

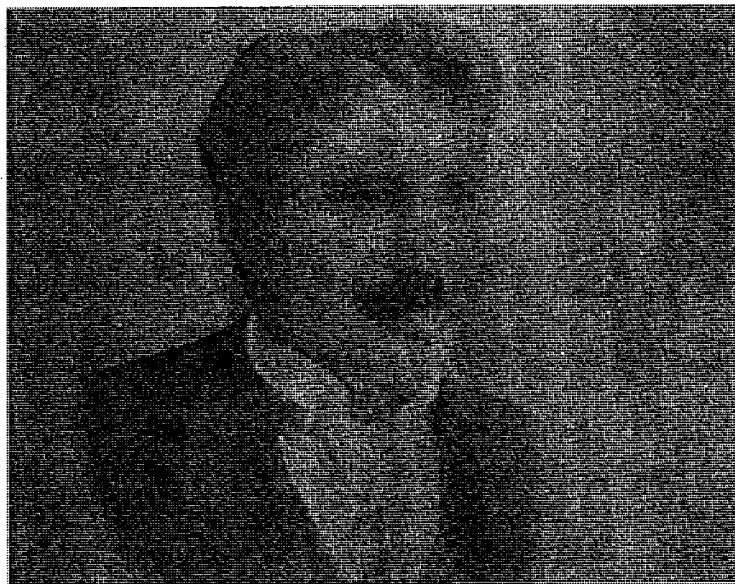
Julius Deetken
J U L I U S D E E T K E N —
P I O N E E R D R U G G I S T

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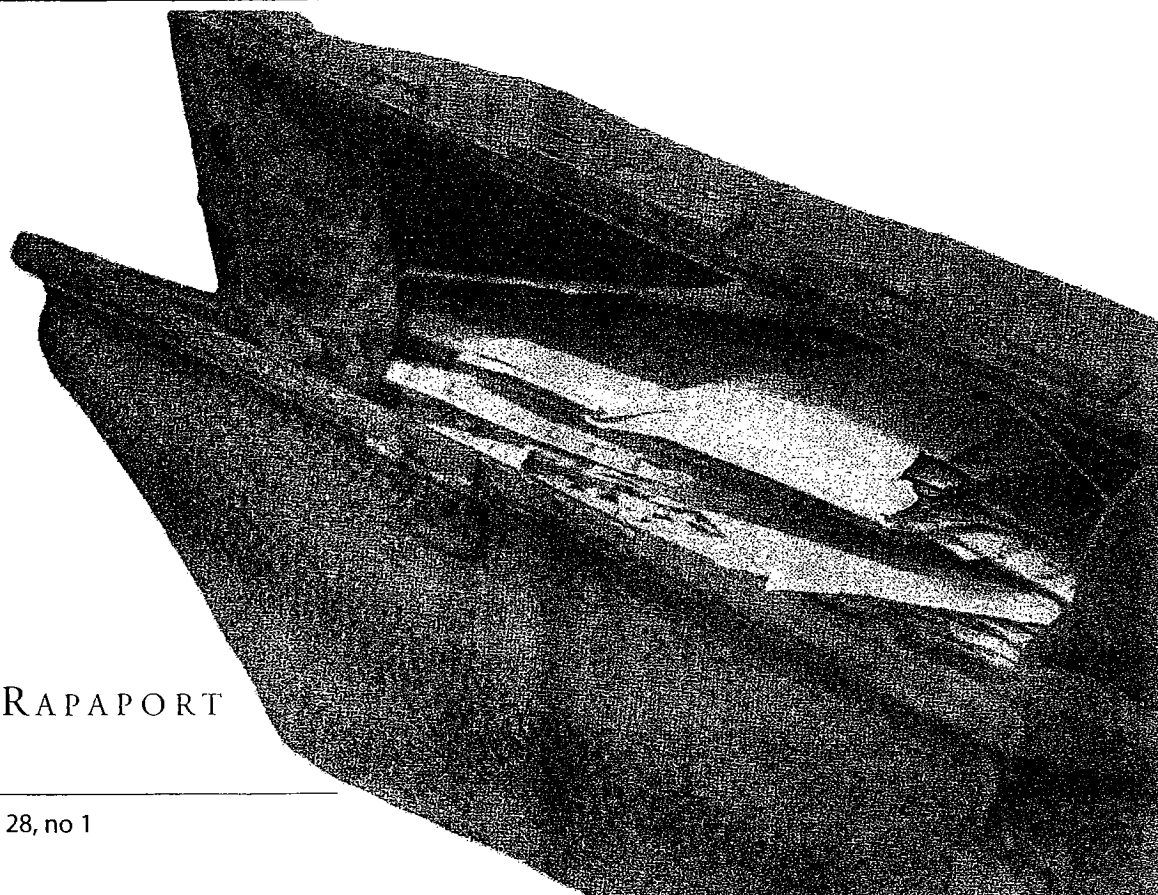
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AN APPLICATION OF THE ENRICHMENT
CLUSTER MODEL TO A HISTORY CLASSROOM



