Authentic Instruction for 21st Century Learning: Higher Order Thinking in an Inclusive School

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Abstract

The author studied a public junior high school identified as successfully implementing authentic instruction. Such instruction emphasizes higher order thinking, deep knowledge, substantive conversation, and value beyond school. To determine in what ways higher order thinking was fostered both for students with and without disabilities, the author analyzed contextual factors, classroom observations, interviews, assessment tasks, and work samples from five inclusive English and science classrooms. Teachers consistently and systematically used higher order questions, metacognitive strategies, modeling, specific feedback, connections to prior learning, critical pedagogy, elaborated writing tasks, and assignments that connected to students' lives outside of school. Students with disabilities completed the same authentic tasks as their peers without disabilities but with somewhat lower scores. Contextual analysis suggested that the culture of respect throughout the school fostered higher order thinking, and likewise, the expectation for that kind of thinking fostered the culture of respect.

The Partnership for 21st Century Skills (2009) has identified creativity, innovation, critical thinking, problem solving, communication, and collaboration as key skills needed for the 21st century. In contrast, No Child Left Behind's requirement that students, including those with disabilities, participate in high-stakes testing, has led to greater emphasis on basic skills, factual material, and formulaic writing (Costa & Kallick, 2004; Dede, 2010; Fischer, Bol, & Pribesh, 2011; Kixmiller, 2004). This emphasis seems misguided, because research has demonstrated that students do better on high stakes tests when their teachers engage them in high quality intellectual work rather than emphasizing basic skills and broad coverage of material (e.g., Newman, King, & Carmichael, 2007; Wenglisky, 2004).

Research findings suggest that higher order thinking skills can be nurtured in elementary and secondary students representing diverse racial and socio-economic backgrounds when schools practice authentic instruction (Newman, Bryk, & Nagaoka, 2001; Newman, Marks, & Gamoran, 1996). Authentic instruction refers to teaching that promotes constructing knowledge, disciplined inquiry, and assignments of immediate value beyond school (Newman et al., 1996). The approach seeks to academically challenge students and engage them in issues that have personal or social significance. Engaging students in high quality intellectual work has resulted in comparable positive outcomes for secondary students with and without disabilities (Morocco, Hindin, Mata-Aguilar, & Clark-Chiarelli, 2001; Phelps, 2005). In fact, King, Schroeder, and Chawszczewski (2001) found that students with disabilities in grades 9-12 who were given challenging tasks performed better than students without disabilities at the same grade level who were given less challenging tasks. Nevertheless, many teachers reserve authentic instruction for higher-functioning students who are perceived to have a more solid knowledge base (Collins, Palincsar, & Magnusson, 2005), even though students with disabilities often have similar background knowledge (Palincsar, Magnusson, Collins, & Cutter, 2001).

Background to the Study
In the mid-1990s, Newman and his associates (Newman, Secada, & Wehlage, 1995) created standards for authentic instruction, assessment, and performance that examined higher-order thinking, substantive conversation, deep knowledge, and relevance to the outside world. They studied 24 elementary and secondary schools by evaluating instruction and student work, the relationship between instruction and student performance, and access to such instruction for diverse groups of students (Newman, Marks & Gamoran, 1996). Where authentic instruction was identified, the average student performance improved from the 30th to the 60th percentile.

Following Newman's study, the Research Institute on Secondary Education Reform (RISER) studied whether students with disabilities might experience similar benefits from authentic instruction (Hanley-Maxwell & Phelps, 2003). They selected four secondary schools that demonstrated "a high degree of inclusive practices" (King & Youngs, p. 3) and also emphasized authentic learning and assessment. RISER'S selection criteria included the following related to inclusive practices:

Core beliefs of the faculty and administrators reveal that all students, including those with disabilities, can achieve authentic standards if given adequate support strategies and instructional resources.

To insure students with disabilities achieve authentic instructional tasks and assessments at a level comparable to their nondisabled peers whenever possible, adjustments or accommodations are made only when a compelling educational justification is clearly in evidence. (Criteria for schools of authentic and inclusive teaching and learning, 2003).

The RISER study found that both authentic learning and high standards in the academic disciplines could be achieved in inclusive settings. In fact, authentic practices were stronger predictors of outcomes than were students' disability status or academic ability. Graduates of SAIL schools (Schools of Authentic and Inclusive Learning) had higher levels of participation and achievement in postsecondary education, college completion, job satisfaction, and civic involvement than comparable national samples, with little difference between those with and without disabilities (Hanley-Maxwell & Phelps, 2003; Phelps, 2005).

