cases	1167		

a. 9 cells (25.0%) have expected count less than 5. The minimum expected count is .27.

Table F9

Frequency of synthesis writing * Type of course Crosstabulation

			Type of course									Total
			AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	
Frequency of synthesis writing	Not at all	Count	$1_{a, b, c}$	6_{d}	$0_{a, b, c, d}$	$0_{a, b, c, d}$	$1_{c, d}$	$2_{a, b, c}$	0_{b}	$2_{a, b, c}$	$1_{a, c, d}$	13
		% within Frequency of synthesis writing	7.7%	46.2%	0.0%	0.0%	7.7%	15.4%	0.0%	15.4%	7.7%	100.0%
		% within Type of course	0.4%	5.5%	0.0%	0.0%	2.5%	1.0%	0.0%	1.0%	2.1%	1.1%
	2-4 times per year	Count	$56_{a, b, c, d, e}$	$19_{d, e}$	$10_{a, b, c, d, e, f}$	$2_{c, e}$	$9_{a, b, c, d, e, f}$	58_{f}	$62_{b, f}$	$57_{b, f}$	$6_{a, c, d, e}$	279
		% within Frequency of synthesis writing	20.1%	6.8%	3.6%	0.7%	3.2%	20.8%	22.2%	20.4%	2.2%	100.0%
		% within Type of course	20.5%	17.3%	23.3%	8.3%	22.5%	29.6%	27.1%	27.8%	12.8%	23.9%
	Monthly	Count	122_{a}	33_{b}	12_{b}	5_{b}	9_{b}	55_{b}	72_{b}	53_{b}	$14_{a, b}$	375
		% within Frequency of synthesis writing	32.5%	8.8%	3.2%	1.3%	2.4%	14.7%	19.2%	14.1%	3.7%	100.0%
		% within Type of course	44.7%	30.0%	27.9%	20.8%	22.5%	28.1%	31.4%	25.9%	29.8%	32.1%
	Once or more per week	Count	94_{a}	52_{b}	$21_{a, b, c}$	17_{c}	$21_{b, c}$	$81_{a, b}$	$95_{a, b}$	93_{b}	$26_{b, c}$	500
		% within Frequency of synthesis writing	18.8%	10.4%	4.2%	3.4%	4.2%	16.2%	19.0%	18.6%	5.2%	100.0%
		% within Type of course	34.4%	47.3%	48.8%	70.8%	52.5%	41.3%	41.5%	45.4%	55.3%	42.8%
Total		Count	273	110	43	24	40	196	229	205	47	1167
		% within Frequency of synthesis writing	23.4%	9.4%	3.7%	2.1%	3.4%	16.8%	19.6%	17.6%	4.0%	100.0%
		% within Type of course	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Type of course categories whose column proportions do not differ significantly from each other at the .05 level.

Frequency of synthesis-writing tasks and % nonwhite students in the ELA course

Table F10

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Frequency of synthesis writing * % nonwhite in course	851	69.9%	366	30.1%	1217	100.0%

Table F11

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.092[a]	9	.047
Likelihood Ratio	17.135	9	.047
Linear-by-Linear Association	2.253	1	.133
N of Valid Cases	851		

a. 3 cells (18.8%) have expected count less than 5. The minimum expected count is 1.19.

Table F12

Frequency of synthesis writing * % nonwhite in course Crosstabulation

			% nonwhite in course				Total
			0-25%	26-50%	51-75%	76-100%	
Frequency of synthesis writing	Not at all	Count	7_a	1_a	2_a	1_a	11
		% within Frequency of synthesis writing	63.6%	9.1%	18.2%	9.1%	100.0%
		% within % nonwhite in course	1.3%	0.7%	2.0%	1.1%	1.3%
	2-4 times per year	Count	$123_{a, b}$	$29_{a, b}$	33_b	17_a	202
		% within Frequency of synthesis writing	60.9%	14.4%	16.3%	8.4%	100.0%
		% within % nonwhite in course	23.5%	21.5%	32.7%	18.5%	23.7%
	Monthly	Count	189_a	$44_{a, b}$	22_b	$24_{a, b}$	279
		% within Frequency of synthesis writing	67.7%	15.8%	7.9%	8.6%	100.0%
		% within % nonwhite in course	36.1%	32.6%	21.8%	26.1%	32.8%
	Once or more per week	Count	204_a	$61_{a, b}$	$44_{a, b}$	50_b	359
		% within Frequency of synthesis writing	56.8%	17.0%	12.3%	13.9%	100.0%
		% within % nonwhite in course	39.0%	45.2%	43.6%	54.3%	42.2%
Total		Count	523	135	101	92	851
		% within Frequency of synthesis writing	61.5%	15.9%	11.9%	10.8%	100.0%
		% within % nonwhite in course	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of % nonwhite in course categories whose column proportions do not differ significantly from each other at the .05 level.

Frequency of synthesis-writing tasks and definition of *synthesis writing*

Table F13

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Frequency of synth writing * Teacher's synthesis definition	946	77.7%	271	22.3%	1217	100.0%

Table F14

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	75.933[a]	33	.000
Likelihood Ratio	72.283	33	.000
Linear-by-Linear Association	3.361	1	.067
N of Valid Cases	946		

a. 19 cells (39.6%) have expected count less than 5. The minimum expected count is .01.

Table F15

Frequency of synthesis writing * Teacher's synthesis definition Crosstabulation

			Prompt response	Original argument/ thesis	Original perspective / analysis	Connecting to texts/ topics	Summary	Analysis of themes/ ideas	Literary analysis	Literary argument	Composition support	No synthesis	Rhetorical analysis	Argument	Total
Frequency of synthesis writing	Not at all	Count	$0_{a, b, c}$	0_{c}	$1_{a, b, c}$	$0_{a, b, c}$	$0_{a, b, c}$	$0_{a, b, c}$	1_{b}	$0_{a, b, c}$	$1_{a, b, c}$	$0_{a, c}$	$0_{a, b, c}$	$0_{a, b, c}$	3
		% within Frequency of synthesis writing	0.0%	0.0%	33.3%	0.0%	0.0%	0.0%	33.3%	0.0%	33.3%	0.0%	0.0%	0.0%	100.0%
		% within Teacher's synthesis definition	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	3.4%	0.0%	0.5%	0.0%	0.0%	0.0%	0.3%
	2-4 times per year	Count	$14_{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p}$	$58_{e, f, g, h, m, n, o, p, q, r}$	$26_{c, d, g, h, k, l, o, p, q, r}$	$10_{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r}$	$8_{i, j, k, l, m, n, o, p, r}$	$6_{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r}$	$4_{a, b, c, d, e, f, g, h}$	$1_{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r}$	$53_{b, d, f, h, j, l, n, p, q, r}$	16_{a}	$0_{a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r}$	$30_{q, r}$	226

			Prompt response	Original argument/ thesis	Original perspective / analysis	Connecting to texts/ topics	Summary	Analysis of themes/ ideas	Literary analysis	Literary argument	Composition support	No synthesis	Rhetorical analysis	Argument	Total
		% within Frequency of synthesis writing	6.2%	25.7%	11.5%	4.4%	3.5%	2.7%	1.8%	0.4%	23.5%	7.1%	0.0%	13.3%	100.0%
		% within Teacher's synthesis definition	20.0%	27.5%	24.5%	20.4%	40.0%	17.6%	13.8%	33.3%	26.2%	12.2%	0.0%	34.9%	23.9%
	Monthly	Count	33_{a}	$83_{a, b}$	$32_{b, c, d, e}$	$15_{a, b, c, d, e}$	$3_{c, d, e}$	$10_{a, b, c, d, e}$	$11_{a, b, c, d, e}$	$1_{a, b, c, d, e}$	$63_{b, e}$	28_{d}	$3_{a, b}$	$30_{a, b, c, e}$	312
		% within Frequency of synthesis writing	10.6%	26.6%	10.3%	4.8%	1.0%	3.2%	3.5%	0.3%	20.2%	9.0%	1.0%	9.6%	100.0%
		% within Teacher's synthesis definition	47.1%	39.3%	30.2%	30.6%	15.0%	29.4%	37.9%	33.3%	31.2%	21.4%	60.0%	34.9%	33.0%
	Once or more per week	Count	$23_{a, b, c, d}$	$70_{c, d}$	$47_{b, d, e}$	$24_{b, e}$	$9_{a, b, c, d, e, f}$	$18_{e, f}$	$13_{a, b, c, d, e}$	$1_{a, b, c, d, e, f}$	$85_{a, b, c, d, e}$	87_{f}	$2_{a, b, c, d, e, f}$	$26_{a, c}$	405
		% within Frequency of synthesis writing	5.7%	17.3%	11.6%	5.9%	2.2%	4.4%	3.2%	0.2%	21.0%	21.5%	0.5%	6.4%	100.0%
		% within Teacher's synthesis definition	32.9%	33.2%	44.3%	49.0%	45.0%	52.9%	44.8%	33.3%	42.1%	66.4%	40.0%	30.2%	42.8%
Total		Count	70	211	106	49	20	34	29	3	202	131	5	86	946
		% within Frequency of synthesis writing	7.4%	22.3%	11.2%	5.2%	2.1%	3.6%	3.1%	0.3%	21.4%	13.8%	0.5%	9.1%	100.0%
		% within Teacher's synthesis definition	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Teacher's synthesis definition categories whose column proportions do not differ significantly from each other at the .05 level.

Appendix G

Instruction on synthesis-writing strategies

Table G1

Frequency of instruction on synthesis-writing strategies

		Teach discourse expectations	Teach rhetorical context	Teach source selection	Teach rhetorical reading	Teach information integration	Teach information balance	Teach audience awareness	Teach type of writing task	Teach organizational structures	Teach source use for own purpose
N	Valid	901	903	907	905	906	903	906	906	908	905
	Missing	316	314	310	312	311	314	311	311	309	312
Mean		3.23	3.21	3.40	3.04	3.41	3.24	3.44	3.62	3.38	3.44
Median		3.00	3.00	4.00	3.00	4.00	3.00	4.00	4.00	4.00	4.00
Mode		4	4	4	4	4	4	4	4	4	4
Skewness		-.762	-.761	-.945	-.484	-.886	-.696	-1.156	-1.779	-.967	-1.140
Std. Error of Skewness		.081	.081	.081	.081	.081	.081	.081	.081	.081	.081
Kurtosis		-.479	-.513	-.281	-.769	-.464	-.305	.282	2.479	-.059	.486
Std. Error of Kurtosis		.163	.163	.162	.162	.162	.163	.162	.162	.162	.162
Sum		2913	2900	3080	2748	3086	2930	3121	3280	3072	3113

Reliability test of frequency of instruction on synthesis-writing strategies

Table G2

Case Processing Summary			
		N	%
Cases	Valid	878	72.1
	Excluded[a]	339	27.9
	Total	1217	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.818	10

Table G3

Item Statistics			
	Mean	Std. Deviation	N
Teach discourse expectations	3.23	.858	878
Teach rhetorical context	3.21	.886	878
Teach source selection	3.39	.784	878
Teach rhetorical reading	3.04	.898	878
Teach information integration	3.40	.751	878
Teach information balance	3.24	.783	878
Teach audience awareness	3.45	.777	878
Teach type of writing task	3.62	.685	878
Teach organizational structures	3.38	.774	878
Teach source use for own purpose	3.44	.748	878

Table G4

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Teach discourse expectations	30.17	19.470	.513	.801
Teach rhetorical context	30.19	18.808	.585	.792
Teach source selection	30.02	20.147	.473	.805
Teach rhetorical reading	30.37	19.314	.503	.802
Teach information integration	30.00	20.426	.456	.806
Teach information balance	30.17	20.511	.418	.810
Teach audience awareness	29.95	20.124	.482	.804
Teach type of writing task	29.79	20.619	.482	.804
Teach organizational structures	30.02	19.856	.527	.799
Teach source use for own purpose	29.97	19.782	.563	.796

Multivariate analysis of frequency of instruction on synthesis-writing strategies

Table G5

Descriptive Statistics			
	Mean	Std. Deviation	N
Teach discourse expectations	3.23	.858	878
Teach rhetorical context	3.21	.886	878
Teach source selection	3.39	.784	878
Teach rhetorical reading	3.04	.898	878
Teach information integration	3.40	.751	878
Teach information balance	3.24	.783	878
Teach audience awareness	3.45	.777	878
Teach type of writing task	3.62	.685	878
Teach organizational structures	3.38	.774	878
Teach source use for own purpose	3.44	.748	878

Table G6

Multivariate Tests[a]									
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
SynthSkillsFreq	Pillai's Trace	.308	42.958[b]	9.000	869.000	.000	.308	386.621	1.000
	Wilks' Lambda	.692	42.958[b]	9.000	869.000	.000	.308	386.621	1.000
	Hotelling's Trace	.445	42.958[b]	9.000	869.000	.000	.308	386.621	1.000
	Roy's Largest Root	.445	42.958[b]	9.000	869.000	.000	.308	386.621	1.000

a. Design: Intercept
Within Subjects Design: SynthSkillsFreq
b. Exact statistic
c. Computed using alpha = .05

Table G7

Mauchly's Test of Sphericity[a]

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
SynthSkillsFreq	.543	532.893	44	.000	.880	.889	.111

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.
a. Design: Intercept
Within Subjects Design: SynthSkillsFreq
b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Table G8

