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Learning to Write in Middle School?

INSIGHTS INTO ADOLESCENT WRITERS' INSTRUCTIONAL EXPERIENCES ACROSS CONTENT AREAS

Joshua Fahey Lawrence, Emily Phillips Galloway, Soobin Yim, Alex Lin

Learning to write analytic genres may be particularly challenging for middle grade students because of the infrequency with which they are tasked with producing these types of texts.

Math Notebook (10/16)

What I look for in the equations is the quadratic term which is X^2 , X^2 , and the factor form and the factor form and the expanded form. This one is quadratic ($y = X^2 X^2 + 6X + 8$)
(written explanation of mathematical reasoning)

Social Studies Notebook (10/16)

The organization of the federal courts; the court of appeals.



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At the next level of the federal court system is the court of appeals which handle appeals from the federal district courts. In fact, the courts of appeals are often called circuit courts.
(notes from textbook and class)

English Language Arts Notebook (10/16)

Character traits
What the author tells us (direct characterization).
What the character says (indirect characterization)
What the character thinks or feels (indirect characterization)
What the character does (indirect characterization)
(notes from textbook and class)

Science Notebook (10/16)

Objective: write procedures for the experiment to test the blue and gray cubes. At least 8 detailed steps. Possible vocabulary include, syringe, plunger, tubing, clamp.
(notes from textbook and class)

—All entries from Millie, Grade 8

On a single school day, one middle school student wrote these text segments in her content area notebooks. These entries demonstrate not only the wide range of topics that adolescent writers must engage with as they traverse their content area classes, but also the variety of writing genres they must produce. Writing is both a support for content learning (writing to learn) and a method for assessing students' content knowledge (writing to demonstrate learning); however, it also represents a primary medium through which students as members of a disciplinary classroom share perspectives, make reasoned arguments, and engage in dialogue (Hyland, 2005; Moje, 2008). Often, when writing for the latter purpose of producing what we have dubbed analytic genres, learners are required to interpret phenomena, add causal links, or present an argument in writing (Schleppegrell, 2004).

Thick compendia of content standards, such as the Common Core State Standards Initiative (CCSS; 2010), delineate the writing genres, including many analytic genres, which adolescents are expected to proficiently produce at the end of each academic year. However, there is little institutional evidence of the so-called "writing diet"—conceptualized as the types of writing tasks completed by students during any given school day or assiduously across the school year—that supports the development of skilled writing. Yet, this information might contextualize the difficulties faced by novice writers in producing analytic writing genres on high-stakes assessments (Salahu-Din, Persky, & Miller, 2008).

To provide much-needed information about the instructional experiences of young writers, in this study we examined a corpus of written work produced by three seventh-grade and one eighth-grade student in 12 content area classrooms (science, social studies, math, and English) during evenly spaced intervals over one school year in a large urban middle school. In doing so, we begin to capture the texture of the writing diet of one sample of American adolescents. Specifically, the study catalogues the writing genres found in students' notebooks, commonly used as a daily record of in-class work, and examines

The ability to convey complex thinking in writing is important in all disciplinary traditions.

the proportion of analytic writing produced by these novice writers. Certainly, notebook entries are not the only form of literacy in classrooms, but in some schools, including the one in this study, they are an important daily activity across content areas. In the following sections, we present a frame for understanding the nature of adolescent writing tasks and then share our findings. We also consider how we may better support students in developing analytic writing skills.

What Do We Know About the "Writing Diet" of Adolescent Learners?

Recent large-scale studies using self-reported survey data from the National Assessment of Educational Progress suggest that, although teachers across domains recognize the power of writing as an assessment tool and support for learning content, they do not place an instructional emphasis on the production of extended composition by students; instead, they focus on notes, summaries, and short-answer questions (Applebee & Langer, 2011). Teachers of upper elementary school students report that they teach writing for an average of 15 minutes per day and place little focus on teaching analytic writing genres (Gilbert & Graham, 2010). This suggests that students are offered little opportunity to gain proficiency in composing complex texts (Jeffrey, 2009).