The RISER study identified instructional quality as the most important factor influencing student work (King, Buckley, Schroeder, Braden & Hurwitz, 2004), but did not describe in detail what actually went on in classrooms practicing authentic instruction. The current study, therefore, examined what teachers do to foster authentic learning (and in particular, higher order thinking) in an inclusive school. The following research questions were examined.

1. What strategies do teachers use, what tasks and assessments do they assign, and what dispositions are evident in their teaching?

2. How much of the teachers' instruction and assessment actually promotes higher order thinking?

3. To what extent and in what ways do students' work and participation in these inclusive classrooms demonstrate higher order thinking?

4. What contextual factors appear to interact and foster authentic learning?

Method

Setting

I conducted a national search for a racially and economically diverse public secondary school that had successfully implemented authentic instruction. I sought a school that met RISER'S criteria for inclusive schools, where Students with disabilities were an integral part of the school community and participated in the same authentic learning activities as their peers without disabilities. A call for nominations was sent to
46 individuals and 3 listservs identified in the literature and in my professional network as fostering authentic and inclusive education.

After reviewing the fourteen schools nominated, I selected a public junior high school in a medium-sized city in the Midwest. The school district had received a federal grant in 1998 to restructure their schools to focus on authentic learning. After the grant period, the district continued its intensive focus on high quality intellectual work for all students achieved through authentic instruction and differentiation. The school population of 645 students included 74% Caucasian, 16% Asian, 7% Hispanic, 2% African American, and less than 1% American Indian. The school served a low socio-economic area, with 41% receiving free or reduced price lunches. Students with disabilities represented 13.8% of the school population.

Participants

The original criteria for teacher participants were English language arts and special education teachers working in inclusive classrooms. Six teachers volunteered to participate in the study and five continued throughout the study - four general education teachers in grades 7-9 and one special education teacher. The general education teachers had from 10 to 34 years of teaching experience. One English teacher team-taught with a science teacher, so the criteria expanded to include the 8th grade integrated English/science class. In 7th grade English, first hour was split between two teachers for writing workshop and reading. The special education teacher co-taught in the three participating 7th grade sections, alternating between the classrooms as needed. All the teachers had special education students in their classrooms, ranging from 11% to 50% of the class (see Table 1). This paper focuses on the general education teachers.

Data Collection

The principal facilitated parent permission and access to classrooms. I spent full days for five weeks, observing, interviewing, and interacting with staff and students. This included 47 hours of classroom observation; 10 interviews with teachers; 5 focus groups and 2 individual interviews with students; a formal interview with the principal; informal observations in the library, hallways and cafeteria; and numerous informal conversations with participating teachers and the principal. Time was also spent in three days of in-service workshops at the school conducted by outside consultants; participant observation of faculty working in small learning teams; meetings with the district directors of student learning and of special education; and examination of school and district documents and websites.

During classroom observations, I took notes with an electronic pen on a tablet laptop, recording the dialogue and behaviors exhibited by both teachers and students. Participating teachers provided 11 assessment tasks for analysis along with student work samples for those tasks from each of the classes observed (total of 200 samples). Five of those were major assignments, and the remaining were daily tasks.

Participating teachers each gave two interviews, one at the beginning of the study and one at the end. Students in each of the five classrooms participated in focus group interviews, and two ninth grade students chose to be interviewed separately. I held one interview with the principal and talked with her informally on an almost daily basis. Interviews were recorded and transcribed, except for one student focus group interview for which only notes were taken.

Data Analysis

Using qualitative data analysis software (NVivo), I began by establishing an initial hierarchy of codes based on the standards for authentic instruction as established by Newman, Secada, & Wehlage (1995).