BY DAVID RAPAPORT

Edward Thorndike may be counted on to say in few words what amounts to a highly complex idea. He once said that, with learning as with any activity, ability must be supplemented by interest or desire. "If we wish to learn a certain thing, we must arouse adequate interest . . . we must transmute this general wish into an interest that will carry us to and through the detailed activities necessary" (Thorndike, 1935, p. 85). His straightforward conclusion was that, in planning any educational endeavor, it is important to account for the level of student interest. "It is important know whether the student has it, how strongly he has it, and when and how he has it" (p. 85).

A project in a San Jose, California, middle school was imbued with Thorndike's principles, placing them at the forefront of key decisions affecting instructional design. These decisions involved how to create a structure that enables students to learn the skills necessary to carry out many subprocesses requiring prerequisite knowledge and, at the same time, includes an absolutely authentic experience with real-world consequences.

* * * * *

Twenty-five years ago, in the late morning on a breezy summer Sunday, the Santa Cruz flea market was winding down. I had spent hours wandering around the legendary swap, looking for musical instruments, especially guitars, my new passion. Just before leaving empty-handed, I noticed a collection of old papers spilling out of the top of a brown leather bag that resembled a doctor's bag of some sort. It was sitting at the foot of a gold and green blanket holding down one corner. As I walked past it, I looked down and was drawn to this bag, as I thought there might be something interesting in there. The bag's owner, sizing up the day's meager efforts and seeing my interest, offered it to me for a remarkably few dollars. I agreed even before taking a good look inside. When I returned home, I took a closer look and saw an aging collection of letters, official documents, and family mementos. To my surprise, there were personal stories, family timelines, and even locks of hair from family members dating back generations.

I hung on to this object as I moved from the University of California dormitories to a residence in Santa Cruz and then from place to place, back to my birthplace of San Francisco, even including a brief journey to New York City, bag in tow. Poking around in it one day, I saw a few documents and records that I knew represented a gold mine of primary documentation of the city of Deadwood, South Dakota. I never knew what I was going to do with this object, but it became part of my loose collection of odds and ends.

In the late 1990s, I became a middle school teacher and thought that there might be some way to share

this curious object with my students. Just this year, through incredible effort on the part of the school's parents, I applied for and was granted funds to create a research laboratory in my classroom. Composed of five wirelessly networked Apple computers, a printer/scanner, and a computer projector, this new research platform allowed my students and me to explore the world around us unfettered by the typical boundaries often found in classrooms. It was time to investigate what exactly was in that decaying leather bag.