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Para-meter	Observed Power[a]
SynthSkillsFreq	Sphericity Assumed	209.153	9	23.239	53.074	.000	.057	477.668	1.000
	Greenhouse-Geisser	209.153	7.921	26.405	53.074	.000	.057	420.393	1.000
	Huynh-Feldt	209.153	8.000	26.145	53.074	.000	.057	424.586	1.000
	Lower-bound	209.153	1.000	209.153	53.074	.000	.057	53.074	1.000
Error (SynthSkillsFreq)	Sphericity Assumed	3456.047	7893	.438					
	Greenhouse-Geisser	3456.047	6946.590	.498					
	Huynh-Feldt	3456.047	7015.877	.493					
	Lower-bound	3456.047	877.000	3.941					

a. Computed using alpha = .05

Table G9

Tests of Within-Subjects Contrasts

Source	SynthSkillsFreq	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
SynthSkillsFreq	Linear	74.051	1	74.051	131.109	.000	.130	131.109	1.000
	Quadratic	.246	1	.246	.504	.478	.001	.504	.109
	Cubic	16.441	1	16.441	29.957	.000	.033	29.957	1.000
	Order 4	7.975	1	7.975	20.448	.000	.023	20.448	.995
	Order 5	8.043	1	8.043	22.683	.000	.025	22.683	.997
	Order 6	14.815	1	14.815	43.182	.000	.047	43.182	1.000
	Order 7	.895	1	.895	2.526	.112	.003	2.526	.355
	Order 8	43.738	1	43.738	89.268	.000	.092	89.268	1.000
	Order 9	42.948	1	42.948	105.724	.000	.108	105.724	1.000
Error(SynthSkillsFreq)	Linear	495.331	877	.565					
	Quadratic	428.807	877	.489					
	Cubic	481.316	877	.549					
	Order 4	342.035	877	.390					
	Order 5	310.981	877	.355					
	Order 6	300.882	877	.343					
	Order 7	310.733	877	.354					
	Order 8	429.702	877	.490					
	Order 9	356.260	877	.406					

a. Computed using alpha = .05

Table G10

Tests of Between-Subjects Effects

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	97978.235	1	97978.235	40674.202	.000	.979	40674.202	1.000
Error	2112.565	877	2.409					

a. Computed using alpha = .05

Estimates

SynthSkillsFreq	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	3.233	.029	3.177	3.290
2	3.213	.030	3.154	3.272
3	3.388	.026	3.336	3.440
4	3.036	.030	2.977	3.096
5	3.403	.025	3.353	3.453
6	3.238	.026	3.186	3.290
7	3.452	.026	3.401	3.504
8	3.618	.023	3.573	3.664
9	3.383	.026	3.331	3.434
10	3.440	.025	3.390	3.489

Table G11

Pairwise Comparisons

(I) SynthSkillsFreq	(J) SynthSkillsFreq	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.021	.029	.483	-.037	.078
	3	-.155*	.032	.000	-.218	-.092
	4	.197*	.035	.000	.129	.266
	5	-.170*	.034	.000	-.237	-.103
	6	-.005	.034	.895	-.072	.063
	7	-.219*	.033	.000	-.284	-.153
	8	-.385*	.031	.000	-.446	-.323
	9	-.149*	.031	.000	-.210	-.089
	10	-.206*	.032	.000	-.269	-.143
2	1	-.021	.029	.483	-.078	.037
	3	-.175*	.033	.000	-.241	-.110
	4	.177*	.029	.000	.121	.232
	5	-.190*	.034	.000	-.257	-.124
	6	-.025	.035	.470	-.093	.043
	7	-.239*	.033	.000	-.304	-.174
	8	-.405*	.032	.000	-.468	-.343
	9	-.170*	.032	.000	-.233	-.106
	10	-.227*	.031	.000	-.288	-.166

(I) SynthSkillsFreq	(J) SynthSkillsFreq	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
3	1	.155*	.032	.000	.092	.218
	2	.175*	.033	.000	.110	.241
	4	.352*	.034	.000	.285	.419
	5	-.015	.029	.610	-.072	.042
	6	.150*	.032	.000	.088	.213
	7	-.064*	.032	.050	-.127	.000
	8	-.230*	.030	.000	-.289	-.171
	9	.006	.032	.860	-.057	.069
	10	-.051	.029	.081	-.109	.006
4	1	-.197*	.035	.000	-.266	-.129
	2	-.177*	.029	.000	-.232	-.121
	3	-.352*	.034	.000	-.419	-.285
	5	-.367*	.034	.000	-.434	-.300
	6	-.202*	.035	.000	-.270	-.134
	7	-.416*	.034	.000	-.483	-.348
	8	-.582*	.034	.000	-.649	-.515
	9	-.346*	.034	.000	-.413	-.280
	10	-.403*	.032	.000	-.465	-.341
5	1	.170*	.034	.000	.103	.237
	2	.190*	.034	.000	.124	.257
	3	.015	.029	.610	-.042	.072
	4	.367*	.034	.000	.300	.434
	6	.165*	.030	.000	.106	.224
	7	-.049	.032	.127	-.112	.014
	8	-.215*	.030	.000	-.274	-.156
	9	.021	.031	.512	-.041	.082
	10	-.036	.027	.176	-.089	.016
6	1	.005	.034	.895	-.063	.072
	2	.025	.035	.470	-.043	.093
	3	-.150*	.032	.000	-.213	-.088
	4	.202*	.035	.000	.134	.270
	5	-.165*	.030	.000	-.224	-.106
	7	-.214*	.031	.000	-.276	-.153
	8	-.380*	.031	.000	-.441	-.320
	9	-.145*	.033	.000	-.209	-.080
	10	-.202*	.031	.000	-.262	-.142
7	1	.219*	.033	.000	.153	.284
	2	.239*	.033	.000	.174	.304
	3	.064*	.032	.050	.000	.127
	4	.416*	.034	.000	.348	.483
	5	.049	.032	.127	-.014	.112
	6	.214*	.031	.000	.153	.276
	8	-.166*	.025	.000	-.215	-.118
	9	.069*	.030	.021	.010	.129
	10	.013	.031	.682	-.047	.072
8	1	.385*	.031	.000	.323	.446
	2	.405*	.032	.000	.343	.468
	3	.230*	.030	.000	.171	.289
	4	.582*	.034	.000	.515	.649
	5	.215*	.030	.000	.156	.274
	6	.380*	.031	.000	.320	.441

(I) SynthSkillsFreq	(J) SynthSkillsFreq	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
	7	.166*	.025	.000	.118	.215
	9	.236*	.026	.000	.185	.286
	10	.179*	.029	.000	.121	.236
9	1	.149*	.031	.000	.089	.210
	2	.170*	.032	.000	.106	.233
	3	-.006	.032	.860	-.069	.057
	4	.346*	.034	.000	.280	.413
	5	-.021	.031	.512	-.082	.041
	6	.145*	.033	.000	.080	.209
	7	-.069*	.030	.021	-.129	-.010
	8	-.236*	.026	.000	-.286	-.185
	10	-.057*	.027	.037	-.110	-.003
10	1	.206*	.032	.000	.143	.269
	2	.227*	.031	.000	.166	.288
	3	.051	.029	.081	-.006	.109
	4	.403*	.032	.000	.341	.465
	5	.036	.027	.176	-.016	.089
	6	.202*	.031	.000	.142	.262
	7	-.013	.031	.682	-.072	.047
	8	-.179*	.029	.000	-.236	-.121
	9	.057*	.027	.037	.003	.110

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Table G12

Multivariate Tests

	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Pillai's trace	.308	42.958[a]	9.000	869.000	.000	.308	386.621	1.000
Wilks' lambda	.692	42.958[a]	9.000	869.000	.000	.308	386.621	1.000
Hotelling's trace	.445	42.958[a]	9.000	869.000	.000	.308	386.621	1.000
Roy's largest root	.445	42.958[a]	9.000	869.000	.000	.308	386.621	1.000

Each F tests the multivariate effect of SynthSkillsFreq. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Exact statistic

b. Computed using alpha = .05

Backward regression analysis of frequency of instruction on synthesis-writing strategies

Table G13

Descriptive Statistics

	Mean	Std. Deviation	N
SynthSkills	3.3536	.48078	738
ELA course criterion	3.3227	.19347	738
school setting criterion	3.35	.038	738
School type criterion	3.3480	.02902	738
SES in school criterion	3.3456	.02819	738
% nonwhite in course crit	3.3468	.01552	738
years experience criterion	3.3471	.08609	738
synth definitions criterion	3.3457	.07734	738
synthesis task criterion	3.3495	.07246	738
Frequency synth writing criterion	3.3363	.01298	738

Table G14

Correlations

		SynthSkills	ELA course criterion	school setting criterion
Pearson Correlation	SynthSkills	1.000	.286	.089
	ELA course criterion	.286	1.000	.102
	school setting criterion	.089	.102	1.000
	School type criterion	.057	-.025	-.030
	SES in school criterion	.069	.035	.224
	% nonwhite in course crit	.032	.186	.197
	years experience criterion	.215	.129	.054
	synth definitions criterion	.179	.226	.053
	synthesis task criterion	.160	.168	.062
	Frequency synth writing criterion	.043	-.034	.064
Sig. (1-tailed)	SynthSkills	.	.000	.008
	ELA course criterion	.000	.	.003
	school setting criterion	.008	.003	.
	School type criterion	.062	.246	.208
	SES in school criterion	.030	.174	.000
	% nonwhite in course crit	.195	.000	.000
	years experience criterion	.000	.000	.071
	synth definitions criterion	.000	.000	.075
	synthesis task criterion	.000	.000	.047
	Frequency synth writing criterion	.122	.182	.041
N	SynthSkills	738	738	738
	ELA course criterion	738	738	738
	school setting criterion	738	738	738
	School type criterion	738	738	738
	SES in school criterion	738	738	738
	% nonwhite in course crit	738	738	738
	years experience criterion	738	738	738

		SynthSkills	ELA course criterion	school setting criterion
	synth definitions criterion	738	738	738
	synthesis task criterion	738	738	738
	Frequency synth writing criterion	738	738	738

Table G15

Correlations

		School type criterion	SES in school criterion	% nonwhite in course crit
Pearson Correlation	SynthSkills	.057	.069	.032
	ELA course criterion	-.025	.035	.186
	school setting criterion	-.030	.224	.197
	School type criterion	1.000	-.041	-.124
	SES in school criterion	-.041	1.000	.231
	% nonwhite in course crit	-.124	.231	1.000
	years experience criterion	-.047	.044	.048
	synth definitions criterion	.012	.029	.058
	synthesis task criterion	.072	-.014	-.010
	Frequency synth writing criterion	-.028	-.002	.046
Sig. (1-tailed)	SynthSkills	.062	.030	.195
	ELA course criterion	.246	.174	.000
	school setting criterion	.208	.000	.000
	School type criterion	.	.133	.000
	SES in school criterion	.133	.	.000
	% nonwhite in course crit	.000	.000	.
	years experience criterion	.100	.116	.094
	synth definitions criterion	.368	.219	.056
	synthesis task criterion	.026	.348	.393
	Frequency synth writing criterion	.220	.476	.107
N	SynthSkills	738	738	738
	ELA course criterion	738	738	738
	school setting criterion	738	738	738
	School type criterion	738	738	738
	SES in school criterion	738	738	738
	% nonwhite in course crit	738	738	738
	years experience criterion	738	738	738
	synth definitions criterion	738	738	738
	synthesis task criterion	738	738	738
	Frequency synth writing criterion	738	738	738

Table G16

Correlations

		years experience criterion	synth definitions criterion	synthesis task criterion
Pearson Correlation	SynthSkills	.215	.179	.160
	ELA course criterion	.129	.226	.168
	school setting criterion	.054	.053	.062
	School type criterion	-.047	.012	.072
	SES in school criterion	.044	.029	-.014
	% nonwhite in course crit	.048	.058	-.010
	years experience criterion	1.000	.025	.000
	synth definitions criterion	.025	1.000	.318
	synthesis task criterion	.000	.318	1.000
	Frequency synth writing criterion	-.012	.095	.047
Sig. (1-tailed)	SynthSkills	.000	.000	.000
	ELA course criterion	.000	.000	.000
	school setting criterion	.071	.075	.047
	School type criterion	.100	.368	.026
	SES in school criterion	.116	.219	.348
	% nonwhite in course crit	.094	.056	.393
	years experience criterion	.	.248	.500
	synth definitions criterion	.248	.	.000
	synthesis task criterion	.500	.000	.
	Frequency synth writing criterion	.374	.005	.103
N	SynthSkills	738	738	738
	ELA course criterion	738	738	738
	school setting criterion	738	738	738
	School type criterion	738	738	738
	SES in school criterion	738	738	738
	% nonwhite in course crit	738	738	738
	years experience criterion	738	738	738
	synth definitions criterion	738	738	738
	synthesis task criterion	738	738	738
	Frequency synth writing criterion	738	738	738

Table G17

Correlations

		Frequency synth writing criterion
Pearson Correlation	SynthSkills	.043
	ELA course criterion	-.034
	school setting criterion	.064
	School type criterion	-.028
	SES in school criterion	-.002
	% nonwhite in course crit	.046
	years experience criterion	-.012
	synth definitions criterion	.095
	synthesis task criterion	.047
	Frequency synth writing criterion	1.000

		Frequency synth writing criterion
Sig. (1-tailed)	SynthSkills	.122
	ELA course criterion	.182
	school setting criterion	.041
	School type criterion	.220
	SES in school criterion	.476
	% nonwhite in course crit	.107
	years experience criterion	.374
	synth definitions criterion	.005
	synthesis task criterion	.103
	Frequency synth writing criterion	.
N	SynthSkills	738
	ELA course criterion	738
	school setting criterion	738
	School type criterion	738
	SES in school criterion	738
	% nonwhite in course crit	738
	years experience criterion	738
	synth definitions criterion	738
	synthesis task criterion	738
	Frequency synth writing criterion	738

Table G18

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, school setting criterion, % nonwhite in course crit, synth definitions criterion[b]	.	Enter
2	.	% nonwhite in course crit	Backward (criterion: Probability of F-to-remove >= .100).
3	.	school setting criterion	Backward (criterion: Probability of F-to-remove >= .100).
4	.	Frequency synth writing criterion	Backward (criterion: Probability of F-to-remove >= .100).
5	.	SES in school criterion	Backward (criterion: Probability of F-to-remove >= .100).

a. Dependent Variable: SynthSkills
b. All requested variables entered.