If knowledge is, as argued by Moje and Lewis (2007), the "residue of participation" in disciplinary communities, then knowledge of how to craft these high-level texts demands that students are offered ample opportunity to participate in these writing tasks. We do not contend that adolescent writers are (or should be) engaged in producing genres that perfectly mirror those completed by disciplinary experts. However, we do think that students should be engaged in producing increasingly complex texts in each content area, because the ability to convey complex thinking in writing is important in all disciplinary traditions (Hyland, 2005; Lee & Spratley, 2010). Yet, aside from select studies based primarily on teacher and student self-report of writing instructional practices (Applebee & Langer, 2011), the nature of the disciplinary writing tasks that American middle grade students complete on a daily basis has not, to our knowledge, been examined through document analysis, as we have done in this study.

Defining the Nature of Writing Tasks

Genres or Writing Task Types

We began to explore the writing lives of the learners in our sample by cataloging the genres in which they wrote across content areas during 40 school days. When writing, thoughts must be encoded into patterns of organization, known as genres or text types (Martin, 2009). Because the term *genres* is polysemous in the literature, in this study we use it to describe written texts that adopt certain grammatical forms and patterns of organization that reflect the text's social function (e.g., to recount, to persuade, to report) (Biber & Conrad, 2009; Martin & Rose, 2008; Nunan, 2007). Schleppegrell (2004) divides genres of academic discourse into three groups: *personal* (poem, narrative, journal), *factual* (summary, notes), and *analytic* (persuasive essay, thesis-support essay, analysis of a poem, lab reports as interpretations of observed evidence). Aligned with the language of the CCSS (2010), proficiency in analytic or analytical writing is positioned as an important skill for all learners to acquire.

Analytic Writing: Complex Genres Demanding Repeated Practice

The analytic genre, which is cognitively and linguistically distinct from these other writing task types, presents particular challenges to adolescent writers (Graham & Perin, 2007b). These challenges arise, in large part, because analytic writing requires writers to package knowledge in particular syntactic, lexical, and discursive structures and to use new patterns of text organization (Beck & Jeffery, 2009; O'Brien, Moje, & Stewart, 2001; Schleppegrell, 2004). While young writers generally demonstrate proficiency in organizing narrative texts by late elementary school (9–10 years old), skill at organizing expository texts seems to continue to develop well into high school (Berman & Nir-Sagiv, 2007). Unlike personal or factual genres, analytic genres require students to more frequently make use of logical markers of discourse (“as a result,” “therefore”), relational verbs (“lead to,” “influenced,” “cause”), and ways of organizing text (name entity, define, give causes) to construct a reasoned argument or to explain causes and effects by drawing on available evidence (Beck & Jeffrey, 2009). On a cognitive level, analytic writing in the disciplines further requires knowledge of what “counts” as evidence within each discipline and skill in constructing a logical argument, which is a

new and challenging task for many adolescent writers (Shanahan & Shanahan, 2008).

Because learning to write is essentially a subprocess of the developmental sequence known as later language development (Nippold, 2007), we might imagine that, like early language skills, writing skill is developed through recursively transacting with a particular genre, both receptively and productively. From this perspective, we may expect that a supportive instructional approach to teaching writing would include multiple opportunities to read and write a particular genre (Graham & Perin, 2007a, 2007b). Yet, developing analytic writing skill is not the sole instructional goal of most content area teachers. Presumably, when content learning is the primary instructional emphasis, writing serves the purpose of supporting students in retaining this knowledge, as when students are asked to create a glossary, produce a summary, or engage in a quick-write after reading (Applebee & Langer, 2011). Yet, how content area teachers negotiate these complementary instructional demands to simultaneously develop students' skill as writers and funds of disciplinary knowledge requires further documentation in the literature that seeks to describe classroom practice.

To better understand the context in which writing skill is acquired, this descriptive study was guided by the following questions:

1. What were the writing tasks (or genres) written across disciplines (math, science, social studies, English) by a small sample of middle school students in one academic year?
2. What was the proportion of analytic writing completed by students across disciplinary classes?