Standard 1: Higher Order Thinking. Instruction involves students in manipulating information and ideas by synthesizing, generalizing, explaining, hypothesizing, or arriving at conclusions that produce new meaning and understandings for them. (p. 29)
Standard 2: Deep Knowledge. Instruction addresses central ideas of a topic or discipline with enough thoroughness to explore connections and relationships and to produce relatively complex understandings, (p. 31)

Standard 3: Substantive Conversation. Students engage in extended conversational exchanges with the teacher and/or their peers about subject matter in a way that builds an improved and shared understanding of ideas or topics, (p. 35)

Standard 4: Connections to the World Beyond the Classroom. Students make connections between substantive knowledge and either public problems or personal experiences, (p. 40)

If instruction appeared to be fostering any of the authentic instruction standards, that portion of the observation was coded at that standard. Any part of a lesson could be coded at more than one standard. Classroom observations and interviews were all coded, using the initial hierarchy of codes and generating new codes for specific teaching strategies, actions of students, topics of student and faculty interviews, and contextual factors.

I scored one major task from each of the five classes observed, using the assessment task rubrics developed by the RISER group specifically for writing and for science (Schroeder, Braden, & King, 2001). Both rubrics use the three standards of construction of knowledge, elaborated communication, and connection to students’ lives, but each has criteria specific to the discipline. A practitioner (not from the participating school) and I scored student work samples from these same tasks using rubrics developed specifically for student work in writing and science (Schroeder et al., 2001).

The writing standards included construction of knowledge, forms and conventions, and elaborated communication. The science standards included scientific analysis, disciplinary concepts, and elaborated communication. We both scored at least 18% of each set of work samples and compared our scores. If our scores differed, we discussed our rationale for the scores given and compared additional samples. Then one of us scored the remaining samples in that set. Exact agreement was 65% on English and 50% on science samples. Adjacent agreement was 35% on English and 50% on science samples. Combined exact and adjacent agreement was 100% for both English and science. Daily work samples and transcribed class discussions were coded using Bloom's revised taxonomy (Anderson & Krathwol, 2001) aligned with the authentic student work rubric, which was consistent with the school's reference point.

After conducting preliminary analysis of the observations and interviews, I returned to the research site for member checks. The research participants provided their feedback on preliminary findings and answered questions generated from the preliminary analysis.

Limitations

Several limitations to the study should be considered. Teacher participants were volunteers and were not necessarily representative of the entire school (although the principal claimed similar instruction was evident in all classrooms). The dialogue notes from classroom observations were not entirely complete because of the difficulty in hearing students' voices, especially when they worked in small groups. Rubrics for tasks and student work were not identical so it was not possible to compare scores of tasks with student work. Some sets of work samples did not lend themselves to scoring with the rubric (poetry, for example). Those work samples were coded instead.

Findings

The findings that are presented below are organized around a.) how the principal fostered authentic and inclusive instruction, b.) the kind of instruction observed, c.) the tasks and work samples reviewed, and d.) the interaction of school culture and authentic instruction.
Professional Development and Administrative Support

The entire district, and especially this particular school, had intentionally fostered authentic instruction and differentiation since 1998 with the primary purpose of improving student learning. The principal provided strong leadership in developing and implementing a building level plan. All teachers were expected to have a professional development plan and to participate on a learning team, each of which focused on one standard of authentic instruction. All teachers conducted action research in their classrooms, consulting with their team members about their studies, participating in peer reviews of their inquiry projects, and submitting reports of their work to the principal. The principal and the assistant principal took on hall and lunch duty so that teachers would have one period every other day to do this work. Instead of one staff meeting a month, teachers observed in each other's classrooms and scored each other's work according to the authentic instruction rubric. Late-start and in-service days were used for learning teams to meet. Every 3rd and 4th year teacher (new to the district) was required to make a portfolio that included lessons, assessment tasks, and pieces of student work, all scored with the authentic framework rubrics. The principal observed and worked with those teachers.

Along with high expectations, the principal honored and respected faculty for the work they were doing. She said in her interview:

I want teachers to try these very difficult things in their classroom. It's okay if they fail but they have to continue working on this as hard as they can. But you can't continue to do that and ask them to do all the other things they've been asked to do. How can I honor them, how can I tell them I appreciate all that they're doing? Whenever I get the opportunity, I talk about the courageous work that it takes to make a difference.

Instructional Strategies and Differentiation

In interviews with teachers, a common theme was their focus on essential questions, the big ideas of their discipline. Their goal was that rather than learning isolated facts, all students would understand how facts related to each other and would make connections between the content and their life outside of school. Students would develop new insights and make inferences by matching their background knowledge with new information. Another major focus of all the teachers was empowerment. Students would see themselves as independent learners, change agents, scientists, and communicators. Finally, students would be critical thinkers who questioned what they heard and read.