I designed a project in which this small brown bag would be the centerpiece of an historical investigation. Atypical of many instructional experiences in middle school, this project would run for several months, yet easily sustain student interest. I used principles of instructional design to build on students' natural curiosity, and I tried to interfere as little as possible as they navigated through their own interpretations of the documents. I had little notion of what would happen when these amazing students explored incredibly diverse research paths based on their personal, individual approaches to these artifacts. By properly integrating technology that worked without unnecessary and time-consuming glitches, students succeeded in shedding years of dust from the story of the original owner of this bag, a pioneer druggist from the Black Hills of South Dakota named Julius Deetken.

Instructional Design

Primary Materials Promote Student Discovery

Of utmost importance to the success of this project was creating the basic environment in which student

learning would take place. Many determinations were made involving instructional design, but none more important than the decision to maximize student contact with the primary materials while minimizing prescriptive responses to student inquiries. As a stimulus for student learning, the uniqueness of this item and its contents exemplify a problem-based learning (PBL) opportunity (Gijsselaers, 1996). Although Schmidt and Moust (2000) have pointed out that the specifics of PBL widely vary, its three most common features (Wilkerson & Gijsselaers, 1996) were evident in this project:

- It was student centered.
- The instructor assumed the role of facilitator, rather than disseminator of facts.
- The artifact itself served as the initial stimulus and framework for learning.

The extreme rarity of the primary data meant that the learning materials students encountered were of the highest quality, fitting a PBL theoretical model that predicts greater achievement as a function of providing high-quality materials, accommodating prior knowledge, and modifying the instructor's role (Schmidt & Gijsselaers, 1990).

In order to behave as historians, students had to discern that this was an actual research experience taking place as part of class, not a role-playing experience. They had to learn that their interests and talents and those of fellow group members held the key to the research opportunity in front of them. Things weren't going to be done for them, and they were being provided an opportunity to do research that had never been done before. They had to react to hearing

that there were no specific responses to many of their questions because no preprogrammed answers existed to questions about previously unknown documents. I suggested to them that they develop questions they would most like answered and then answer them, perhaps with the help of other researchers and any other resources available to them. By their comments and reactions, especially to the idea of working on a project for the entire school year, I quickly realized that this was different from what they were used to.

Ensuring Alignment With Standards

Also of vital importance to this project was achieving the principle that, beyond having learners acquire specific standards-based research skills and learn content themes aligned to state standards involving Westward migration, no prescriptive teacher-formed goals existed at the outset of the project. This project demonstrated that student-led inquiry does not diminish an instructional event's degree of alignment to standards. In fact, this project embedded many important critical thinking standards in the form of continuous writing assignments, opportunities to apply logic and methods of social inquiry, and ongoing oral presentation requirements. Direct engagement with the public fostered an authentic learning opportunity, highly desired by the educational establishment, making the target audience an actual one for whom solutions to the students' problem had real-world significance (Renzulli, 2000).

Students were required to develop the entire research project for themselves. Adhering to basic principles of constructivism (Edwards,

Gandini, & Forman, 1998; Fyfe, 1994; von Glasersfeld, 1996, 1995), student responses drove the various research paths determining in large part how portions of class time were spent and how content was processed. Because students documented their efforts through written and electronic archiving and photography, their interpretation of artifacts became the actual written history in the form of a self-published book. This project assumed that student experts, once trained, would be the best qualified to make meaningful determinations as to the historical significance of the contents of the bag.

Classroom Management

Many classroom-management techniques had to be employed to make this project function effectively, with none more important than considering how to avoid my own desire to control the shape and scope of the research. At all times, I had to emphasize student-led inquiry and avoid "rigging things" so that students would be guided to a specific predetermined conclusion. Although I knew that no such conclusion existed, contingencies had to be explored so that appropriate responses to predictable questions could be constructed that would allow students to steer the project while still affording the necessary level of assurance that students learned the situation-specific skills necessary to move forward. One important decision involved forming a consistent response to the questions "What does this document mean?" or "What do we do now?" I determined that a simple response—"What would a historian or a scientist say or do?"—carried with it a nice affective comparison of student to professional and, with it, the desired balance that

allowed students to preserve their own research hypothesis without adding my own bias.