Table G19

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.383[a]	.147	.136	.44684	.147	13.915	9
2	.381[b]	.145	.136	.44689	-.001	1.168	1
3	.380[c]	.144	.136	.44688	-.001	.968	1
4	.377[d]	.143	.135	.44703	-.002	1.505	1
5	.374[e]	.140	.134	.44750	-.003	2.522	1

Table G20

Model Summary

Model	Change Statistics	
	df2	Sig. F Change
1	728[a]	.000
2	728[b]	.280
3	729[c]	.325
4	730[d]	.220
5	731[e]	.113

a. Predictors: (Constant), Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, school setting criterion, % nonwhite in course crit, synth definitions criterion
b. Predictors: (Constant), Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, school setting criterion, synth definitions criterion
c. Predictors: (Constant), Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion
d. Predictors: (Constant), SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion
e. Predictors: (Constant), years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion

Table G21

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.004	9	2.778	13.915	.000[b]
	Residual	145.354	728	.200		
	Total	170.359	737			
2	Regression	24.771	8	3.096	15.504	.000[c]
	Residual	145.588	729	.200		
	Total	170.359	737			
3	Regression	24.578	7	3.511	17.582	.000[d]
	Residual	145.781	730	.200		
	Total	170.359	737			
4	Regression	24.277	6	4.046	20.247	.000[e]
	Residual	146.081	731	.200		
	Total	170.359	737			
5	Regression	23.773	5	4.755	23.743	.000[f]
	Residual	146.585	732	.200		
	Total	170.359	737			

a. Dependent Variable: SynthSkills
b. Predictors: (Constant), Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, school setting criterion, % nonwhite in course crit, synth definitions criterion
c. Predictors: (Constant), Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, school setting criterion, synth definitions criterion
d. Predictors: (Constant), Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion
e. Predictors: (Constant), SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion
f. Predictors: (Constant), years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion

Table G22

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-15.125	6.125		-2.470	.014
	ELA course criterion	.578	.090	.233	6.396	.000
	school setting criterion	.506	.452	.040	1.122	.262
	School type criterion	1.057	.574	.064	1.843	.066
	SES in school criterion	.930	.612	.055	1.520	.129
	% nonwhite in course crit	-1.220	1.129	-.039	-1.081	.280
	years experience criterion	1.024	.193	.183	5.295	.000
	synth definitions criterion	.552	.230	.089	2.404	.016
	synthesis task criterion	.561	.242	.084	2.315	.021
	Frequency synth writing criterion	1.543	1.281	.042	1.204	.229
2	(Constant)	-18.554	5.240		-3.541	.000
	ELA course criterion	.561	.089	.226	6.303	.000
	school setting criterion	.440	.447	.035	.984	.325
	School type criterion	1.125	.570	.068	1.972	.049
	SES in school criterion	.802	.600	.047	1.337	.182
	years experience criterion	1.022	.193	.183	5.287	.000
	synth definitions criterion	.547	.230	.088	2.383	.017
	synthesis task criterion	.572	.242	.086	2.364	.018
	Frequency synth writing criterion	1.484	1.280	.040	1.159	.247
3	(Constant)	-17.845	5.190		-3.439	.001
	ELA course criterion	.569	.089	.229	6.405	.000
	School type criterion	1.114	.570	.067	1.954	.051
	SES in school criterion	.933	.585	.055	1.593	.112
	years experience criterion	1.029	.193	.184	5.324	.000
	synth definitions criterion	.548	.230	.088	2.390	.017
	synthesis task criterion	.583	.242	.088	2.412	.016
	Frequency synth writing criterion	1.567	1.277	.042	1.227	.220
4	(Constant)	-12.616	2.961		-4.261	.000
	ELA course criterion	.562	.089	.226	6.342	.000
	School type criterion	1.091	.570	.066	1.913	.056
	SES in school criterion	.930	.586	.055	1.588	.113
	years experience criterion	1.027	.193	.184	5.313	.000
	synth definitions criterion	.575	.229	.092	2.515	.012
	synthesis task criterion	.591	.242	.089	2.444	.015
5	(Constant)	-9.447	2.189		-4.315	.000
	ELA course criterion	.566	.089	.228	6.377	.000
	School type criterion	1.057	.570	.064	1.853	.064
	years experience criterion	1.038	.193	.186	5.371	.000
	synth definitions criterion	.585	.229	.094	2.559	.011
	synthesis task criterion	.581	.242	.088	2.403	.016

a. Dependent Variable: SynthSkills

Table G23

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation
2	% nonwhite in course crit	-.039[b]	-1.081	.280	-.040
3	% nonwhite in course crit	-.034[c]	-.937	.349	-.035
	school setting criterion	.035[c]	.984	.325	.036
4	% nonwhite in course crit	-.031[d]	-.873	.383	-.032
	school setting criterion	.038[d]	1.063	.288	.039
	Frequency synth writing criterion	.042[d]	1.227	.220	.045
5	% nonwhite in course crit	-.017[e]	-.494	.621	-.018
	school setting criterion	.048[e]	1.385	.166	.051
	Frequency synth writing criterion	.042[e]	1.220	.223	.045
	SES in school criterion	.055[e]	1.588	.113	.059

Table G24

Excluded Variables[a]

Model		Collinearity Statistics
		Tolerance
2	% nonwhite in course crit	.882[b]
3	% nonwhite in course crit	.899[c]
	school setting criterion	.933[c]
4	% nonwhite in course crit	.901[d]
	school setting criterion	.937[d]
	Frequency synth writing criterion	.986[d]
5	% nonwhite in course crit	.949[e]
	school setting criterion	.985[e]
	Frequency synth writing criterion	.986[e]
	SES in school criterion	.995[e]

a. Dependent Variable: SynthSkills
b. Predictors in the Model: (Constant), Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, school setting criterion, synth definitions criterion
c. Predictors in the Model: (Constant), Frequency synth writing criterion, SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion
d. Predictors in the Model: (Constant), SES in school criterion, years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion
e. Predictors in the Model: (Constant), years experience criterion, synthesis task criterion, School type criterion, ELA course criterion, synth definitions criterion

ANOVA: Synthesis-writing strategies and ELA course type

Table G25

Descriptives

SynthSkills

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
					Lower Bound
AP English Language	239	3.5540	.43293	.02800	3.4989
AP English Literature	79	3.4122	.44821	.05043	3.3118
IB English	36	3.2778	.54096	.09016	3.0947
Dual credit	22	3.4586	.42108	.08977	3.2719
ELL	23	2.8783	.56645	.11811	2.6333
Honors	148	3.2710	.45704	.03757	3.1968
College prep	171	3.3035	.45748	.03498	3.2345
Regular English	157	3.1673	.50334	.04017	3.0879
Other English	33	3.2822	.56756	.09880	3.0809
Total	908	3.3413	.49234	.01634	3.3092

Table G26

Descriptives

SynthSkills

	95% Confidence Interval for Mean	Minimum	Maximum
	Upper Bound		
AP English Language	3.6092	1.30	4.00
AP English Literature	3.5126	1.80	4.00
IB English	3.4608	2.00	4.00
Dual credit	3.6453	2.20	4.00
ELL	3.1232	1.90	4.00
Honors	3.3453	2.10	4.00
College prep	3.3726	1.80	4.00
Regular English	3.2466	1.90	4.00
Other English	3.4834	1.67	4.00
Total	3.3733	1.30	4.00

Table G27

ANOVA

SynthSkills

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.436	8	2.804	12.771	.000
Within Groups	197.420	899	.220		
Total	219.856	907			

Post Hoc Tests

Table G28

Multiple Comparisons

Dependent Variable: SynthSkills
Tukey HSD

(I) Type of course	(J) Type of course	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
AP English Language	AP English Literature	.14179	.06082	.324	-.0473	.3309
	IB English	.27624*	.08378	.028	.0157	.5367
	Dual credit	.09544	.10441	.992	-.2292	.4201
	ELL	.67576*	.10231	.000	.3577	.9939
	Honors	.28300*	.04902	.000	.1306	.4354
	College prep	.25050*	.04694	.000	.1046	.3964
	Regular English	.38673*	.04814	.000	.2370	.5364
	Other English	.27187*	.08703	.048	.0013	.5425
AP English Literature	AP English Language	-.14179	.06082	.324	-.3309	.0473
	IB English	.13446	.09423	.887	-.1585	.4275
	Dual credit	-.04635	.11297	1.000	-.3976	.3049
	ELL	.53398*	.11103	.000	.1887	.8792
	Honors	.14122	.06530	.431	-.0618	.3442
	College prep	.10872	.06375	.743	-.0895	.3069
	Regular English	.24494*	.06464	.005	.0440	.4459
	Other English	.13008	.09713	.919	-.1719	.4321
IB English	AP English Language	-.27624*	.08378	.028	-.5367	-.0157
	AP English Literature	-.13446	.09423	.887	-.4275	.1585
	Dual credit	-.18081	.12681	.888	-.5751	.2135
	ELL	.39952*	.12509	.039	.0106	.7885
	Honors	.00676	.08708	1.000	-.2640	.2775
	College prep	-.02574	.08593	1.000	-.2929	.2414
	Regular English	.11048	.08660	.938	-.1588	.3797
	Other English	-.00438	.11294	1.000	-.3555	.3468
Dual credit	AP English Language	-.09544	.10441	.992	-.4201	.2292
	AP English Literature	.04635	.11297	1.000	-.3049	.3976

(I) Type of course	(J) Type of course	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	IB English	.18081	.12681	.888	-.2135	.5751
	ELL	.58032*	.13975	.001	.1458	1.0149
	Honors	.18756	.10708	.714	-.1454	.5205
	College prep	.15507	.10614	.873	-.1750	.4851
	Regular English	.29129	.10668	.139	-.0404	.6230
	Other English	.17643	.12898	.910	-.2246	.5775
ELL	AP English Language	-.67576*	.10231	.000	-.9939	-.3577
	AP English Literature	-.53398*	.11103	.000	-.8792	-.1887
	IB English	-.39952*	.12509	.039	-.7885	-.0106
	Dual credit	-.58032*	.13975	.001	-1.0149	-.1458
	Honors	-.39276*	.10503	.006	-.7193	-.0662
	College prep	-.42526*	.10408	.002	-.7489	-.1016
	Regular English	-.28903	.10463	.128	-.6144	.0363
	Other English	-.40389*	.12729	.041	-.7997	-.0081
Honors	AP English Language	-.28300*	.04902	.000	-.4354	-.1306
	AP English Literature	-.14122	.06530	.431	-.3442	.0618
	IB English	-.00676	.08708	1.000	-.2775	.2640
	Dual credit	-.18756	.10708	.714	-.5205	.1454
	ELL	.39276*	.10503	.006	.0662	.7193
	College prep	-.03250	.05261	1.000	-.1961	.1311
	Regular English	.10373	.05369	.592	-.0632	.2707
	Other English	-.01113	.09021	1.000	-.2916	.2694
College prep	AP English Language	-.25050*	.04694	.000	-.3964	-.1046
	AP English Literature	-.10872	.06375	.743	-.3069	.0895
	IB English	.02574	.08593	1.000	-.2414	.2929
	Dual credit	-.15507	.10614	.873	-.4851	.1750
	ELL	.42526*	.10408	.002	.1016	.7489
	Honors	.03250	.05261	1.000	-.1311	.1961
	Regular English	.13623	.05180	.176	-.0248	.2973
	Other English	.02137	.08910	1.000	-.2557	.2984
Regular English	AP English Language	-.38673*	.04814	.000	-.5364	-.2370
	AP English Literature	-.24494*	.06464	.005	-.4459	-.0440
	IB English	-.11048	.08660	.938	-.3797	.1588
	Dual credit	-.29129	.10668	.139	-.6230	.0404
	ELL	.28903	.10463	.128	-.0363	.6144
	Honors	-.10373	.05369	.592	-.2707	.0632
	College prep	-.13623	.05180	.176	-.2973	.0248
	Other English	-.11486	.08974	.937	-.3939	.1642
Other English	AP English Language	-.27187*	.08703	.048	-.5425	-.0013
	AP English Literature	-.13008	.09713	.919	-.4321	.1719
	IB English	.00438	.11294	1.000	-.3468	.3555

(I) Type of course	(J) Type of course	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Dual credit	-.17643	.12898	.910	-.5775	.2246
	ELL	.40389*	.12729	.041	.0081	.7997
	Honors	.01113	.09021	1.000	-.2694	.2916
	College prep	-.02137	.08910	1.000	-.2984	.2557
	Regular English	.11486	.08974	.937	-.1642	.3939

*. The mean difference is significant at the 0.05 level.

Table G29

Homogeneous Subsets

SynthSkills

Tukey HSD[a,b]

Type of course	N	Subset for alpha = 0.05		
		1	2	3
ELL	23	2.8783		
Regular English	157	3.1673	3.1673	
Honors	148		3.2710	3.2710
IB English	36		3.2778	3.2778
Other English	33		3.2822	3.2822
College prep	171		3.3035	3.3035
AP English Literature	79		3.4122	3.4122
Dual credit	22		3.4586	3.4586
AP English Language	239			3.5540
Sig.		.058	.054	.069

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 49.226.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

ANOVA: School type and frequency of instruction on synthesis-writing strategies

Table G30

Descriptives

SynthSkills

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Conventional public	602	3.3508	.49254	.02007	3.3114	3.3903
Public charter	20	3.3400	.40833	.09131	3.1489	3.5311
Public magnet	33	3.4158	.35502	.06180	3.2899	3.5417
Independent	85	3.3731	.49514	.05371	3.2663	3.4799
Parochial	77	3.2646	.48679	.05547	3.1541	3.3751
Boarding/other	20	3.2572	.48581	.10863	3.0299	3.4846
Total	837	3.3452	.48543	.01678	3.3123	3.3782

Table G31

Descriptives

SynthSkills

	Minimum	Maximum
Conventional public	1.67	4.00
Public charter	2.50	4.00
Public magnet	2.80	4.00
Independent	1.30	4.00
Parochial	1.80	4.00
Boarding/other	2.30	4.00
Total	1.30	4.00

Table G32

ANOVA

SynthSkills

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.905	5	.181	.767	.573
Within Groups	196.090	831	.236		
Total	196.995	836			

Post Hoc Tests

Table G33

Multiple Comparisons

Dependent Variable: SynthSkills
Tukey HSD

(I) Type of school	(J) Type of school	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
Conventional public	Public charter	.01083	.11041	1.000	-.3045
	Public magnet	-.06499	.08685	.976	-.3131
	Independent	-.02228	.05629	.999	-.1831
	Parochial	.08622	.05879	.686	-.0817
	Boarding/other	.09361	.11041	.958	-.2218
Public charter	Conventional public	-.01083	.11041	1.000	-.3262
	Public magnet	-.07582	.13766	.994	-.4690
	Independent	-.03311	.12073	1.000	-.3779
	Parochial	.07539	.12191	.990	-.2728
	Boarding/other	.08278	.15361	.995	-.3560
Public magnet	Conventional public	.06499	.08685	.976	-.1831
	Public charter	.07582	.13766	.994	-.3174
	Independent	.04272	.09963	.998	-.2419
	Parochial	.15121	.10107	.667	-.1375
	Boarding/other	.15860	.13766	.859	-.2346
Independent	Conventional public	.02228	.05629	.999	-.1385
	Public charter	.03311	.12073	1.000	-.3117
	Public magnet	-.04272	.09963	.998	-.3273
	Parochial	.10850	.07642	.715	-.1098
	Boarding/other	.11589	.12073	.930	-.2289
Parochial	Conventional public	-.08622	.05879	.686	-.2542
	Public charter	-.07539	.12191	.990	-.4236
	Public magnet	-.15121	.10107	.667	-.4399
	Independent	-.10850	.07642	.715	-.3268
	Boarding/other	.00739	.12191	1.000	-.3408
Boarding/other	Conventional public	-.09361	.11041	.958	-.4090
	Public charter	-.08278	.15361	.995	-.5216
	Public magnet	-.15860	.13766	.859	-.5518
	Independent	-.11589	.12073	.930	-.4607
	Parochial	-.00739	.12191	1.000	-.3556