Research Design and Methods

Methods

Research site. As you walk toward the site of our research, Vale Middle School, at 7:30 any weekday morning during the school year, you will encounter a scene typical of many urban schools in the Northeast. Fifty to seventy students play basketball on a crowded court adjacent to the school. Members of Vale's student body, which is predominately black and Hispanic, talk, laugh, yell, and joke around. Teachers inside prepare for a long day (7:45 a.m. to 4:00 p.m.). During the school day, the environment at Vale is orderly. Classroom procedures are evident, including the cross-disciplinary use of notebooks to organize daily learning.

Each of the three floors of Vale houses a different grade level (grades 6–8). At each grade level, interdisciplinary teams of four content area teachers, plus special education teachers and paraprofessionals, are responsible for the academic instruction of about 100 students (divided among four homerooms). Every teacher sees each of the four homerooms every day. One of the key reasons we conducted our research at this school was the widespread use of notebooks in the cross-disciplinary teams whose students provided notebook data.

Before initiating this study, we attempted to understand how teachers used notebooks instructionally. A survey of all seventh- and eighth-grade students in the school revealed that notebook use was at similar levels across classes, although more prevalent in the eighth grade. Our interviews with the students revealed that they used notebooks as the primary vehicle of writing in classes across content areas, except in math, where they regularly supplemented notebook writing with handouts kept in folders (thus, we include these data in our analysis). English language arts (ELA), social studies, and science teachers reported regularly using notebooks and revealed that they had participated in professional development that touted notebook use. Although math teachers did not attend any professional development around using notebooks, they reported using notebooks on a daily basis. In keeping with teacher and student reports, we saw regular notebook use in all classes that we observed. In short, although not all important literacy outcomes and activities were captured in student notebooks, all evidence suggests that the majority of the daily literacy work done in each class was reflected in notebooks and (in the case of math class) worksheets that were collected in a folder. Thus, although we don't make claims about final products, such as science fair reports or work presented in published compilations, we do feel confident that the notebook data reported in this study reflect the day-to-day support and practice given to students for these summative writing projects, and it is this support, which constitutes the writing diet of adolescent learners, that we are primarily interested in.

How content area teachers develop students as writers requires further documentation in the literature.

Participants. This study focused on students who were taught by three interdisciplinary teams. Two were seventh-grade teams; one was an eighth-grade team. The corpus of data represents the writing produced across 12 content area classrooms. We asked teachers in each team to identify students who were conscientious note takers and regularly in attendance, among their roughly 100 students. Four students identified by teachers consented to participate in our study by providing us with notebooks in each content area at the end of the school year and participating in an interview.

Netty and Sandra (all names are pseudonyms) were students taught by one seventh-grade team. Both were African American. Netty received a designation of “needs improvement” on the state assessments of reading and math. Teachers reported that Netty was a strong student when on task. According to state tests, Sandra was a relatively strong math student (“proficient”) but scored “needs improvement” on her ELA standardized assessment. Her teachers characterized her as social and hard-working. Her notebooks featured writing (and doodles) produced with colored pens.

Achilles was a seventh-grade African American boy who was a gregarious and serious student. He had an individualized educational plan for math and ELA and did not reach proficiency on state standardized measures of math and English (“needs improvement” and “warning,” respectively). Teachers described him as making strong progress during the year of this study. Millie was a competent and serious Latina eighth grader who scored “proficient” on both reading and math standardized tests. Teachers identified Millie as an academic standout who was making strong progress during the year in which we conducted this study.

Although students in this study demonstrated a range of math and reading skills, they shared a reputation for regularly attending school and being active participants in classroom instruction, and, as a consequence, they wrote in their notebooks on a daily basis.

Data collection. A total of 17 notebooks were collected from these four students. Additionally, we collected four math folders. To get a fairly sampled representation of notebook data from content area classes, we chose to analyze one week from each month of the school year, resulting in 40 days identified for analysis. In total, we coded 290 pages of student notebook

entries taken in math ($n = 32$ pages), ELA ($n = 146$ pages), social studies ($n = 46$ pages), and science ($n = 66$ pages) classes. It is impossible for us to rule out the prospect that some worksheets or other materials were mislabeled or lost by students. However, we believe that if there is missing data, it is at random; we have no reason to think the trends from recovered work would differ from those that we coded.