An analysis of observed lessons indicated that a substantial portion of the lessons supported these goals. As shown on Table 2, an average of 67% of a lesson was coded as fostering higher order thinking. Four of the five classes ranged from 52% to 87%, while one was at 35%, thus confirming that a substantial portion of class sessions fostered higher order thinking. The other standards of authentic instruction were coded an average of 44% of the lesson, depending on the particular standard, teacher, and class.

Most lessons had several components, including strategy instruction; modeling of assignment tasks; peer editing; reading, listening or viewing content with quick writes and discussion; and individual conferences with the teacher. These strategies would be effective for students both with and without disabilities, but I asked teachers how they differentiated specifically for students with disabilities. They responded by first emphasizing that students with disabilities were expected to do the same challenging work as the other students. Scaffolding, providing temporary supports while students build skills to complete a task independently, was the most common strategy used, but teachers were quick to point out that they also used scaffolding for many students who did not have disabilities.

Flexible grouping, in which teachers strategically place students in different groups depending on specific needs for a particular task, was another common way they differentiated. Other strategies mentioned were building on students' interests, monitoring student progress closely, and reminding students of prior
learning. Teachers also consulted with the special education teacher to ask for advice, for example, on how to help a student succeed on an upcoming task.

To determine how classroom teachers promoted authentic learning for all students, I conducted a matrix query of strategies in use when instruction was also coded at the authentic instruction standards (see Table 3). Teachers used intentional strategies to foster higher order thinking skills, such as encouraging metacognitive thinking, asking probing and persistent questions, challenging students to question the status quo, providing writing prompts that required analysis and evaluation, and giving specific feedback. They did not just ask students to do critical thinking; they also modeled thinking processes, such as making connections between prior and new learning. The following are examples of how the most common strategies were used.

Built on prior learning and background knowledge. Teachers frequently referred back to concepts students had learned previously. They asked, "Is this clicking from what you learned last year?" "Remember when we talked about inventions and engineers?" Writing prompts in class required students to make connections in their writing. For example, Teresa showed a video and asked students to write about how it connected to what they had been reading.

Teachers also encouraged students to draw on their background knowledge. For example, when Nancy was helping 7th grade reading students learn how to interpret editorial cartoons, she asked, "What do you already know that helps you interpret this cartoon?" Students mentioned vocabulary words they knew. She then followed up by asking them what they knew about those words. She continued to ask questions about things they knew until they finally figured out the meaning of the cartoon.

Fostered metacognition. Teachers taught students metacognitive strategies and how to apply them. Teachers asked students about the strategies being used: "Why do you think I asked you to do this?" "What reading strategy did you just use?" "Are you thinking like a scientist?" "Are you an image reader or inferential reader?" The teachers asked students to actively think about their learning. For example, Nancy asked students the reasons they might not understand something they read. She wrote their reasons on the board and then asked students how they could address those issues. Teresa instructed students to find an example of when they were forced to make an inference when reading a poem, and to find an example of each of the reading strategies studied.

Students were aware of the metacognitive strategies they were being taught. In interviews with students, they talked about how the teachers used T-charts and organization charts to help them organize their thinking, how teachers taught them to ask thick questions, and how writing things on sticky notes made them think more deeply about what they were reading. One student said, "It helps us make more connections. The two thoughts that go through a reader's head: One thought is what the story is actually telling you and the other thoughts are questions, comments, connections." Another student referred to the sticky notes: "It helps you grasp a whole new meaning. If you read something, you might say, 'Her shirt says Fat Albert.' But using the stickies, you'd be like 'Who's Fat Albert? Why does he have his own shirt? Why is he on a cartoon and movies? We actually dig through the dirt and try to find out details."

Modeled and provided examples. When giving a new assignment, the teachers would frequently provide examples of the thinking process students would need to go through to complete the task. Teresa used a graphic organizer to model how students could think about their reading. The organizer had three columns - for a highlighted quote from the reading, the reason for the highlighting, and the new or deeper thinking about the quote. She modeled using the organizer by choosing something from the reading and thinking out loud about it. Then she walked through the process with students doing the same. Finally, students were directed to use this process in their reading.