Table G34

Multiple Comparisons

Dependent Variable: SynthSkills
Tukey HSD

(I) Type of school	(J) Type of school	95% Confidence Interval
		Upper Bound
Conventional public	Public charter	.3262
	Public magnet	.1831
	Independent	.1385
	Parochial	.2542
	Boarding/other	.4090
Public charter	Conventional public	.3045
	Public magnet	.3174
	Independent	.3117
	Parochial	.4236
	Boarding/other	.5216
Public magnet	Conventional public	.3131
	Public charter	.4690
	Independent	.3273
	Parochial	.4399
	Boarding/other	.5518
Independent	Conventional public	.1831
	Public charter	.3779
	Public magnet	.2419
	Parochial	.3268
	Boarding/other	.4607
Parochial	Conventional public	.0817
	Public charter	.2728
	Public magnet	.1375
	Independent	.1098
	Boarding/other	.3556
Boarding/other	Conventional public	.2218
	Public charter	.3560
	Public magnet	.2346
	Independent	.2289
	Parochial	.3408

Table G35

Homogeneous Subsets

SynthSkills

Tukey HSD[a,b]

Type of school	N	Subset for alpha = 0.05
		1
Boarding/other	20	3.2572
Parochial	77	3.2646
Public charter	20	3.3400
Conventional public	602	3.3508
Independent	85	3.3731
Public magnet	33	3.4158
Sig.		.710

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 38.286.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Appendix H

Backward Regression Analysis of Frequency of Use of Pedagogical Strategies

Multivariate analysis of frequency of pedagogical strategies scale

Table H1

Descriptive Statistics

	Mean	Std. Deviation	N
Understand writing task	3.80	.467	849
Model synthesis writing	3.04	.835	849
Scaffold learning	3.28	.799	849
Use cooperative learning	3.00	.821	849
Provide feedback about writing	3.71	.539	849
Use peer feedback	2.91	.843	849
Use Internet source materials	2.84	.900	849
Use multimedia publication	2.23	.937	849
Review/reflect on writing	3.12	.812	849

Table H2

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
PedFreq	Pillai's Trace	.755	323.910[b]	8.000	841.000	.000	.755	2591.281	1.000
	Wilks' Lambda	.245	323.910[b]	8.000	841.000	.000	.755	2591.281	1.000
	Hotelling's Trace	3.081	323.910[b]	8.000	841.000	.000	.755	2591.281	1.000
	Roy's Largest Root	3.081	323.910[b]	8.000	841.000	.000	.755	2591.281	1.000

a. Design: Intercept
Within Subjects Design: PedFreq
b. Exact statistic
c. Computed using alpha = .05

Table H3

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
PedFreq	.488	606.149	35	.000	.843	.850	.125

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept
Within Subjects Design: PedFreq

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Table H4

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
PedFreq	Sphericity Assumed	1492.787	8	186.598	402.707	.000	.322	3221.655	1.000
	Greenhouse-Geisser	1492.787	6.742	221.430	402.707	.000	.322	2714.877	1.000
	Huynh-Feldt	1492.787	6.801	219.488	402.707	.000	.322	2738.903	1.000
	Lower-bound	1492.787	1.000	1492.787	402.707	.000	.322	402.707	1.000
Error(PedFreq)	Sphericity Assumed	3143.435	6784	.463					
	Greenhouse-Geisser	3143.435	5716.851	.550					
	Huynh-Feldt	3143.435	5767.444	.545					
	Lower-bound	3143.435	848.000	3.707					

a. Computed using alpha = .05

Table H5

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	PedFreq	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
PedFreq	Linear	526.745	1	526.745	808.341	.000	.488	808.341	1.000
	Quadratic	14.452	1	14.452	38.083	.000	.043	38.083	1.000
	Cubic	6.212	1	6.212	11.317	.001	.013	11.317	.919
	Order 4	637.251	1	637.251	1179.923	.000	.582	1179.923	1.000
	Order 5	22.621	1	22.621	54.248	.000	.060	54.248	1.000
	Order 6	9.357	1	9.357	26.050	.000	.030	26.050	.999
	Order 7	.368	1	.368	1.056	.304	.001	1.056	.177
	Order 8	275.780	1	275.780	597.355	.000	.413	597.355	1.000
Error(PedFreq)	Linear	552.588	848	.652					
	Quadratic	321.809	848	.379					
	Cubic	465.470	848	.549					
	Order 4	457.986	848	.540					
	Order 5	353.610	848	.417					
	Order 6	304.591	848	.359					
	Order 7	295.886	848	.349					
	Order 8	391.496	848	.462					

a. Computed using alpha = .05

Table H6

Pairwise Comparisons

Measure: MEASURE_1

(I) PedFreq	(J) PedFreq	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.761*	.029	.000	.703	.818
	3	.516*	.030	.000	.458	.574
	4	.793*	.031	.000	.733	.853
	5	.091*	.022	.000	.048	.133
	6	.889*	.032	.000	.827	.951
	7	.953*	.034	.000	.886	1.020
	8	1.567*	.035	.000	1.497	1.636
	9	.678*	.030	.000	.620	.737
2	1	-.761*	.029	.000	-.818	-.703
	3	-.245*	.029	.000	-.302	-.188
	4	.032	.032	.315	-.030	.094
	5	-.670*	.031	.000	-.730	-.610
	6	.128*	.034	.000	.061	.196
	7	.192*	.038	.000	.118	.266
	8	.806*	.039	.000	.729	.882
	9	-.082*	.034	.016	-.149	-.015
3	1	-.516*	.030	.000	-.574	-.458
	2	.245*	.029	.000	.188	.302
	4	.277*	.029	.000	.219	.334
	5	-.425*	.031	.000	-.486	-.364

(I) PedFreq	(J) PedFreq	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
	6	.373*	.034	.000	.307	.440
	7	.437*	.037	.000	.364	.510
	8	1.051*	.039	.000	.975	1.127
	9	.163*	.034	.000	.096	.230
4	1	-.793*	.031	.000	-.853	-.733
	2	-.032	.032	.315	-.094	.030
	3	-.277*	.029	.000	-.334	-.219
	5	-.702*	.031	.000	-.763	-.641
	6	.097*	.029	.001	.039	.154
	7	.160*	.036	.000	.089	.231
	8	.774*	.037	.000	.701	.846
	9	-.114*	.033	.001	-.179	-.050
5	1	-.091*	.022	.000	-.133	-.048
	2	.670*	.031	.000	.610	.730
	3	.425*	.031	.000	.364	.486
	4	.702*	.031	.000	.641	.763
	6	.799*	.031	.000	.738	.859
	7	.862*	.032	.000	.800	.925
	8	1.476*	.034	.000	1.409	1.543
	9	.588*	.029	.000	.531	.645
6	1	-.889*	.032	.000	-.951	-.827
	2	-.128*	.034	.000	-.196	-.061
	3	-.373*	.034	.000	-.440	-.307
	4	-.097*	.029	.001	-.154	-.039
	5	-.799*	.031	.000	-.859	-.738
	7	.064	.035	.073	-.006	.133
	8	.677*	.037	.000	.605	.750
	9	-.211*	.032	.000	-.274	-.148
7	1	-.953*	.034	.000	-1.020	-.886
	2	-.192*	.038	.000	-.266	-.118
	3	-.437*	.037	.000	-.510	-.364
	4	-.160*	.036	.000	-.231	-.089
	5	-.862*	.032	.000	-.925	-.800
	6	-.064	.035	.073	-.133	.006
	8	.614*	.032	.000	.552	.676
	9	-.274*	.037	.000	-.346	-.203
8	1	-1.567*	.035	.000	-1.636	-1.497
	2	-.806*	.039	.000	-.882	-.729
	3	-1.051*	.039	.000	-1.127	-.975
	4	-.774*	.037	.000	-.846	-.701
	5	-1.476*	.034	.000	-1.543	-1.409
	6	-.677*	.037	.000	-.750	-.605
	7	-.614*	.032	.000	-.676	-.552
	9	-.888*	.036	.000	-.959	-.818
9	1	-.678*	.030	.000	-.737	-.620
	2	.082*	.034	.016	.015	.149
	3	-.163*	.034	.000	-.230	-.096
	4	.114*	.033	.001	.050	.179
	5	-.588*	.029	.000	-.645	-.531
	6	.211*	.032	.000	.148	.274
	7	.274*	.037	.000	.203	.346

(I) PedFreq	(J) PedFreq	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
	8	.888*	.036	.000	.818	.959

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Table H7

Multivariate Tests

	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Pillai's trace	.755	323.910[a]	8.000	841.000	.000	.755	2591.281	1.000
Wilks' lambda	.245	323.910[a]	8.000	841.000	.000	.755	2591.281	1.000
Hotelling's trace	3.081	323.910[a]	8.000	841.000	.000	.755	2591.281	1.000
Roy's largest root	3.081	323.910[a]	8.000	841.000	.000	.755	2591.281	1.000

Each F tests the multivariate effect of PedFreq. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Exact statistic

b. Computed using alpha = .05

Reliability test for Pedagogy variables

Table H8

Case Processing Summary

		N	%
Cases	Valid	849	69.8
	Excluded[a]	368	30.2
	Total	1217	100.0

a. Listwise deletion based on all variables in the procedure.

Table H9

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.752	.747	9

Table H10

Item Statistics

	Mean	Std. Deviation	N
Understand writing task	3.80	.467	849
Model synthesis writing	3.04	.835	849
Scaffold learning	3.28	.799	849
Use cooperative learning	3.00	.821	849
Provide feedback about writing	3.71	.539	849
Use peer feedback	2.91	.843	849
Use Internet source materials	2.84	.900	849
Use multimedia publication	2.23	.937	849
Review/reflect on writing	3.12	.812	849

Table H11

Inter-Item Correlation Matrix

	Under-stand writing task	Model synthesis writing	Scaffold learning	Use coopera-tive learning	Provide feedback about writing	Use peer feedback	Use Internet source materials	Use multi-media publica-tion	Review/ reflect on writing
Understand writing task	1.000	.239	.150	.128	.209	.108	.060	.050	.163
Model synthesis writing	.239	1.000	.467	.381	.213	.293	.200	.185	.272
Scaffold learning	.150	.467	1.000	.444	.132	.285	.202	.165	.237
Use cooperative learning	.128	.381	.444	1.000	.155	.471	.259	.258	.314
Provide feedback about writing	.209	.213	.132	.155	1.000	.221	.246	.169	.266
Use peer feedback	.108	.293	.285	.471	.221	1.000	.301	.276	.355
Use Internet source materials	.060	.200	.202	.259	.246	.301	1.000	.498	.229
Use multimedia publication	.050	.185	.165	.258	.169	.276	.498	1.000	.289
Review/reflect on writing	.163	.272	.237	.314	.266	.355	.229	.289	1.000

Table H12

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.103	2.231	3.797	1.567	1.702	.220	9
Item Variances	.620	.218	.878	.660	4.022	.049	9
Inter-Item Correlations	.247	.050	.498	.448	9.889	.012	9

Table H13

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Understand writing task	24.13	15.822	.217	.091	.756
Model synthesis writing	24.89	13.251	.476	.303	.722
Scaffold learning	24.65	13.547	.452	.306	.726
Use cooperative learning	24.92	12.980	.539	.359	.711
Provide feedback about writing	24.22	15.166	.331	.147	.744
Use peer feedback	25.02	13.021	.512	.305	.716
Use Internet source materials	25.08	13.139	.444	.303	.728
Use multimedia publication	25.70	13.102	.422	.292	.733
Review/reflect on writing	24.81	13.475	.455	.227	.726

Table H14

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
27.93	16.846	4.104	9

Backward Regression

Table H15

Descriptive Statistics

	Mean	Std. Deviation	N
Pedagogy	3.1114	.44453	733
Course_PedStrat_Crit	3.1024	.06900	733
SettingPedCrit	3.1058	.01636	733
TypePedCrit	3.1072	.07180	733
SESPedCrit	3.1072	.05616	733
ClassEthPedCrit	3.1064	.02834	733
SynthDefPedCrit	3.1109	.05757	733
TaskExPedCrit	3.1106	.05403	733
FreqPedCrit	3.1033	.03577	733
ExpPedCrit	3.1054	.03160	733

Table H16

Correlations

		Pedagogy	Course_PedStrat_Crit	SettingPedCrit	TypePedCrit
Pearson Correlation	Pedagogy	1.000	.167	.035	.160
	Course_PedStrat_Crit	.167	1.000	.005	.100
	SettingPedCrit	.035	.005	1.000	.091
	TypePedCrit	.160	.100	.091	1.000
	SESPedCrit	.111	.119	.128	.362
	ClassEthPedCrit	.059	.117	-.006	-.048
	SynthDefPedCrit	.126	-.035	-.084	-.032
	TaskExPedCrit	.107	.071	.016	.052
	FreqPedCrit	.047	.048	.080	.008
	ExpPedCrit	.083	-.036	.002	-.002
Sig. (1-tailed)	Pedagogy	.	.000	.173	.000
	Course_PedStrat_Crit	.000	.	.451	.003
	SettingPedCrit	.173	.451	.	.007
	TypePedCrit	.000	.003	.007	.
	SESPedCrit	.001	.001	.000	.000
	ClassEthPedCrit	.056	.001	.434	.096
	SynthDefPedCrit	.000	.169	.011	.197
	TaskExPedCrit	.002	.028	.328	.079
	FreqPedCrit	.104	.096	.016	.410
	ExpPedCrit	.013	.167	.481	.482
N	Pedagogy	733	733	733	733
	Course_PedStrat_Crit	733	733	733	733
	SettingPedCrit	733	733	733	733
	TypePedCrit	733	733	733	733
	SESPedCrit	733	733	733	733
	ClassEthPedCrit	733	733	733	733
	SynthDefPedCrit	733	733	733	733
	TaskExPedCrit	733	733	733	733
	FreqPedCrit	733	733	733	733
	ExpPedCrit	733	733	733	733