We used some components of the Text Inventory, Text Interview, and Texts In-Use Observation Survey (TEX-IN3) (Hoffman, 2001) to characterize the literacy context of each classroom in which study participants were enrolled ($n = 12$). The TEX-IN3 provides systematic procedures for (a) capturing the range and quantities of text available in each classroom; (b) observing teachers and students as they make use of text during instruction; and (c) interviewing teachers and students to gain insights into their understandings of the types and functions of texts used instructionally. We conducted our evaluation based on multiple visits to each classroom, during which we observed a high rate of notebook usage.

We slightly modified the TEX-IN3 to conduct semistructured interviews with all the ELA teachers ($n = 3$), as well as one eighth-grade science teacher, one eighth-grade math teacher, and one seventh-grade social studies teacher. The interviewer began each interview by showing a series of cards with text types drawn from the TEX-IN3 listed on the back (e.g., *journals*, *textbooks*, *trade books*, *open-ended response*), asking the teacher to describe how important the specified text type was for students to read or, when applicable, to write in their content area. In addition, we asked teachers to discuss how notebooks were used instructionally.

Interviews with each of the four students were also conducted. These interviews also focused on text types read and written during each class. Students were asked to bring their notebooks from each discipline, to describe the kinds of work they did, and to comment on the kinds of texts they read and the sorts of writing they did in each class. We also administered student surveys to all students in the seventh and eighth grades at the beginning and end of the school year. These surveys explored student in-school and out-of-school reading and writing habits and provided validation that those classrooms and students profiled in this study were representative of the literacy habits of the Vale population at large (see Lawrence, 2012).

Notebook Coding

Through the coding process, each of the three coders conducted several layers of independent analysis and, in a series of 17 team meetings over a 6-month period, discussed discrepancies, resolved disagreements, and established scoring norms. Methods for analyzing student writing followed a grounded theory coding methodology, which makes use of a two-tiered analysis: an initial open coding of the data and, then, a thematic coding (Charmaz, 2006). A review of the existing literature yielded several typologies that were applied in the first tier of data analysis: (a) the writing tasks (genres) students were composing (class or text book notes, summary of text, short answer) and (b) if the writing was analytic.

Genres written. Notably, linguists attempting to generate taxonomies of writing tasks have not reached a clear consensus (Nunan, 2007), nor would we expect the writing of novices to map clearly to the genres produced by experts in a discipline. Given this, a set list of genres and their characteristics could not simply be applied to the data. Rather, we were guided in delimiting writing tasks (genres) by posing a series of three questions formulated by Nunan (2007): (1) Do the two texts share the same social/communicative purpose? (2) Do they have the same patterns for organizing discourse? (3) Do they exhibit the same grammar and vocabulary?

In the first tier of coding, 17 distinct genres were identified in students' notebooks. Through a recursive process of applying these categories to the student writing samples, these categories were expanded to include additional genres, and the previous entries were recoded to reflect these additions. For example, as we coded students' writing in math and science classes, the category "genre written" was expanded to include "computations" and "explanations of mathematical or scientific thinking." The resulting list of codes was not based on any preestablished criteria for features that a specific genre must include, and we will discuss the implications of this coding decision below.

Nature of genres written: Analytic. Drawing on previous distinctions in the literature (Schleppegrell, 2004) and through engagement with the data, we designated analytic genres as those that required students to orchestrate numerous perspectives, texts, or sources of evidence and to interpret phenomena, add causal links, or present an argument. In the corpus, examples included argumentative essays, the presentation