In science, before students were asked to code segments of an article as either fact or hypothesis, Mary showed an article on a related topic and did the assigned activity as an example. Similarly in English, before assigning students to write a poem, Teresa played a rap song and provided the words to the class.
Students were then instructed to look for examples of the six poetic devices they had learned before writing their own rap poems using the poetic devices. When teaching figurative language, Nancy gave examples: "Susie walks like a duck." "He's as skinny as a rail." "Susie is a sponge." After each example, Nancy asked what the statement meant and what kind of figure of speech it was. This was in preparation for students to write about examples of figurative language from their reading.

Promoted students to write. Students were frequently asked to do quick writes. These writing tasks ranged from open-ended queries to structured graphic organizers. The common expectation was that students support their points with evidence or a rationale. For example, while reading the book Night, Teresa said, "The name of the book is Night. Night is a metaphor. Write down what you think night means in this book." After asking students to write down the meaning of night, Teresa asked, "Now give a specific thing in the book that provides evidence that night means what you wrote. Look in the book and find evidence." As students wrote, Teresa walked around and elaborated on the importance of evidence. She referred to a local high profile crime to emphasize her point: "Like in the trial, you have to give specific evidence."

Gave specific feedback. Teachers did not give many general affirmations, such as "good work" or "great." Rather, they made specific comments that built on students' own understanding of their work and encouraged students to take risks. For example, when helping students with their poems, Teresa said: "That is a total picture! Use the best word even if you're not sure how to spell it. Don't sell yourself short." "You have beautiful words, but it's hard to follow because it's not in lines. Show the reader where it should break." "You have great rhythm in your poem. If you break the rhythm, it better be for a good reason."

In interviews, students commented on the specific feedback they received from the teachers, making it clear to them where they needed to improve. For example, one student mentioned that he needed to add more detail to his writing; another said that she needed to work on word choice. The 7th graders in the split class mentioned that the smaller class size allowed them to get more in-depth feedback from their teachers. They liked when their teachers sat down with them for several minutes, working through a problem with their writing.

Asked open-ended questions systematically. Three of the teachers used dialogue and questioning throughout most of each class session. They sought to help students construct their own meaning by asking open-ended questions: "What do you think it means? What else could it mean?" "How do you know that?" "So what?" "What do you mean by that?" "Who disagrees and why?" "How is that connected?" The teachers' relentless questions were not getting at isolated facts. They asked series of questions to guide students in their thinking, to help them figure out a problem, a process, or a big idea.

Practiced critical pedagogy. Critical pedagogy, which encourages students to question the status quo and to think about the power they have to make change, was employed in the 8th and 9th grade classes (although the teachers themselves did not call it critical pedagogy). For example, when 9th graders were studying censorship, Teresa asked students whether they thought censorship was good and whether it made a difference if the censorship was used in war. She then asked them to defend their position and to write about their power to make change through words. In response to questions about censorship on Google, Teresa showed the students how different the search results were for Tiananmen Square, depending on whether you searched from an American versus a Chinese site, which made no mention of a protest. Teresa showed the well-known photograph of a young man standing in front of an oncoming tank and challenged students to think about how they might use the power they have to stand up for things they believed in. She told the class that the protesters were students, not much older than they were, and, making a connection to the book they were reading at the time, she asked them to consider what they would be willing to die for.

Mary used critical pedagogy as well, challenging students to question what the media says about science topics. While showing a video on genetic plant engineering, which included protesters against genetically engineered food as well as scientists responding to those protests, Mary pointed out that for every good change engineered there might also be a negative consequence. After students wrote down the pros and
cons presented in the video, Mary led a discussion on bias in the media and the controversy surrounding genetic engineering.

Summary. Participating teachers were consistent and systematic in the way they applied strategies to the authentic instruction framework. A matrix query of the number of strategies used in each class session showed that on average, six of these strategies were used in a class session. The snapshots provided here do not provide the landscape view, which would show pervasive implementation of authentic instruction, with differentiation judiciously used for any student who needed it. The following section deals with the assessment of tasks teachers assigned, the way they connected them to students' lives, and how students responded to those tasks.