Table H17

Correlations

		SESPedCrit	ClassEthPedCrit	SynthDefPedCrit
Pearson Correlation	Pedagogy	.111	.059	.126
	Course_PedStrat_Crit	.119	.117	-.035
	SettingPedCrit	.128	-.006	-.084
	TypePedCrit	.362	-.048	-.032
	SESPedCrit	1.000	.189	-.031
	ClassEthPedCrit	.189	1.000	-.063
	SynthDefPedCrit	-.031	-.063	1.000
	TaskExPedCrit	.007	-.021	.185
	FreqPedCrit	.032	.039	.031
	ExpPedCrit	-.012	.019	-.016
Sig. (1-tailed)	Pedagogy	.001	.056	.000
	Course_PedStrat_Crit	.001	.001	.169
	SettingPedCrit	.000	.434	.011
	TypePedCrit	.000	.096	.197
	SESPedCrit	.	.000	.199
	ClassEthPedCrit	.000	.	.045
	SynthDefPedCrit	.199	.045	.
	TaskExPedCrit	.426	.287	.000
	FreqPedCrit	.197	.147	.199
	ExpPedCrit	.372	.300	.330
N	Pedagogy	733	733	733
	Course_PedStrat_Crit	733	733	733
	SettingPedCrit	733	733	733
	TypePedCrit	733	733	733
	SESPedCrit	733	733	733
	ClassEthPedCrit	733	733	733
	SynthDefPedCrit	733	733	733
	TaskExPedCrit	733	733	733
	FreqPedCrit	733	733	733
	ExpPedCrit	733	733	733

Table H18

Correlations

		TaskExPedCrit	FreqPedCrit	ExpPedCrit
Pearson Correlation	Pedagogy	.107	.047	.083
	Course_PedStrat_Crit	.071	.048	-.036
	SettingPedCrit	.016	.080	.002
	TypePedCrit	.052	.008	-.002
	SESPedCrit	.007	.032	-.012
	ClassEthPedCrit	-.021	.039	.019
	SynthDefPedCrit	.185	.031	-.016
	TaskExPedCrit	1.000	-.019	.045
	FreqPedCrit	-.019	1.000	-.108
	ExpPedCrit	.045	-.108	1.000
Sig. (1-tailed)	Pedagogy	.002	.104	.013
	Course_PedStrat_Crit	.028	.096	.167
	SettingPedCrit	.328	.016	.481
	TypePedCrit	.079	.410	.482
	SESPedCrit	.426	.197	.372
	ClassEthPedCrit	.287	.147	.300
	SynthDefPedCrit	.000	.199	.330
	TaskExPedCrit	.	.302	.111
	FreqPedCrit	.302	.	.002
	ExpPedCrit	.111	.002	.
N	Pedagogy	733	733	733
	Course_PedStrat_Crit	733	733	733
	SettingPedCrit	733	733	733
	TypePedCrit	733	733	733
	SESPedCrit	733	733	733
	ClassEthPedCrit	733	733	733
	SynthDefPedCrit	733	733	733
	TaskExPedCrit	733	733	733
	FreqPedCrit	733	733	733
	ExpPedCrit	733	733	733

Table H19

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, SettingPedCrit, Course_PedStrat_Crit, TaskExPedCrit, SESPedCrit[b]	.	Enter
2	.	SettingPedCrit	Backward (criterion: Probability of F-to-remove >= .100).
3	.	SESPedCrit	Backward (criterion: Probability of F-to-remove >= .100).
4	.	FreqPedCrit	Backward (criterion: Probability of F-to-remove >= .100).
5	.	ClassEthPedCrit	Backward (criterion: Probability of F-to-remove >= .100).

a. Dependent Variable: Pedagogy
b. All requested variables entered.

Table H20

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.293[a]	.086	.075	.42764	.086	7.551	9
2	.292[b]	.085	.075	.42748	-.001	.446	1
3	.290[c]	.084	.075	.42749	-.001	1.039	1
4	.287[d]	.082	.075	.42762	-.002	1.450	1
5	.281[e]	.079	.073	.42805	-.003	2.462	1

Table H21

Model Summary

Model	Change Statistics	
	df2	Sig. F Change
1	723[a]	.000
2	723[b]	.504
3	724[c]	.308
4	725[d]	.229
5	726[e]	.117

a. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, SettingPedCrit, Course_PedStrat_Crit, TaskExPedCrit, SESPedCrit
b. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, Course_PedStrat_Crit, TaskExPedCrit, SESPedCrit
c. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, Course_PedStrat_Crit, TaskExPedCrit

d. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, Course_PedStrat_Crit, TaskExPedCrit
e. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, Course_PedStrat_Crit, TaskExPedCrit

Table H22

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.428	9	1.381	7.551	.000[b]
	Residual	132.221	723	.183		
	Total	144.649	732			
2	Regression	12.347	8	1.543	8.446	.000[c]
	Residual	132.303	724	.183		
	Total	144.649	732			
3	Regression	12.157	7	1.737	9.503	.000[d]
	Residual	132.492	725	.183		
	Total	144.649	732			
4	Regression	11.892	6	1.982	10.839	.000[e]
	Residual	132.757	726	.183		
	Total	144.649	732			
5	Regression	11.442	5	2.288	12.489	.000[f]
	Residual	133.207	727	.183		
	Total	144.649	732			

a. Dependent Variable: Pedagogy
b. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, SettingPedCrit, Course_PedStrat_Crit, TaskExPedCrit, SESPedCrit
c. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, Course_PedStrat_Crit, TaskExPedCrit, SESPedCrit
d. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, Course_PedStrat_Crit, TaskExPedCrit
e. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, Course_PedStrat_Crit, TaskExPedCrit
f. Predictors: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, Course_PedStrat_Crit, TaskExPedCrit

Table H23

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-17.898	4.264		-4.198	.000
	Course_PedStrat_Crit	.937	.234	.145	4.010	.000
	SettingPedCrit	.656	.983	.024	.668	.504
	TypePedCrit	.825	.239	.133	3.444	.001
	SESPedCrit	.295	.312	.037	.943	.346
	ClassEthPedCrit	.746	.578	.048	1.292	.197
	SynthDefPedCrit	1.004	.282	.130	3.563	.000
	TaskExPedCrit	.513	.300	.062	1.712	.087
	FreqPedCrit	.503	.447	.041	1.126	.261
	ExpPedCrit	1.284	.504	.091	2.547	.011
2	(Constant)	-15.955	3.117		-5.118	.000
	Course_PedStrat_Crit	.934	.233	.145	4.000	.000
	TypePedCrit	.831	.239	.134	3.477	.001
	SESPedCrit	.316	.310	.040	1.019	.308
	ClassEthPedCrit	.734	.577	.047	1.272	.204
	SynthDefPedCrit	.987	.281	.128	3.518	.000
	TaskExPedCrit	.520	.299	.063	1.735	.083
	FreqPedCrit	.528	.445	.042	1.185	.236
	ExpPedCrit	1.287	.504	.092	2.554	.011
3	(Constant)	-15.680	3.106		-5.049	.000
	Course_PedStrat_Crit	.949	.233	.147	4.073	.000
	TypePedCrit	.922	.222	.149	4.154	.000
	ClassEthPedCrit	.859	.564	.055	1.522	.128
	SynthDefPedCrit	.986	.281	.128	3.514	.000
	TaskExPedCrit	.516	.299	.063	1.723	.085
	FreqPedCrit	.536	.445	.043	1.204	.229
	ExpPedCrit	1.281	.504	.091	2.542	.011
4	(Constant)	-13.953	2.755		-5.064	.000
	Course_PedStrat_Crit	.961	.233	.149	4.125	.000
	TypePedCrit	.924	.222	.149	4.163	.000
	ClassEthPedCrit	.885	.564	.056	1.569	.117
	SynthDefPedCrit	.999	.280	.129	3.561	.000
	TaskExPedCrit	.507	.299	.062	1.695	.091
	ExpPedCrit	1.217	.501	.087	2.427	.015
5	(Constant)	-11.233	2.144		-5.240	.000
	Course_PedStrat_Crit	1.005	.231	.156	4.345	.000
	TypePedCrit	.903	.222	.146	4.070	.000
	SynthDefPedCrit	.974	.280	.126	3.474	.001
	TaskExPedCrit	.500	.300	.061	1.667	.096
	ExpPedCrit	1.235	.502	.088	2.463	.014

a. Dependent Variable: Pedagogy

Table H24

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	SettingPedCrit	.024[b]	.668	.504	.025	.966
3	SettingPedCrit	.028[c]	.771	.441	.029	.977
	SESPedCrit	.040[c]	1.019	.308	.038	.822
4	SettingPedCrit	.031[d]	.869	.385	.032	.984
	SESPedCrit	.041[d]	1.041	.298	.039	.822
	FreqPedCrit	.043[d]	1.204	.229	.045	.983
5	SettingPedCrit	.031[e]	.859	.390	.032	.984
	SESPedCrit	.052[e]	1.350	.177	.050	.861
	FreqPedCrit	.045[e]	1.262	.207	.047	.985
	ClassEthPedCrit	.056[e]	1.569	.117	.058	.978

a. Dependent Variable: Pedagogy
b. Predictors in the Model: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, Course_PedStrat_Crit, TaskExPedCrit, SESPedCrit
c. Predictors in the Model: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, FreqPedCrit, Course_PedStrat_Crit, TaskExPedCrit
d. Predictors in the Model: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, ClassEthPedCrit, Course_PedStrat_Crit, TaskExPedCrit
e. Predictors in the Model: (Constant), ExpPedCrit, TypePedCrit, SynthDefPedCrit, Course_PedStrat_Crit, TaskExPedCrit

ANOVA: ELA course type and frequency of use of pedagogical strategies

Table H25

Descriptives

Pedagogy

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
					Lower Bound
AP English Language	232	3.0395	.45133	.02963	2.9811
AP English Literature	76	3.0950	.44248	.05076	2.9939
IB English	34	3.0882	.49372	.08467	2.9160
Dual credit	22	3.3283	.47696	.10169	3.1168
ELL	21	3.2857	.49263	.10750	3.0615
Honors	145	3.1504	.42744	.03550	3.0802
College prep	165	3.1021	.43698	.03402	3.0349
Regular English	150	3.0709	.47560	.03883	2.9942
Other English	29	3.2797	.47663	.08851	3.0984
Total	874	3.1030	.45566	.01541	3.0727

Table H26

Descriptives

Pedagogy

	95% Confidence Interval for Mean	Minimum	Maximum
	Upper Bound		
AP English Language	3.0978	1.56	4.00
AP English Literature	3.1961	1.67	4.00
IB English	3.2605	1.78	4.00
Dual credit	3.5398	2.11	4.00
ELL	3.5100	2.44	4.00
Honors	3.2205	2.00	4.00
College prep	3.1693	2.00	4.00
Regular English	3.1476	2.00	4.00
Other English	3.4610	2.33	4.00
Total	3.1332	1.56	4.00

Table H27

ANOVA

Pedagogy

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.152	8	.519	2.535	.010
Within Groups	177.103	865	.205		
Total	181.255	873			

Post Hoc Tests

Table H28

Multiple Comparisons
Dependent Variable: Pedagogy
Tukey HSD

(I) Type of course	(J) Type of course	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
AP English Language	AP English Literature	-.05558	.05980	.991	-.2415	.1304
	IB English	-.04878	.08309	1.000	-.3072	.2096
	Dual credit	-.28883	.10094	.100	-.6027	.0251
	ELL	-.24626	.10311	.292	-.5669	.0744
	Honors	-.11093	.04790	.334	-.2599	.0380
	College prep	-.06265	.04608	.912	-.2059	.0806
	Regular English	-.03146	.04741	.999	-.1789	.1160
	Other English	-.24024	.08912	.151	-.5174	.0369
AP English Literature	AP English Language	.05558	.05980	.991	-.1304	.2415
	IB English	.00679	.09336	1.000	-.2835	.2971
	Dual credit	-.23325	.10955	.454	-.5739	.1074
	ELL	-.19069	.11155	.741	-.5376	.1562
	Honors	-.05535	.06408	.995	-.2546	.1439
	College prep	-.00708	.06273	1.000	-.2021	.1880
	Regular English	.02412	.06371	1.000	-.1740	.2222

(I) Type of course	(J) Type of course	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Other English	-.18466	.09876	.635	-.4918	.1225
IB English	AP English Language	.04878	.08309	1.000	-.2096	.3072
	AP English Literature	-.00679	.09336	1.000	-.2971	.2835
	Dual credit	-.24005	.12381	.587	-.6250	.1450
	ELL	-.19748	.12558	.820	-.5880	.1930
	Honors	-.06215	.08622	.999	-.3303	.2060
	College prep	-.01387	.08522	1.000	-.2789	.2511
	Regular English	.01732	.08595	1.000	-.2499	.2846
	Other English	-.19146	.11438	.762	-.5471	.1642
Dual credit	AP English Language	.28883	.10094	.100	-.0251	.6027
	AP English Literature	.23325	.10955	.454	-.1074	.5739
	IB English	.24005	.12381	.587	-.1450	.6250
	ELL	.04257	.13804	1.000	-.3867	.4718
	Honors	.17790	.10353	.735	-.1440	.4998
	College prep	.22618	.10270	.405	-.0932	.5455
	Regular English	.25737	.10330	.237	-.0639	.5786
	Other English	.04859	.12793	1.000	-.3492	.4464
ELL	AP English Language	.24626	.10311	.292	-.0744	.5669
	AP English Literature	.19069	.11155	.741	-.1562	.5376
	IB English	.19748	.12558	.820	-.1930	.5880
	Dual credit	-.04257	.13804	1.000	-.4718	.3867
	Honors	.13533	.10565	.937	-.1932	.4639
	College prep	.18361	.10484	.714	-.1424	.5096
	Regular English	.21480	.10543	.517	-.1130	.5426
	Other English	.00602	.12965	1.000	-.3972	.4092
Honors	AP English Language	.11093	.04790	.334	-.0380	.2599
	AP English Literature	.05535	.06408	.995	-.1439	.2546
	IB English	.06215	.08622	.999	-.2060	.3303
	Dual credit	-.17790	.10353	.735	-.4998	.1440
	ELL	-.13533	.10565	.937	-.4639	.1932
	College prep	.04828	.05151	.991	-.1119	.2084
	Regular English	.07947	.05270	.852	-.0844	.2433
	Other English	-.12931	.09204	.896	-.4155	.1569
College prep	AP English Language	.06265	.04608	.912	-.0806	.2059
	AP English Literature	.00708	.06273	1.000	-.1880	.2021
	IB English	.01387	.08522	1.000	-.2511	.2789
	Dual credit	-.22618	.10270	.405	-.5455	.0932
	ELL	-.18361	.10484	.714	-.5096	.1424
	Honors	-.04828	.05151	.991	-.2084	.1119
	Regular English	.03119	.05105	1.000	-.1275	.1899
	Other English	-.17759	.09111	.580	-.4609	.1057