TABLE 1 Frequency of Genre of the Text Written by Subjects Across All Students

Genre of the Text Written	Description of Genre
Analytic Writing Genres	
Written explanation of math/science reasoning	Written explanation of thinking in math or science
Reading response	Summary of reading & textual references (evidence)
Evaluation	Summary of reading & textual references & analysis
Essay	Extended written piece, including a thesis & supporting arguments/evidence + conclusion
Newspaper article	Recount of information from more than one perspective
Lab report	Written account of scientific process and explanation of conclusions
Nonanalytic Writing Genres	
Notes from textbook/class	Summary, paraphrase, or recount of information
Short answer to teacher prompt	Short written answer; no use of textual evidence/supporting arguments
Graphic representation	Picture, map, chart
Computation (numbers)	Numeric notations; no extended explanation of thought process
Journal	Emotive response to text citing no textual evidence/sharing a personal experience, making no connection to the text
Summary	Recount of events evidencing no evaluative stance or use of textual evidence
Poem	Original poem
Annotation of poem	Underlining, defining unknown words within the text
Short stories	Original fiction or nonfiction story
Multiple choice	Work related to multiple-choice assessment items
Preview and prediction	Short written predictions with no use of textual evidence or supporting arguments
Vocabulary list/glossary	Word lists for vocabulary study

of evidence in an essay, lab reports including student-generated explanations of scientific phenomena, and extended explanations of thinking observed in the math and science writing samples (Table 1). Frequent discussions among raters resulted in adequate coding reliability on ratings of 15% of the samples ($Kappa = 0.78, p < 0.001$).

Results

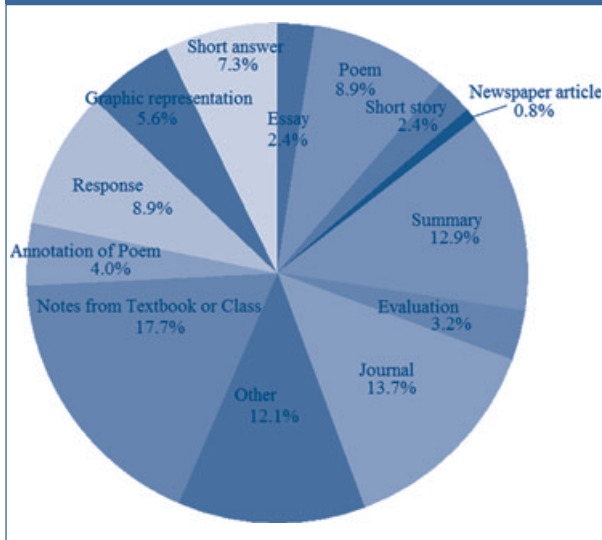
RQ1. What are the writing tasks (or genres) written across disciplines (math, science, social studies, English) by a small sample of middle school students in one academic year?

Of the 17 genres in our total sample (Table 1), we found the greatest range in English language arts notebooks (Figure 1). Although students had an abundance of class notes (17.7%), journal entries (13.7%),

and summaries (12.9%), we also observed significant evidence of reading responses, poems, evaluations, essays, and other types of writing. Drawing from teacher interview data, some of the curricular themes in English classes were organized around writing and responding to different genres, which was probably one reason we found such a diversity of writing tasks in students' ELA notebooks. Some writing tasks, such as journal entries, appeared consistently across the school year in our sample. Other genres, such as poetry, did not appear until March, when there was a spike in use of this genre in seventh-grade ELA classes. Perhaps not surprisingly, data from the TEX-IN3 in ELA suggested that these classrooms also had the greatest diversity of texts read.

Genre diversity was also reflected in students' science notebooks (Figure 2). The most prominent genre type was written explanations of scientific reasoning

FIGURE 1 Written genres found in ELA notebooks



(35.7%). As shown in Table 1, this genre is characterized by an extended written explanation of thinking; however, although this feature was evident in all instances we coded, there was much variation in the form these explanations took, even within the notebook of a single student. For instance, in an excerpt of his description of “non-living things,” Achilles reasoned that “seeds and eggs are living things because even though they are not bloomed and hatched... they can turn into something like a chicken or a full bloomed flower. You can’t make a living thing from a non-living thing.” Later in the year, when writing about the characteristics that defined the “5 kingdoms