Tasks Assigned

One major assignment for each class was scored for the task itself using the authentic tasks rubric. The mean score for all four standards combined was 9 on a 10-point scale. All of the tasks received scores of 3 (on a scale of 1 to 3) for construction of knowledge. A score of 3 means that "the task's dominant expectation is for students to interpret, analyze, synthesize, or evaluate information, rather than merely to reproduce information" (Schroeder et al., 2001, p. 4). The following tasks and accompanying work samples were scored:

Comic strip (7th grade English). Ruth connected the skill of writing dialogue to something familiar in students' lives - a comic strip. Students were given pictures from Calvin and Hobbes comic strips and were to develop a plot and write their own dialogue to go with the pictures. Ruth provided examples of the proper conventions for dialogue and the amount of descriptive detail expected. While generating ideas from students about what they could add to each frame, she wrote their ideas on a transparency, using the dialogue structure they would be expected to use. After receiving feedback from three peers, students revised their work. This task required creative thinking to develop an original dialogue, analysis and evaluation of one's own and others' work, and synthesis of critiques to complete revisions.

Essay revision (7th grade English). On the essay revision assignment, students were to choose one piece of their writing from the course and revise it, using three of six writing traits to improve it. They had to analyze and highlight the changes they had made and then meet with the teacher to explain how the changes helped them communicate to their chosen audience more effectively. During the conference, the teacher asked questions such as: "What trait did you focus on? How did that improve it?" "Why did you put that under organization?" "Why do you call it voice instead of ideas?"

Students had to think about their own thinking to explain their edits and to answer the teacher's questions. They had to analyze and evaluate their work; synthesize how the six traits could be used to improve their writing; create revisions based on that synthesis; and provide a rationale for the changes they had made. The assignment connected to students' lives because they actually sent their product to an audience they selected, such as the young authors' anthology, incoming 7th grade students, and a grandmother.

Significant quote (7th grade English). Using self-selected trade books they were reading at the time, students were to select a quote that was significant to them personally as well as to the characters in the story. Nancy gave suggestions of places they might choose, such as the climax of the story, the place where they finally understood the book's theme, or the reason for the title. Using proper citation format, students were to explain the context of the quote and why it was important. They were also expected to analyze the text for the author's writing style, pointing out word choice, repetition, or figurative language used and why that was effective. Nancy walked through an example that she had written, asking students for their critique of it and clarifying the task. This task required students to synthesize what they had read to identify not only a big idea but also the connection that idea had to their own lives. It also required them to analyze the writing, find specific writing tools used by the author, and consider the impact of using those tools.
Biggest challenge (9th grade English). On this assignment, students were asked to relate the theme of overcoming adversity (which they had been reading about in class) to the biggest challenge in their own lives. Students wrote very personal stories, such as watching mom and her boyfriend fight, trying to be strong for mom when stepdad was killed in a car accident, being afraid to go to the park because men had threatened to kill any black people there, losing both parents to cancer, being raped at 12 years old and not daring to tell anyone, and being sent to jail for gun possession. This assignment led students to consider critical questions in their own lives, and to construct new understandings of past events.

Evolution final (8th grade science). In science, students were asked to use their knowledge from the genetics/natural selection/evolution unit to answer questions on various applications of genetic engineering. The questions required them to compare and contrast, weigh options, make predictions and generalizations, and support conclusions made concerning issues related to genocide, natural selection and evolution. For example, one question asked, "Do you think that the benefits of genetic engineering outweigh its dangers? Why or why not?"

Student Work Samples

Student work in English for all four standards combined was scored at 8.8 on a 12-point scale. Construction of knowledge in English was scored on a scale of 1 to 4, with a mean score of 3.2. This score reflects that a moderate portion of the student's work showed interpretation, analysis, synthesis, or evaluation. It should be noted that these scores included special education students, who made up a different percentage of the scored work samples than their representation in class because teachers did not submit a complete set of samples. In both sections of first hour 7th grade English, 63% of the samples were from special education students, 18% in fourth hour 7th grade English, and 7% in 9th grade English (a science work sample was used for the 8th grade English/science course, to be discussed later).

Similar to previous studies (e.g., King et. al, 2004), the mean score of special education students was almost one point lower (0.8). Thus the mean scores reported on all but 9th grade English were likely somewhat lower than if the whole class had been represented. It should be noted, however, that special education students were not all at the lower end. Overall, 7 of the 16 special education students scored a 3 or 4 on construction of knowledge in English, which were better scores than 9 of the 49 general education students.