(I) Type of course	(J) Type of course	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Regular English	AP English Language	.03146	.04741	.999	-.1160	.1789
	AP English Literature	-.02412	.06371	1.000	-.2222	.1740
	IB English	-.01732	.08595	1.000	-.2846	.2499
	Dual credit	-.25737	.10330	.237	-.5786	.0639
	ELL	-.21480	.10543	.517	-.5426	.1130
	Honors	-.07947	.05270	.852	-.2433	.0844
	College prep	-.03119	.05105	1.000	-.1899	.1275
	Other English	-.20878	.09179	.359	-.4942	.0766
Other English	AP English Language	.24024	.08912	.151	-.0369	.5174
	AP English Literature	.18466	.09876	.635	-.1225	.4918
	IB English	.19146	.11438	.762	-.1642	.5471
	Dual credit	-.04859	.12793	1.000	-.4464	.3492
	ELL	-.00602	.12965	1.000	-.4092	.3972
	Honors	.12931	.09204	.896	-.1569	.4155
	College prep	.17759	.09111	.580	-.1057	.4609
	Regular English	.20878	.09179	.359	-.0766	.4942

Homogeneous Subsets

Table H29

Pedagogy

Tukey HSD[a,b]

Type of course	N	Subset for alpha = 0.05
		1
AP English Language	232	3.0395
Regular English	150	3.0709
IB English	34	3.0882
AP English Literature	76	3.0950
College prep	165	3.1021
Honors	145	3.1504
Other English	29	3.2797
ELL	21	3.2857
Dual credit	22	3.3283
Sig.		.056

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 46.377.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

ANOVA: School type and frequency of use of pedagogical strategies

Oneway

Table H30

Descriptives

Pedagogy

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Conventional public	601	3.1435	.44870	.01830	3.1075	3.1794
Public charter	20	3.1278	.33094	.07400	2.9729	3.2827
Public magnet	33	3.1246	.47366	.08245	2.9566	3.2925
Independent	82	3.0024	.46857	.05175	2.8994	3.1053
Parochial	77	2.9187	.45500	.05185	2.8154	3.0219
Boarding/other	20	3.0444	.50520	.11297	2.8080	3.2809
Total	833	3.1053	.45593	.01580	3.0743	3.1363

Table H31

Descriptives

Pedagogy

	Minimum	Maximum
Conventional public	2.00	4.00
Public charter	2.44	3.78
Public magnet	2.00	4.00
Independent	1.56	4.00
Parochial	1.67	3.78
Boarding/other	2.33	4.00
Total	1.56	4.00

Table H32

ANOVA

Pedagogy

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.524	5	.905	4.443	.001
Within Groups	168.426	827	.204		
Total	172.950	832			

Post Hoc Tests

Table H33

Multiple Comparisons

Dependent Variable: Pedagogy

Tukey HSD

(I) Type of school	(J) Type of school	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
Conventional public	Public charter	.01571	.10258	1.000	-.2773
	Public magnet	.01891	.08069	1.000	-.2116
	Independent	.14111	.05313	.085	-.0106
	Parochial	.22483*	.05462	.001	.0688
	Boarding/other	.09904	.10258	.929	-.1940
Public charter	Conventional public	-.01571	.10258	1.000	-.3087
	Public magnet	.00320	.12788	1.000	-.3621
	Independent	.12541	.11255	.876	-.1961
	Parochial	.20913	.11326	.436	-.1144
	Boarding/other	.08333	.14271	.992	-.3243
Public magnet	Conventional public	-.01891	.08069	1.000	-.2494
	Public charter	-.00320	.12788	1.000	-.3685
	Independent	.12221	.09303	.778	-.1435
	Parochial	.20593	.09390	.242	-.0623
	Boarding/other	.08013	.12788	.989	-.2852
Independent	Conventional public	-.14111	.05313	.085	-.2929
	Public charter	-.12541	.11255	.876	-.4469
	Public magnet	-.12221	.09303	.778	-.3879
	Parochial	.08372	.07161	.852	-.1208
	Boarding/other	-.04207	.11255	.999	-.3636
Parochial	Conventional public	-.22483*	.05462	.001	-.3809
	Public charter	-.20913	.11326	.436	-.5326
	Public magnet	-.20593	.09390	.242	-.4741
	Independent	-.08372	.07161	.852	-.2883
	Boarding/other	-.12579	.11326	.877	-.4493
Boarding/other	Conventional public	-.09904	.10258	.929	-.3920
	Public charter	-.08333	.14271	.992	-.4910
	Public magnet	-.08013	.12788	.989	-.4454
	Independent	.04207	.11255	.999	-.2794
	Parochial	.12579	.11326	.877	-.1977

Table H34

Multiple Comparisons

Dependent Variable: Pedagogy

Tukey HSD

(I) Type of school	(J) Type of school	95% Confidence Interval
		Upper Bound
Conventional public	Public charter	.3087
	Public magnet	.2494
	Independent	.2929
	Parochial	.3809*
	Boarding/other	.3920
Public charter	Conventional public	.2773
	Public magnet	.3685
	Independent	.4469
	Parochial	.5326
	Boarding/other	.4910
Public magnet	Conventional public	.2116
	Public charter	.3621
	Independent	.3879
	Parochial	.4741
	Boarding/other	.4454
Independent	Conventional public	.0106
	Public charter	.1961
	Public magnet	.1435
	Parochial	.2883
	Boarding/other	.2794
Parochial	Conventional public	-.0688*
	Public charter	.1144
	Public magnet	.0623
	Independent	.1208
	Boarding/other	.1977
Boarding/other	Conventional public	.1940
	Public charter	.3243
	Public magnet	.2852
	Independent	.3636
	Parochial	.4493

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Table H35

Pedagogy

Tukey HSD[a,b]

Type of school	N	Subset for alpha = 0.05
		1
Parochial	77	2.9187
Independent	82	3.0024
Boarding/other	20	3.0444
Public magnet	33	3.1246
Public charter	20	3.1278
Conventional public	601	3.1435
Sig.		.250

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 38.180.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

ANOVA: Years teaching experience and frequency of use of pedagogical strategies

Oneway

Table H36

Descriptives

Pedagogy

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum
					Lower Bound	Upper Bound	
<= 5	106	3.0954	.47126	.04577	3.0046	3.1861	1.56
6 - 10	187	3.0818	.44460	.03251	3.0176	3.1459	2.11
11 - 15	170	3.1072	.45047	.03455	3.0390	3.1754	2.00
16 - 20	122	3.1571	.47889	.04336	3.0713	3.2429	2.00
21 - 25	88	3.1528	.43290	.04615	3.0611	3.2445	2.00
26 - 30	72	3.0804	.49501	.05834	2.9641	3.1968	1.67
31+	89	3.0649	.43048	.04563	2.9742	3.1556	2.11
Total	834	3.1053	.45568	.01578	3.0743	3.1363	1.56

Table H37

Descriptives

Pedagogy

	Maximum
<= 5	4.00
6 - 10	4.00
11 - 15	4.00
16 - 20	4.00
21 - 25	4.00
26 - 30	4.00
31+	4.00
Total	4.00

Table H38

ANOVA

Pedagogy

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.830	6	.138	.665	.678
Within Groups	172.139	827	.208		
Total	172.969	833			

Post Hoc Tests

Table H39

Multiple Comparisons

Dependent Variable: Pedagogy
Tukey HSD

(I) Years teaching experience (Binned)	(J) Years teaching experience (Binned)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
<= 5	6 - 10	.01361	.05547	1.000	-.1503	.1776
	11 - 15	-.01180	.05646	1.000	-.1787	.1551
	16 - 20	-.06172	.06058	.950	-.2408	.1173
	21 - 25	-.05739	.06580	.977	-.2519	.1371
	26 - 30	.01495	.06968	1.000	-.1910	.2209
	31+	.03049	.06559	.999	-.1634	.2244
6 - 10	<= 5	-.01361	.05547	1.000	-.1776	.1503
	11 - 15	-.02542	.04835	.998	-.1683	.1175
	16 - 20	-.07533	.05310	.792	-.2323	.0816
	21 - 25	-.07100	.05898	.893	-.2453	.1033
	26 - 30	.00133	.06328	1.000	-.1857	.1884
	31+	.01688	.05875	1.000	-.1568	.1905
11 - 15	<= 5	.01180	.05646	1.000	-.1551	.1787
	6 - 10	.02542	.04835	.998	-.1175	.1683
	16 - 20	-.04991	.05413	.969	-.2099	.1101
	21 - 25	-.04559	.05991	.988	-.2227	.1315
	26 - 30	.02675	.06415	1.000	-.1629	.2164
	31+	.04229	.05969	.992	-.1341	.2187
16 - 20	<= 5	.06172	.06058	.950	-.1173	.2408
	6 - 10	.07533	.05310	.792	-.0816	.2323
	11 - 15	.04991	.05413	.969	-.1101	.2099
	21 - 25	.00433	.06381	1.000	-.1843	.1929
	26 - 30	.07666	.06780	.919	-.1237	.2771
	31+	.09221	.06360	.774	-.0958	.2802
21 - 25	<= 5	.05739	.06580	.977	-.1371	.2519
	6 - 10	.07100	.05898	.893	-.1033	.2453
	11 - 15	.04559	.05991	.988	-.1315	.2227
	16 - 20	-.00433	.06381	1.000	-.1929	.1843
	26 - 30	.07234	.07250	.954	-.1419	.2866
	31+	.08788	.06859	.861	-.1148	.2906
26 - 30	<= 5	-.01495	.06968	1.000	-.2209	.1910
	6 - 10	-.00133	.06328	1.000	-.1884	.1857
	11 - 15	-.02675	.06415	1.000	-.2164	.1629
	16 - 20	-.07666	.06780	.919	-.2771	.1237
	21 - 25	-.07234	.07250	.954	-.2866	.1419
	31+	.01554	.07232	1.000	-.1982	.2293
31+	<= 5	-.03049	.06559	.999	-.2244	.1634
	6 - 10	-.01688	.05875	1.000	-.1905	.1568
	11 - 15	-.04229	.05969	.992	-.2187	.1341
	16 - 20	-.09221	.06360	.774	-.2802	.0958
	21 - 25	-.08788	.06859	.861	-.2906	.1148
	26 - 30	-.01554	.07232	1.000	-.2293	.1982

Homogeneous Subsets

Table H40

Pedagogy

Tukey HSD[a,b]

Years teaching experience (Binned)	N	Subset for alpha = 0.05
		1
31+	89	3.0649
26 - 30	72	3.0804
6 - 10	187	3.0818
<= 5	106	3.0954
11 - 15	170	3.1072
21 - 25	88	3.1528
16 - 20	122	3.1571
Sig.		.757

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 107.117.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

ANOVA: Synthesis definition and frequency of use of pedagogical strategies

Oneway

Table H41

Descriptives

Pedagogy

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
					Lower Bound
Prompt response	63	3.0077	.42922	.05408	2.8996
Original argument/thesis	192	3.1221	.40761	.02942	3.0641
Original perspective/analysis	89	3.0808	.49732	.05272	2.9761
Connecting to texts/topics	42	3.1005	.42844	.06611	2.9670
Summary	19	3.3070	.44567	.10224	3.0922
Analysis of themes/ideas	31	3.1470	.45487	.08170	2.9801
Literary analysis	22	3.2525	.48150	.10266	3.0390
Literary argument	3	3.2222	.50918	.29397	1.9574
Composition support	162	3.1357	.43284	.03401	3.0686
No synthesis	112	3.0501	.53104	.05018	2.9507
Rhetorical analysis	5	3.2222	.33333	.14907	2.8083
Argument	73	3.1218	.43199	.05056	3.0210
Total	813	3.1102	.45157	.01584	3.0791

Table H42

Descriptives

Pedagogy

	95% Confidence Interval for Mean	Minimum	Maximum
	Upper Bound		
Prompt response	3.1158	1.56	4.00
Original argument/thesis	3.1801	2.11	4.00
Original perspective/analysis	3.1856	2.00	4.00
Connecting to texts/topics	3.2340	2.22	4.00
Summary	3.5218	2.44	4.00
Analysis of themes/ideas	3.3138	2.00	4.00
Literary analysis	3.4660	2.11	4.00
Literary argument	4.4871	2.67	3.67
Composition support	3.2029	2.00	4.00
No synthesis	3.1495	1.67	4.00
Rhetorical analysis	3.6361	2.78	3.56
Argument	3.2226	2.22	4.00
Total	3.1412	1.56	4.00

Table H43

ANOVA

Pedagogy

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.613	11	.238	1.168	.306
Within Groups	162.963	801	.203		
Total	165.576	812			

Post Hoc Tests

Table H44

Multiple Comparisons
Dependent Variable: Pedagogy
Tukey HSD

(I) Teacher's synthesis definition	(J) Teacher's synthesis definition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Prompt response	Original argument/thesis	-.11438	.06549	.846	-.3290	.1003
	Original perspective/analysis	-.07312	.07427	.998	-.3165	.1703
	Connecting to texts/topics	-.09281	.08985	.997	-.3873	.2017
	Summary	-.29930	.11806	.319	-.6863	.0877
	Analysis of themes/ideas	-.13924	.09896	.962	-.4636	.1851
	Literary analysis	-.24481	.11170	.556	-.6109	.1213
	Literary argument	-.21451	.26654	1.000	-1.0882	.6592
	Composition support	-.12800	.06697	.752	-.3475	.0915
	No synthesis	-.04238	.07103	1.000	-.2752	.1905
	Rhetorical analysis	-.21451	.20957	.997	-.9014	.4724
	Argument	-.11405	.07756	.948	-.3683	.1402
Original argument/thesis	Prompt response	.11438	.06549	.846	-.1003	.3290
	Original perspective/analysis	.04126	.05784	1.000	-.1483	.2308
	Connecting to texts/topics	.02157	.07684	1.000	-.2303	.2734
	Summary	-.18492	.10848	.866	-.5405	.1706
	Analysis of themes/ideas	-.02486	.08731	1.000	-.3110	.2613
	Literary analysis	-.13043	.10152	.981	-.4632	.2023
	Literary argument	-.10013	.26244	1.000	-.9604	.7601
	Composition support	-.01362	.04812	1.000	-.1713	.1441
	No synthesis	.07200	.05363	.973	-.1038	.2478
	Rhetorical analysis	-.10013	.20433	1.000	-.7699	.5696
	Argument	.00033	.06202	1.000	-.2030	.2036
Original perspective/analysis	Prompt response	.07312	.07427	.998	-.1703	.3165
	Original argument/thesis	-.04126	.05784	1.000	-.2308	.1483
	Connecting to texts/topics	-.01969	.08444	1.000	-.2965	.2571
	Summary	-.22618	.11399	.704	-.5998	.1475
	Analysis of themes/ideas	-.06612	.09407	1.000	-.3745	.2422
	Literary analysis	-.17169	.10739	.909	-.5237	.1803
	Literary argument	-.14139	.26477	1.000	-1.0092	.7265
	Composition support	-.05488	.05951	.999	-.2500	.1402
	No synthesis	.03074	.06405	1.000	-.1792	.2407
	Rhetorical analysis	-.14139	.20731	1.000	-.8209	.5381
	Argument	-.04093	.07122	1.000	-.2744	.1925