FIGURE 2 Written genres found in Science notebooks

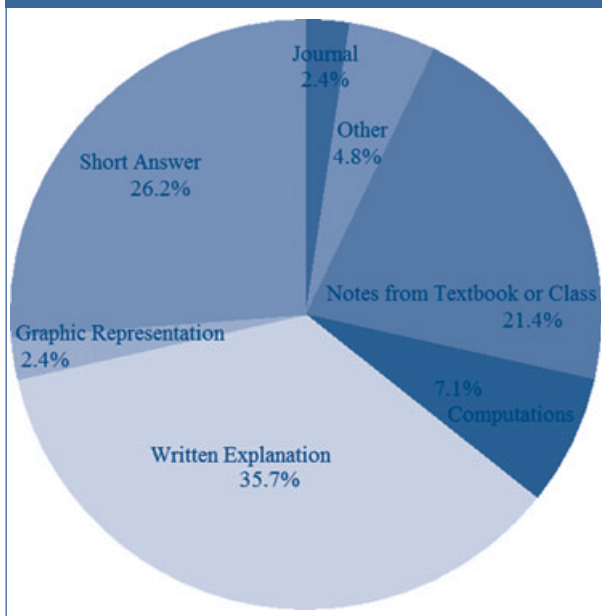
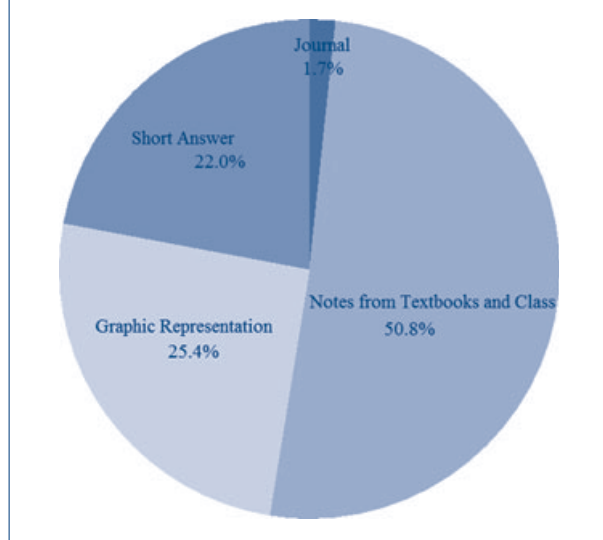
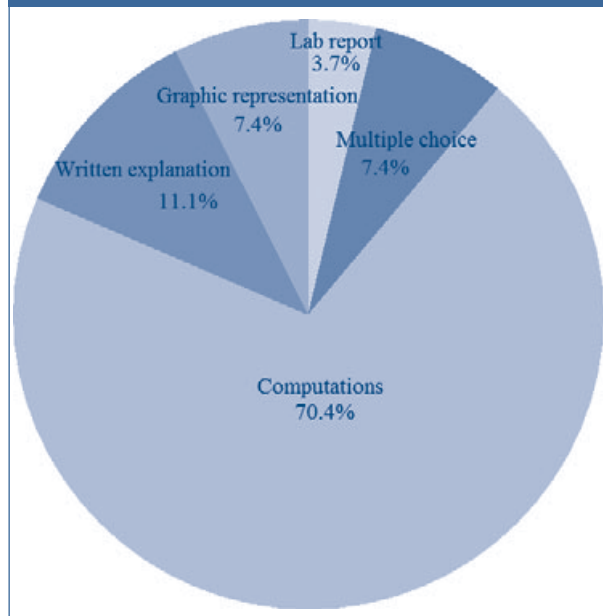


FIGURE 3 Written genres found in Social Studies notebooks



of living things,” Achilles again makes an argument citing evidence; however, this time the language of argument evidences more sophistication: “The trait that makes animals who they are is that they are multicellular organisms. Plants, for example, a rose is multicellular.” The underlying cognitive demands of this genre, which required the use of evidence to support an assertion, allowed us to identify multiple cases of this task type, even though different instances had dissimilar linguistics and textual features. Science notebooks also contained ample evidence of student note-taking from textbooks and class lecture (21.4%) and short answers to teacher prompts (26.2%). There

FIGURE 4 Written genres found in Math notebooks



were also examples of numerical computation (7.1%), graphs and figures (2.3%), and journal entries (2.2%).