The mean score for all four standards combined on student work for the 8th grade science task was 7.2 on a 12-point scale. The mean score for scientific analysis was 2.4 on a 4-point scale. A score of 2 reflects scientific analysis in some portion of the student's work and a score of 3 reflects scientific analysis in a significant portion of the work. It should be noted that, unlike the English scored work, the science sample was a timed test and consisted of three short essays rather than one piece of writing. The rubric requires that the lowest level of work determines the score. So if a student did poorly on one question but well on another, the final score would reflect the lower work.

Like the English work samples, a higher percentage of science samples were completed by special education students (24%) than their makeup in the class (11%). Again, although their mean score was lower (1.8) special education students were not all in the lower end. Three of the five special education students scored a 2 or 3, which were the same or better scores than eight of the sixteen general education students.

Other in-class work and discussions. Additional in-class writing tasks, work samples, and discussions were coded but not scored. The coding hierarchy was based on Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001) linked to the authentic student work rubric. On Bloom's revised taxonomy, all levels were in evidence. For example, a discussion about how to understand cartoons was coded at analyze because students organized their ideas about cartoons and how to interpret them. The conversation in 9th grade English about censorship (described earlier) found students evaluating and defending their point of view. Their conversation about the Tiananmen Square protest was coded at evaluate because they were
making moral judgments about what is worth dying for. A discussion on Night by Elie Wiesel provided evidence of students synthesizing their understanding of the story to draw conclusions about it. Below is an excerpt:

Teresa: Who do you think died first - the violin or Iliac?

Student: He died because his violin broke.

Student: He broke the violin because his soul was broken.

Student: He died protecting his violin.

Student: The violin was all his heart. When it was smashed, he lost hope.

Synthesis was required on an 8th grade task in which students were to write a short essay, connecting the theory of natural selection to a paragraph in Night about a son leaving his dying father behind during the holocaust. These eighth graders were also asked to create and perform a rap poem, requiring them to interpret and synthesize what they had learned about the holocaust.

A notable aspect of class discussion (especially in science) was the high engagement of students and the prevalence of spontaneous (unsolicited) questions by students, many of which demonstrated higher order thinking. Based on the results of a matrix query, students were most likely to ask spontaneous questions when the teacher was building on students' expressed interests, pausing for discussion during read-alouds, practicing critical pedagogy, or asking why questions. Students asked questions such as the following:

* What if something was known 1 00,000 years ago but we don't know it now. Is that considered known?

* If I make an observation by comparing the two photos, is that evidence or a hypothesis?

* How does this discussion connect with the holocaust?

* Is there really any extinct species since we evolved from them?

Substantive conversation was the goal in these conversations and it was partially achieved. Students were very engaged in class, and conversations frequently took on a life of their own without prompting by the teacher. Students, however, frequently made short comments with little elaboration.

Summary. Students were given tasks that connected to their lives outside the classroom and that challenged them to think critically, produce elaborated written communication, and engage in substantive conversation. Students' average work in English, while not at the highest level of the rubric, was identical to that found in the RISER study (Hanley-Maxwell & Phelps, 2003) for students who were given highly authentic tasks (8.8 of 12 on the four standards combined). Special education students as a group scored lower than their peers without disabilities, but all of them did the same challenging work as the other students and some did as well as their peers without disabilities. (Again, similar results were found in the RISER study).

Results on the science work samples were lower. Unfortunately, samples from only one major science task were available, so it was not possible to determine whether this was a pattern or simply one assignment that required too big of a leap in students' thinking. The level of student engagement in the observed classes, including science, was quite striking and led me to look at the bigger picture to understand what was happening in the classroom.
Interaction of School Culture and Authentic Instruction Framework

An analysis of contextual observations revealed that the culture of the school was intertwined with the instruction being used. A climate of respect enabled teachers to focus on student learning, while at the same time, the focus of authentic instruction, which holds high expectations for students, engendered a sense of respect between teachers and students. The principal's high expectations and high regard for the teachers and students, the passion and persistence of the teachers, and the use of authentic instruction appeared to interact and create an environment conducive to authentic learning. When referring to the expectation for higher order thinking, the principal remarked, "You have to believe that kids can think that way. It's become a part of how they teach. To ask questions and get kids to ask questions, it's changed the whole way they deal with their work and their thinking." Authentic instruction itself seemed to foster respect because of the expectation that all students would do authentic intellectual work.