(I) Teacher's synthesis definition	(J) Teacher's synthesis definition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Connecting to texts/topics	Prompt response	.09281	.08985	.997	-.2017	.3873
	Original argument/thesis	-.02157	.07684	1.000	-.2734	.2303
	Original perspective/analysis	.01969	.08444	1.000	-.2571	.2965
	Summary	-.20649	.12471	.887	-.6152	.2023
	Analysis of themes/ideas	-.04642	.10680	1.000	-.3965	.3037
	Literary analysis	-.15200	.11871	.981	-.5411	.2371
	Literary argument	-.12169	.26956	1.000	-1.0052	.7618
	Composition support	-.03519	.07810	1.000	-.2912	.2208
	No synthesis	.05043	.08161	1.000	-.2171	.3179
	Rhetorical analysis	-.12169	.21339	1.000	-.8211	.5777
	Argument	-.02124	.08736	1.000	-.3076	.2651
Summary	Prompt response	.29930	.11806	.319	-.0877	.6863
	Original argument/thesis	.18492	.10848	.866	-.1706	.5405
	Original perspective/analysis	.22618	.11399	.704	-.1475	.5998
	Connecting to texts/topics	.20649	.12471	.887	-.2023	.6152
	Analysis of themes/ideas	.16006	.13142	.988	-.2707	.5908
	Literary analysis	.05449	.14126	1.000	-.4085	.5175
	Literary argument	.08480	.28022	1.000	-.8337	1.0033
	Composition support	.17130	.10938	.921	-.1872	.5298
	No synthesis	.25692	.11191	.480	-.1099	.6237
	Rhetorical analysis	.08480	.22671	1.000	-.6583	.8279
	Argument	.18525	.11617	.911	-.1955	.5660
Analysis of themes/ideas	Prompt response	.13924	.09896	.962	-.1851	.4636
	Original argument/thesis	.02486	.08731	1.000	-.2613	.3110
	Original perspective/analysis	.06612	.09407	1.000	-.2422	.3745
	Connecting to texts/topics	.04642	.10680	1.000	-.3037	.3965
	Summary	-.16006	.13142	.988	-.5908	.2707
	Literary analysis	-.10557	.12574	1.000	-.5177	.3066
	Literary argument	-.07527	.27273	1.000	-.9692	.8187
	Composition support	.01124	.08842	1.000	-.2786	.3011
	No synthesis	.09685	.09154	.996	-.2032	.3969
	Rhetorical analysis	-.07527	.21738	1.000	-.7878	.6372
	Argument	.02519	.09669	1.000	-.2918	.3421
Literary analysis	Prompt response	.24481	.11170	.556	-.1213	.6109
	Original argument/thesis	.13043	.10152	.981	-.2023	.4632
	Original perspective/analysis	.17169	.10739	.909	-.1803	.5237
	Connecting to texts/topics	.15200	.11871	.981	-.2371	.5411
	Summary	-.05449	.14126	1.000	-.5175	.4085

(I) Teacher's synthesis definition	(J) Teacher's synthesis definition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Analysis of themes/ideas	.10557	.12574	1.000	-.3066	.5177
	Literary argument	.03030	.27760	1.000	-.8796	.9402
	Composition support	.11681	.10249	.993	-.2191	.4527
	No synthesis	.20243	.10519	.744	-.1424	.5472
	Rhetorical analysis	.03030	.22347	1.000	-.7022	.7628
	Argument	.13076	.10970	.990	-.2288	.4903
Literary argument	Prompt response	.21451	.26654	1.000	-.6592	1.0882
	Original argument/thesis	.10013	.26244	1.000	-.7601	.9604
	Original perspective/analysis	.14139	.26477	1.000	-.7265	1.0092
	Connecting to texts/topics	.12169	.26956	1.000	-.7618	1.0052
	Summary	-.08480	.28022	1.000	-1.0033	.8337
	Analysis of themes/ideas	.07527	.27273	1.000	-.8187	.9692
	Literary analysis	-.03030	.27760	1.000	-.9402	.8796
	Composition support	.08651	.26282	1.000	-.7749	.9480
	No synthesis	.17212	.26388	1.000	-.6928	1.0371
	Rhetorical analysis	.00000	.32940	1.000	-1.0797	1.0797
	Argument	.10046	.26571	1.000	-.7705	.9714
Composition support	Prompt response	.12800	.06697	.752	-.0915	.3475
	Original argument/thesis	.01362	.04812	1.000	-.1441	.1713
	Original perspective/analysis	.05488	.05951	.999	-.1402	.2500
	Connecting to texts/topics	.03519	.07810	1.000	-.2208	.2912
	Summary	-.17130	.10938	.921	-.5298	.1872
	Analysis of themes/ideas	-.01124	.08842	1.000	-.3011	.2786
	Literary analysis	-.11681	.10249	.993	-.4527	.2191
	Literary argument	-.08651	.26282	1.000	-.9480	.7749
	No synthesis	.08562	.05543	.928	-.0961	.2673
	Rhetorical analysis	-.08651	.20481	1.000	-.7578	.5848
	Argument	.01395	.06358	1.000	-.1945	.2224
No synthesis	Prompt response	.04238	.07103	1.000	-.1905	.2752
	Original argument/thesis	-.07200	.05363	.973	-.2478	.1038
	Original perspective/analysis	-.03074	.06405	1.000	-.2407	.1792
	Connecting to texts/topics	-.05043	.08161	1.000	-.3179	.2171
	Summary	-.25692	.11191	.480	-.6237	.1099
	Analysis of themes/ideas	-.09685	.09154	.996	-.3969	.2032
	Literary analysis	-.20243	.10519	.744	-.5472	.1424
	Literary argument	-.17212	.26388	1.000	-1.0371	.6928
	Composition support	-.08562	.05543	.928	-.2673	.0961
	Rhetorical analysis	-.17212	.20617	1.000	-.8479	.5037

(I) Teacher's synthesis definition	(J) Teacher's synthesis definition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	Argument	-.07167	.06785	.996	-.2941	.1507
Rhetorical analysis	Prompt response	.21451	.20957	.997	-.4724	.9014
	Original argument/thesis	.10013	.20433	1.000	-.5696	.7699
	Original perspective/analysis	.14139	.20731	1.000	-.5381	.8209
	Connecting to texts/topics	.12169	.21339	1.000	-.5777	.8211
	Summary	-.08480	.22671	1.000	-.8279	.6583
	Analysis of themes/ideas	.07527	.21738	1.000	-.6372	.7878
	Literary analysis	-.03030	.22347	1.000	-.7628	.7022
	Literary argument	.00000	.32940	1.000	-1.0797	1.0797
	Composition support	.08651	.20481	1.000	-.5848	.7578
	No synthesis	.17212	.20617	1.000	-.5037	.8479
	Argument	.10046	.20851	1.000	-.5830	.7839
Argument	Prompt response	.11405	.07756	.948	-.1402	.3683
	Original argument/thesis	-.00033	.06202	1.000	-.2036	.2030
	Original perspective/analysis	.04093	.07122	1.000	-.1925	.2744
	Connecting to texts/topics	.02124	.08736	1.000	-.2651	.3076
	Summary	-.18525	.11617	.911	-.5660	.1955
	Analysis of themes/ideas	-.02519	.09669	1.000	-.3421	.2918
	Literary analysis	-.13076	.10970	.990	-.4903	.2288
	Literary argument	-.10046	.26571	1.000	-.9714	.7705
	Composition support	-.01395	.06358	1.000	-.2224	.1945
	No synthesis	.07167	.06785	.996	-.1507	.2941
	Rhetorical analysis	-.10046	.20851	1.000	-.7839	.5830

Homogeneous Subsets

Table H45

Pedagogy

Tukey HSD[a,b]

Teacher's synthesis definition	N	Subset for alpha = 0.05
		1
Prompt response	63	3.0077
No synthesis	112	3.0501
Original perspective/analysis	89	3.0808
Connecting to texts/topics	42	3.1005
Argument	73	3.1218
Original argument/thesis	192	3.1221
Composition support	162	3.1357
Analysis of themes/ideas	31	3.1470
Literary argument	3	3.2222
Rhetorical analysis	5	3.2222
Literary analysis	22	3.2525
Summary	19	3.3070
Sig.		.772

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 16.030.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Appendix I

Professional Development

Table I1

COS synthesis requirement and state

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	94.710[a]	74	.053
Likelihood Ratio	96.698	74	.039
Linear-by-Linear Association	.145	1	.704
N of Valid Cases	844		

a. 72 cells (63.2%) have expected count less than 5. The minimum expected count is .21.

Table I2

COS synthesis requirement and instructional setting

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.426[a]	4	.115
Likelihood Ratio	7.446	4	.114
Linear-by-Linear Association	5.740	1	.017
N of Valid Cases	852		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.98.

Table I3

COS synthesis requirement and course type

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.293[a]	16	.791
Likelihood Ratio	11.201	16	.797
Linear-by-Linear Association	.533	1	.465
N of Valid Cases	890		

a. 2 cells (7.4%) have expected count less than 5. The minimum expected count is 4.55.

Table I4

COS synthesis requirement and percent nonwhite students in course

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.344[a]	8	.183
Likelihood Ratio	11.252	8	.188
Linear-by-Linear Association	3.682	1	.055
N of Valid Cases	851		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.24.

Table I5

COS synthesis requirement and years teaching experience

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.082[a]	12	.113
Likelihood Ratio	17.868	12	.120
Linear-by-Linear Association	2.824	1	.093
N of Valid Cases	853		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.23.

Table I6

COS synthesis requirement and school type

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Synthesis writing in state COS * Type of school	852	70.0%	365	30.0%	1217	100.0%

Table I7

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	142.886[a]	12	.000
Likelihood Ratio	125.135	12	.000
Linear-by-Linear Association	54.352	1	.000
N of Valid Cases	852		

a. 6 cells (28.6%) have expected count less than 5. The minimum expected count is 2.08.

Table I8

			Type of school							Total
			Conventional public	Public charter	Public magnet	Independent	Parochial	Boarding	Other	
Synthesis writing in state COS	Yes	Count	380_{a}	15_{a}	23_{a}	22_{b}	31_{c}	$2_{b, c}$	8_{a}	481
		Expected Count	347.2	11.3	18.1	49.7	43.5	5.6	5.6	481.0
		% within Synthesis writing in state COS	79.0%	3.1%	4.8%	4.6%	6.4%	0.4%	1.7%	100.0%
		% within Type of school	61.8%	75.0%	71.9%	25.0%	40.3%	20.0%	80.0%	56.5%
	No	Count	143_{a}	$2_{a, b}$	$5_{a, b}$	8_{b}	$15_{a, b}$	3_{a}	$1_{a, b}$	177
		Expected Count	127.8	4.2	6.6	18.3	16.0	2.1	2.1	177.0
		% within Synthesis writing in state COS	80.8%	1.1%	2.8%	4.5%	8.5%	1.7%	0.6%	100.0%
		% within Type of school	23.3%	10.0%	15.6%	9.1%	19.5%	30.0%	10.0%	20.8%
	Don't know	Count	92_{a}	3_{a}	4_{a}	58_{b}	31_{c}	$5_{b, c}$	$1_{a, c}$	194
		Expected Count	140.0	4.6	7.3	20.0	17.5	2.3	2.3	194.0
		% within Synthesis writing in state COS	47.4%	1.5%	2.1%	29.9%	16.0%	2.6%	0.5%	100.0%
		% within Type of school	15.0%	15.0%	12.5%	65.9%	40.3%	50.0%	10.0%	22.8%
Total		Count	615	20	32	88	77	10	10	852
		Expected Count	615.0	20.0	32.0	88.0	77.0	10.0	10.0	852.0
		% within Synthesis writing in state COS	72.2%	2.3%	3.8%	10.3%	9.0%	1.2%	1.2%	100.0%
		% within Type of school	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Type of school categories whose column proportions do not differ significantly from each other at the .05 level.

Table I9

COS synthesis requirement and low-SES percent in course

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Synthesis writing in state COS * Low SES % in school	840	69.0%	377	31.0%	1217	100.0%

Table I10

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	47.954[a]	8	.000
Likelihood Ratio	44.927	8	.000
Linear-by-Linear Association	18.215	1	.000
N of Valid Cases	840		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.85.

Table I11

			Low SES % in school					Total
			0-10%	11-25%	26-50%	51-75%	76-100%	
Synthesis writing in state COS	Yes	Count	101_{a}	133_{b}	127_{b}	80_{b}	$33_{a, b}$	474
		Expected Count	128.1	123.0	115.7	72.8	34.4	474.0
		% within Synthesis writing in state COS	21.3%	28.1%	26.8%	16.9%	7.0%	100.0%
		% within Low SES % in school	44.5%	61.0%	62.0%	62.0%	54.1%	56.4%
	No	Count	39_{a}	$45_{a, b}$	$48_{a, b}$	$27_{a, b}$	18_{b}	177
		Expected Count	47.8	45.9	43.2	27.2	12.9	177.0
		% within Synthesis writing in state COS	22.0%	25.4%	27.1%	15.3%	10.2%	100.0%
		% within Low SES % in school	17.2%	20.6%	23.4%	20.9%	29.5%	21.1%
	Don't know	Count	87_{a}	40_{b}	30_{b}	22_{b}	10_{b}	189
		Expected Count	51.1	49.1	46.1	29.0	13.7	189.0
		% within Synthesis writing in state COS	46.0%	21.2%	15.9%	11.6%	5.3%	100.0%
		% within Low SES % in school	38.3%	18.3%	14.6%	17.1%	16.4%	22.5%
Total		Count	227	218	205	129	61	840
		Expected Count	227.0	218.0	205.0	129.0	61.0	840.0
		% within Synthesis writing in state COS	27.0%	26.0%	24.4%	15.4%	7.3%	100.0%
		% within Low SES % in school	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Low SES % in school categories whose column proportions do not differ significantly from each other at the .05 level.