Students produced a more narrow range of written texts in their social studies notebooks (Figure 3). Most entries were used to record notes from the textbook or class lectures (50.8%), draw maps and visualizations (25.4%), and respond to teacher prompts (22%). Again, we see the curricular emphasis of the particular class or grade-level influence the genres written. Because, according to teacher interviews, the focus of seventh-grade social studies was geography, we were not surprised to see extensive use of maps in seventh-grade notebooks. Additionally, the types of texts written showed parity with the genres read in that discipline. During interviews, social studies teachers reported spending the most time reading the textbook, and TEX-IN3 text inventories suggested that few other texts were made available to students.

In math classes, we coded notebooks as well as folders. We found the vast majority of written work was numerical computation, with instances of written explanation, graphical representations, reporting, and multiple-choice work combining to make up less than 30% of the sample (Figure 4).

It is worth noting that the genres we coded for were based on our iterative coding process, not independent criteria based on register features, such as might be obtained from a functional linguistics perspective (see, for example, Schleppegrell, 2004; or Martin & Rose, 2008). Thus, in some cases, the genre we identify may not include some key feature that *should be* or typically *is* found in that genre. For instance, we found examples of factual reports that did not use simple present tense verbs. Our iterative coding allowed us to consistently and reliably code these genres, and we interpret differences from expected features as areas where students are developing in their understanding of the genre.

RQ2. What was the proportion of analytic writing completed by students across disciplinary classes?

The most striking finding from this study is that only 15% of the writing done in this sample of notebooks could be considered analytic writing, even by the generous criteria we applied (Table 2). In ELA classes, the analytic writing that we found consisted of editorials, evaluations of literature, and responses to text. For example, when discussing the book *Bridge to Tarabithia*, Sandra wrote: “My prediction is that

TABLE 2 Percentage of Analytic Writing by Subject Across All Students (Percentage in Parentheses)

Subject	Analytic Writing	
	Analytic	Nonanalytic
English	19 (15.3%)	105 (84.7%)
Math	4 (14.8%)	23 (85.2%)
Science	15 (35.7%)	27 (64.3%)
Social Studies	0 (0.0%)	59 (100.0%)

after Leslie dies and that they get the castle that Jess will have his little sister become queen. My evidence for this is that Jess’ little sister is always wanting to go with Leslie and Jess, but...never did.” Although we identified a few essays in the English notebooks, we found no instances of analytic essays. Instead, typical entries asked student to summarize and record information.

Work produced in math classes included examples of analytic writing (roughly 15%). One reason for the relative dearth was that math notebooks and worksheets contained primarily numeric computation. Within noncomputational entries, 31% of the writing was analytic. Analytic entries about mathematical concepts were similar, in some respects, to analytic writing in ELA classes; but, although both required students to use evidence to support thinking, analytic writing in math was unique in its brevity and in the evidence used. For example, in Millie’s math notebook she explains the process for calculating a quadratic equation and references a graph as evidence: “The area of each region was calculated by the product of the dimensions. Using the dimensions, I wrote a factor form...the sketch of the graph was made from the factored form. Finally, a minimum value was identified based on the shape of the graph and the equation.” Although shorter than analytic writing entries found in English notebooks, those found in math placed similar cognitive demands on learners by requiring the use of evidence to support a statement or conclusion. However, we also noted that analytic writing in math and science notebooks was diverse in form and organization, with some entries consisting of a single sentence whereas others consisted of a paragraph. This finding suggests fluidity to the analytic genre within the sciences that we did not observe in English entries.

We were surprised to find no examples of analytic writing in social studies notebooks. In

seventh-grade social studies classes, students studied cartography as well as physical and human geography standards, such as “identifying multiple causes and effects when explaining historical events” and “constructing and interpreting timelines of events and civilizations studied” (Massachusetts Department of Education, 2003, p. 42). As these standards indicate, students are expected to consider multiple perspectives and gather evidence in support of a particular view, which suggests the opportunity for analytic writing tasks. Although our sampling method does not preclude the possibility that an analytic essay was requested or required by seventh- and eighth-grade social studies teachers at Vale, it does suggest that for large stretches across the school year, students had no daily experience with writing analytic essays in the ways that expert historians and social scientists might.