The culture of respect led to few discipline problems in classrooms observed, which made it possible to focus on authentic instruction. During the five weeks in the building, I observed only a few minor behavior incidents. Behavior problems did not interfere with the flow of class and were handled in a respectful unobtrusive way. The little misbehavior that did occur was handled privately with the individual, instead of during instruction. A no-tolerance for bullying policy was in place school-wide, and I did not observe a single instance of it in the hallways, classroom or library. (Bullying was, however, mentioned in a couple of the work samples that were reviewed).

As part of the contextual analysis, I coded behaviors that demonstrated teacher dispositions. Based on that analysis, every teacher participant exhibited deep respect for students and for each other; genuine caring for students; a positive outlook on students, the work, and the ideas; passion and enthusiasm for the subject and the big ideas; focus on empowerment of students; persistence in working with students until they got the concept; delight in students and their ideas, but at the same time, high expectations for students to support those ideas; and flexibility in thinking - taking unexpected ideas or questions and using them in the lesson.

Conclusions and Recommendations

Teachers in this study worked very intentionally, passionately, and collaboratively to implement research-based practices and to meaningfully engage diverse groups of students. Findings indicated that teachers had integrated authentic instruction so completely that almost everything they did reflected the approach. It seemed to be a different way of thinking. At some point, these teachers had let go of the concern about covering material and instead focused on authentic learning. The strategies teachers used were not new, but their pervasive use of such strategies in support of the authentic instruction framework was remarkable.

Strategies that seemed to support authentic intellectual work included asking open-ended questions, expecting students to provide evidence to support their answers, asking students to write down their thinking, building on student questions, modeling the thinking process, and providing specific feedback. Teachers managed to foster high quality intellectual work for a significant portion of class time, expecting all students to complete tasks that required construction of knowledge, disciplined inquiry, and value beyond school.

There was actually very little difference between how teachers treated students with and without disabilities. Differentiation, such as scaffolding and flexible grouping, was provided to anyone who needed it. Students without disabilities were, on average, somewhat more successful in the work than those with disabilities, but the important fact is that students with disabilities did the same work. Work was not watered down for those with disabilities.

Previous research (Newman, King, & Carmichael, 2007) has identified the importance of administrative leadership to foster the kind of effort described here. The leadership provided by the principal undoubtedly laid the groundwork for the significant effort put forth by these teachers to promote authentic learning. The principal did exactly what Linda Darling Hammond (2010) said was essential to enable excellent teaching:
to provide time for teachers to work together, design and implement professional development programs and learning communities, provide coaching and mentoring, and encourage peer support teams. The principal of the selected school was an exceptional leader in this regard. She had high expectations of the faculty but also demonstrated high regard for them. All of this contributed to the culture of respect that fostered authentic learning in this setting. Importantly, this has been maintained over the years with no more resources and just as many challenges as most other public schools.

The school observed in this study contrasts sharply with schools described in some studies on higher order thinking and authentic instruction. For example, Dennis and O'Hair (2010) described a largely unsuccessful attempt at authentic instruction in three high schools that did not have the kind of leadership and school-wide implementation described in the current study. It was up to individual teachers to create authentic classrooms without the necessary professional development and school organization to support such an effort. Similarly, Fischer et al. (2011) found that administrative pressure to cover material in preparation for standardized tests led to very little promotion of higher order thinking in the high school classrooms studied. The current study documents that significant authentic instruction can take place in the context of administrative leadership, professional development, and support for collaborative work.

Based on the findings in this study, secondary schools that seek to foster high quality intellectual work are most likely to succeed if school leaders make a commitment to focus on it over a period of years, and provide time and professional development for teachers to develop their skills in collaborative teams. Use of the rubrics for authentic instruction, tasks and student work would provide a framework for this focus. Administrators and teachers need to be willing to let go of coverage and concentrate on deep learning. In addition, schools that seek to be inclusive must challenge students with disabilities to do the same rigorous work as their peers without disabilities.

Research is needed on how best to prepare both general and special education pre-service teachers for authentic and inclusive teaching. Studies might focus on how teacher educators can prepare pre-service teachers to integrate a wide variety of research-based strategies into the broad framework of authentic instruction. At the same time, research is needed on the connection between fostering high quality intellectual work and producing graduates with the skills needed for the 21st century. Only when administrators and policymakers are convinced of this connection will widespread systemic change occur.

References


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