Table I12

COS original argument requirement and school setting

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.652[a]	4	.618
Likelihood Ratio	2.928	4	.570
Linear-by-Linear Association	.954	1	.329
N of Valid Cases	478		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.79.

Table I13

COS original argument requirement and school type

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.691[a]	12	.055
Likelihood Ratio	19.919	12	.069
Linear-by-Linear Association	9.325	1	.002
N of Valid Cases	480		

a. 11 cells (52.4%) have expected count less than 5. The minimum expected count is .33.

Table I14

COS original argument requirement and % low-SES students

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.935[a]	8	.270
Likelihood Ratio	9.900	8	.272
Linear-by-Linear Association	1.280	1	.258
N of Valid Cases	473		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.44.

Table I15

COS original argument requirement and type of course

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.756[a]	16	.231
Likelihood Ratio	21.629	16	.156
Linear-by-Linear Association	.005	1	.945
N of Valid Cases	497		

a. 8 cells (29.6%) have expected count less than 5. The minimum expected count is 1.75.

Table I16

COS original argument requirement and % nonwhite students in the ELA course

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.623[a]	8	.689
Likelihood Ratio	6.008	8	.646
Linear-by-Linear Association	.165	1	.684
N of Valid Cases	479		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.79.

Table I17

COS original argument requirement and years of teaching experience

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.984[a]	12	.958
Likelihood Ratio	5.133	12	.953
Linear-by-Linear Association	.021	1	.885
N of Valid Cases	480		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.83.

Table I18

College courses and years of teaching experience

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	42.111[a]	30	.070
Likelihood Ratio	43.337	30	.055
Linear-by-Linear Association	.732	1	.392
N of Valid Cases	855		

a. 3 cells (7.1%) have expected count less than 5. The minimum expected count is 3.38.

Table I19

College courses and school type

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.729[a]	30	.157
Likelihood Ratio	36.260	30	.200
Linear-by-Linear Association	2.533	1	.111
N of Valid Cases	854		

a. 23 cells (54.8%) have expected count less than 5. The minimum expected count is .47.

Table I20

College courses and ELA course type

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Courses addressing synthesis * Type of course	888	73.0%	329	27.0%	1217	100.0%

Table I21

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	57.364[a]	40	.037
Likelihood Ratio	59.102	40	.026
Linear-by-Linear Association	.039	1	.843
N of Valid Cases	888		

a. 20 cells (37.0%) have expected count less than 5. The minimum expected count is 1.02.

Table I22

			Type of course									Total
			AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	
Courses addressing synthesis	None	Count	120_{a}	40_{a}	$14_{a, b, c}$	5_{c}	$7_{a, b, c}$	$66_{a, b}$	$70_{a, b, c}$	71_{a}	$8_{b, c}$	401
		Expected Count	104.3	37.0	15.4	10.4	9.9	65.9	75.0	69.5	13.5	401.0
		% within Courses addressing synthesis	29.9%	10.0%	3.5%	1.2%	1.7%	16.5%	17.5%	17.7%	2.0%	100.0%
		% within Type of course	51.9%	48.8%	41.2%	21.7%	31.8%	45.2%	42.2%	46.1%	26.7%	45.2%
	Don't know	Count	11_{a}	$7_{a, b}$	7_{b}	5_{b}	$3_{a, b}$	15_{b}	22_{b}	$14_{a, b}$	5_{b}	89
		Expected Count	23.2	8.2	3.4	2.3	2.2	14.6	16.6	15.4	3.0	89.0
		% within Courses addressing synthesis	12.4%	7.9%	7.9%	5.6%	3.4%	16.9%	24.7%	15.7%	5.6%	100.0%
		% within Type of course	4.8%	8.5%	20.6%	21.7%	13.6%	10.3%	13.3%	9.1%	16.7%	10.0%

			Type of course									Total
			AP English Language	AP English Literature	IB English	Dual credit	ELL	Honors	College prep	Regular English	Other English	
	One	Count	$30_{a, b}$	7_{b}	$5_{a, b, c}$	$3_{a, b, c}$	$3_{a, b, c}$	$30_{a, c}$	$27_{a, b, c}$	33_{c}	$7_{a, c}$	145
		Expected Count	37.7	13.4	5.6	3.8	3.6	23.8	27.1	25.1	4.9	145.0
		% within Courses addressing synthesis	20.7%	4.8%	3.4%	2.1%	2.1%	20.7%	18.6%	22.8%	4.8%	100.0%
		% within Type of course	13.0%	8.5%	14.7%	13.0%	13.6%	20.5%	16.3%	21.4%	23.3%	16.3%
	Two	Count	$25_{a, b}$	14_{b}	1_{a}	$3_{a, b}$	$4_{a, b}$	$15_{a, b}$	$16_{a, b}$	$17_{a, b}$	$4_{a, b}$	99
		Expected Count	25.8	9.1	3.8	2.6	2.5	16.3	18.5	17.2	3.3	99.0
		% within Courses addressing synthesis	25.3%	14.1%	1.0%	3.0%	4.0%	15.2%	16.2%	17.2%	4.0%	100.0%
		% within Type of course	10.8%	17.1%	2.9%	13.0%	18.2%	10.3%	9.6%	11.0%	13.3%	11.1%
	Three	Count	10_{a}	4_{a}	0_{a}	1_{a}	1_{a}	8_{a}	9_{a}	5_{a}	3_{a}	41
		Expected Count	10.7	3.8	1.6	1.1	1.0	6.7	7.7	7.1	1.4	41.0
		% within Courses addressing synthesis	24.4%	9.8%	0.0%	2.4%	2.4%	19.5%	22.0%	12.2%	7.3%	100.0%
		% within Type of course	4.3%	4.9%	0.0%	4.3%	4.5%	5.5%	5.4%	3.2%	10.0%	4.6%
	Four or more	Count	$35_{a, b}$	$10_{a, b, c}$	$7_{a, b}$	6_{b}	$4_{a, b, c}$	12_{c}	$22_{a, b, c}$	$14_{a, c}$	$3_{a, b, c}$	113
		Expected Count	29.4	10.4	4.3	2.9	2.8	18.6	21.1	19.6	3.8	113.0
		% within Courses addressing synthesis	31.0%	8.8%	6.2%	5.3%	3.5%	10.6%	19.5%	12.4%	2.7%	100.0%
		% within Type of course	15.2%	12.2%	20.6%	26.1%	18.2%	8.2%	13.3%	9.1%	10.0%	12.7%
Total		Count	231	82	34	23	22	146	166	154	30	888
		Expected Count	231.0	82.0	34.0	23.0	22.0	146.0	166.0	154.0	30.0	888.0
		% within Courses addressing synthesis	26.0%	9.2%	3.8%	2.6%	2.5%	16.4%	18.7%	17.3%	3.4%	100.0%
		% within Type of course	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Type of course categories whose column proportions do not differ significantly from each other at the .05 level.

Reliability test for usefulness of PD opportunities

Table I23

Case Processing Summary

		N	%
Cases	Valid	188	15.4
	Excluded[a]	1029	84.6
	Total	1217	100.0

a. Listwise deletion based on all variables in the procedure.

Table I24

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.752	.760	14

Table I25

Item Statistics

	Mean	Std. Deviation	N
Department meeting at school	3.14	1.189	188
Professional learning group	2.89	1.389	188
Inservice at school	2.70	1.231	188
District workshop	2.63	1.262	188
College Board/AP workshop	2.45	1.713	188
Online discussion group	1.70	1.169	188
State ed assoc. conference	1.34	.902	188
Professonal org. regional conf.	1.43	1.034	188
Dual credit PD event	1.54	1.139	188
ELL PD event	1.56	1.124	188
College Board/AP regional forum	1.40	1.068	188
Professional org. national conf.	1.45	1.096	188
AP Annual Conference	1.39	1.087	188
IB PD event	1.28	.872	188

Table I26

Inter-Item Correlation Matrix

	Department meeting at school	Professional learning group	Inservice at school	District workshop	College Board/ AP workshop	Online discussion group	State ed assoc. conference	Professional org. regional conf.	Dual credit PD event	ELL PD event	College Board/ AP regional forum	Professional org. national conf.	AP Annual Conference	IB PD event
Department meeting at school	1.000	.453	.514	.415	-.133	.092	.165	.039	.099	.138	.019	.050	-.084	.091
Professional learning group	.453	1.000	.556	.437	.096	.289	.252	.272	.143	.280	.103	.199	.128	.123
Inservice at school	.514	.556	1.000	.663	.029	.204	.159	.113	.202	.268	.031	.172	-.004	.104
District workshop	.415	.437	.663	1.000	-.009	.098	.190	.161	.190	.168	-.032	.109	.036	.099
College Board/AP workshop	-.133	.096	.029	-.009	1.000	.136	.121	-.025	.124	-.018	.391	.230	.458	.104
Online discussion group	.092	.289	.204	.098	.136	1.000	.053	.209	.147	.215	.141	.178	.115	-.010
State ed assoc. conference	.165	.252	.159	.190	.121	.053	1.000	.457	.310	.160	.201	.374	.195	.156
Professional org. regional conf.	.039	.272	.113	.161	-.025	.209	.457	1.000	.263	.199	.173	.410	.198	.062
Dual credit PD event	.099	.143	.202	.190	.124	.147	.310	.263	1.000	.211	.172	.344	.157	.245
ELL PD event	.138	.280	.268	.168	-.018	.215	.160	.199	.211	1.000	.127	.111	.042	.182
College Board/AP regional forum	.019	.103	.031	-.032	.391	.141	.201	.173	.172	.127	1.000	.446	.493	.141

	Depart-ment meeting at school	Profes-sional learning group	Inser-vice at school	District work-shop	College Board/ AP work-shop	Online discus-sion group	State ed assoc. confer-ence	Profes-sional org. regional conf.	Dual credit PD event	ELL PD event	College Board/ AP regional forum	Profes-sional org. national conf.	AP Annual Confer-ence	IB PD event
Professional org. national conf.	.050	.199	.172	.109	.230	.178	.374	.410	.344	.111	.446	1.000	.451	.174
AP Annual Conference	-.084	.128	-.004	.036	.458	.115	.195	.198	.157	.042	.493	.451	1.000	.097
IB PD event	.091	.123	.104	.099	.104	-.010	.156	.062	.245	.182	.141	.174	.097	1.000

Table I27

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	1.922	1.282	3.138	1.856	2.448	.454	14
Item Variances	1.391	.760	2.934	2.174	3.862	.287	14
Inter-Item Correlations	.185	-.133	.663	.796	-4.972	.022	14

Table I28

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Department meeting at school	23.77	57.859	.287	.367	.745
Professional learning group	24.02	51.887	.533	.446	.717
Inservice at school	24.20	54.077	.491	.588	.723
District workshop	24.27	55.386	.399	.476	.733
College Board/AP workshop	24.45	55.992	.216	.318	.763
Online discussion group	25.21	57.834	.296	.165	.744
State ed assoc. conference	25.56	57.830	.425	.316	.734
Professonal org. regional conf.	25.48	57.598	.370	.364	.737
Dual credit PD event	25.37	56.512	.389	.227	.735
ELL PD event	25.35	57.885	.311	.178	.742
College Board/AP regional forum	25.50	57.257	.376	.364	.736
Professional org. national conf.	25.45	55.201	.496	.427	.725
AP Annual Conference	25.51	57.310	.363	.404	.737
IB PD event	25.62	60.514	.236	.111	.748

Table I29

Need for synthesis-writing PD and course type

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.067[a]	16	.176
Likelihood Ratio	23.473	16	.102
Linear-by-Linear Association	4.594	1	.032
N of Valid Cases	850		

a. 5 cells (18.5%) have expected count less than 5. The minimum expected count is .74.

Table I30

Need for synthesis-writing PD and school type

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.080[a]	12	.147
Likelihood Ratio	18.444	12	.103
Linear-by-Linear Association	.344	1	.558
N of Valid Cases	852		

a. 8 cells (38.1%) have expected count less than 5. The minimum expected count is .34.

Table I31

Need for synthesis-writing PD and % nonwhite students in course

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.595[a]	8	.692
Likelihood Ratio	5.535	8	.699
Linear-by-Linear Association	.038	1	.846
N of Valid Cases	851		

a. 3 cells (20.0%) have expected count less than 5. The minimum expected count is 3.14.

Table I32

Need for synthesis-writing PD and % low-SES students in school

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.841[a]	8	.356
Likelihood Ratio	8.872	8	.353
Linear-by-Linear Association	1.238	1	.266
N of Valid Cases	839		

a. 2 cells (13.3%) have expected count less than 5. The minimum expected count is 2.04.

Table I33

Need for synthesis-writing PD and years of teaching experience

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.166[a]	12	.357
Likelihood Ratio	13.627	12	.325
Linear-by-Linear Association	9.342	1	.002
N of Valid Cases	853		

a. 5 cells (23.8%) have expected count less than 5. The minimum expected count is 2.60.

Need for synthesis-writing PD and school setting

Table I34

	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Need for PD on synthesis * Instructional setting	852	70.0%	365	30.0%	1217	100.0%

Table I35

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.711[a]	4	.030
Likelihood Ratio	10.608	4	.031
Linear-by-Linear Association	4.644	1	.031
N of Valid Cases	852		

a. 1 cells (11.1%) have expected count less than 5. The minimum expected count is 3.84.

Table I36

			Instructional setting			Total
			Urban	Suburban	Rural	
Need for PD on synthesis	Unnecessary	Count	7_a	20_a	3_a	30
		Expected Count	6.6	19.5	3.8	30.0
		% within Need for PD on synthesis	23.3%	66.7%	10.0%	100.0%
		% within Instructional setting	3.7%	3.6%	2.8%	3.5%
	Helpful but not necessary	Count	103_a	307_a	43_b	453
		Expected Count	100.0	295.1	58.0	453.0
		% within Need for PD on synthesis	22.7%	67.8%	9.5%	100.0%
		% within Instructional setting	54.8%	55.3%	39.4%	53.2%
	Definitely want	Count	78_a	228_a	63_b	369
		Expected Count	81.4	240.4	47.2	369.0
		% within Need for PD on synthesis	21.1%	61.8%	17.1%	100.0%
		% within Instructional setting	41.5%	41.1%	57.8%	43.3%
Total		Count	188	555	109	852
		Expected Count	188.0	555.0	109.0	852.0
		% within Need for PD on synthesis	22.1%	65.1%	12.8%	100.0%
		% within Instructional setting	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of Instructional setting categories whose column proportions do not differ significantly from each other at the .05 level.