Discussion

If genre mastery results from multiple opportunities to practice, adolescents face a mammoth task in mastering the many genres they encounter across content areas each day. Our analysis suggests that the students in this study received very little explicit scaffolding on a daily basis to produce analytic writing. This is not to say that students were not expected to produce these genres (Moje, 2008). Our classroom observations, interviews, and classroom text inventories demonstrated that teachers required their students to complete science fair projects, historical essays, and persuasive narratives as part of summative evaluations biannually and on high-stakes tests. Furthermore, all teachers articulated the importance of analytic writing as a component of instruction. However, our data suggest that on a *daily* and *weekly* basis, students were provided with few opportunities to practice this analytical writing. Although the sample is small, this data may begin to explain why researchers find that analytic writing produced by adolescents is often poorly executed or why content area teachers, despite having taught the content well, are often discouraged by the analytic writing that students produce.

Our analysis suggests several areas that teachers, coaches, and instructional leaders should consider focusing on as ways of expanding disciplinary writing practices. Essentially, content area teachers should consider daily writing practice to be the diet that prepares novice writers to produce the analytic writing

genres indicative of each discipline. This implies a need for assiduous practice in writing the most complex genres that a discipline requires. These data also suggest that the reading and writing of analytic texts should be viewed as reciprocal processes. In settings, such as ELA, the genres read appeared to roughly correspond with those that writers produced. In classrooms where textbooks serve as the only mentor text available, these data suggest that novice writers may benefit from exposure to the analytic genres that are indicative of each discipline. Fundamentally, there is a need to provide students with access to disciplinary texts that are like those that content area teachers hope they will produce. (See Phillips Galloway, Lawrence, & Moje, 2013 for additional discussion of this concept.)

Another important finding from these data is that the form of analytic writing is much more variable in content area classes than it is in English classes. In ELA classes, the most cognitively sophisticated writing was done in essays, evaluations, and responses that had typical forms, which are often explicitly taught. In science and math classes, sophisticated writing to difficult questions could be described only as “written explanations,” but beyond the general cognitive demands we used as identification criteria, there were few recurrent linguistic or textual features in these explanations. This suggests that the “analytic genre” of novice writing is less codified in these subject areas than in English, which presents instructional challenges for teachers who are tasked with inviting adolescents into these disciplinary ways of writing, which are arguably less transparent.

We acknowledge that this descriptive study has many important limitations. It is unclear to what extent Vale is typical of other U.S. middle schools. For instance, it is unclear if technology use to support writing in this school is as high as it is in other U.S. urban schools, given that, when surveyed, students reported relatively low website access ($M = 3.4$ on a 7-point Likert scale, indicating website access less than once a week) ($n = 239$). Whereas students in other schools may be making use of technology to engage in extended writing, such was not the case at Vale, where most writing was still done in notebooks. Additionally, this study made use of a small sample in one school, which limits the generalizability of our findings.

Despite these limitations, this study suggests that adolescent writers at Vale, and perhaps in other

schools as well, may face great challenges in acquiring the skills to write compositions that meet disciplinary genre standards in part because they have relatively little experience producing these types of texts. The task faced by us, as educators, is equally great, given the genre diversity that exists in school contexts.

Take Action

STEPS FOR IMMEDIATE IMPLEMENTATION

To improve the “writing diet” of middle graders, consider both what students read and what they write:

- ✓ **Writing:** Allot a portion of each class for an abbreviated writing task that demands the use of reasoned thought and is indicative of the higher level writing produced in your discipline writ large.
- ✓ **In science:** Students might be asked to write well-supported justifications of thinking and to cite experimental findings.
- ✓ **In English language arts:** Students should cite textual evidence to support conclusions about characters when writing.
- ✓ **In math:** Students can be engaged in explaining through both written and symbolic language how they arrived at an answer.
- ✓ **In social studies:** Students should be engaged in writing tasks that ask them to support an interpretation of historical events using historical evidence (primary sources).
- ✓ **Reading:** Select examples of analytic writing written by experts in a domain or by proficient novices and make explicit the disciplinary “moves” that the author uses to construct a reasoned argument or to explain causes and effects by drawing on available evidence.

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