Other classroom-management issues involved how to ensure reliable physical data recording. Further, contact with real-world professionals had to be managed sensitively so that numerous students didn't all call the same person seeking answers to the same questions. Because of the time constraints of a single school year, effective groupings in terms of size and role were of paramount importance, enabling the 150 student researchers to be able to attain the various research goals they created as each document revealed its secrets.

Model Technology Classroom

This project was possible in large part because my classroom was selected to be a model technology classroom, a demonstration site for teachers to see how to incorporate technology meaningfully into learning situations. A group of five wirelessly networked Apple computers with high-speed Internet connection were installed along with a computer projector and printer/scanner combo. Despite our best efforts, we couldn't damage or make these systems fail the entire year! Working with new equipment helped us avoid the frustration that so often befalls those willing to take risks using technology to support student inquiry. Students also felt special working with brand-new computers. They observed rules concerning security and personal downloading.

Data Storage and Retrieval

A major consideration was how to make it possible for five unique classes of students to interact with one delicate, decaying historical

object. At the same time, processes had to be put in place so that one class or student could easily learn what another class or student had been working on, providing an ongoing communication platform for them to share discoveries and avoid duplication of effort. Because of the large number of researchers involved, a data storage plan that would facilitate efficiency across all classes had to be designed, one that allowed work to be preserved, easily accessed, and built upon.

Simplicity proved to be the key to our success. A single physical binder was used to store data sheets—nothing more than a record-keeping device that allowed students to document specific information about each piece of paper they retrieved out of the bag. Data sheets identified the particular class and research team that was responsible for the document, giving researchers the chance to name the document for archival purposes and place into the record a detailed description that would eventually be transferred to an electronic file for uploading to a Web site. Also present on the data sheet were notations to determine whether the document had been scanned and, if so, the name of the scan file so that it could be easily retrieved when needed.

Having all the information for the entire project in one place proved to be an invaluable organizing system, making the research process virtually immune from unnecessary and time-consuming duplications of effort and resulting frustration. It was easy to see which documents were available for study because unique, detailed records existed for each one, dramatically reducing potential confusion.

Confusion was important to avoid because, amazingly, more than 150 unique documents were pulled

from that little bag. Some were voluminous, including an extremely rare and amazingly well-preserved 22-page original title to the property in Deadwood itself. Some documents were unidentifiable and remain available for further research. Seemingly overnight, three archival binders quickly filled with student work, teeming with primary documents in protective sleeves. These items were made as accessible as possible across all five classes to ensure that students had maximum contact while preserving document integrity and condition. To achieve this, a single archivist was the only group member allowed to pull out new documents. But, once a document made its way into a binder, any student could retrieve it for study or examination. Easy access to documents discouraged a feeling of competitiveness among one group of students who may have uncovered papers of some obvious importance—citizenship papers, for example—versus more mundane objects like an old receipt. A further rationale for making them easily accessible was to prevent students from feeling like there were traditional obstacles to working with these materials. Once students learned how to handle documents properly, they were available for study. After all, how can a researcher make meaning from a document that he or she cannot touch or manipulate in his or her own unique way?

The First Day

The initial days of the project are worth a brief mention for the sake of assisting other teachers interested in replicating any the approaches taken in this study.

The artifact was introduced to each class in the following manner. I gained the attention of the class and

placed the bag on a table at the front of the class, visible to all, and asked students, "What is this?" Pausing for a few moments, students asked whether I was feeling okay. Assuring them that I was fine, I waited until someone in each class ended up saying something to the effect of, "Well, I guess the best way to find out what it is to open it up and look inside!" That comment became the perfect cue from which a discussion was triggered about how one might look in the bag without causing chaos. What were various methods that could be used? I finally asked, "How would a scientist look into something like this?"

It took an extended waiting time until a student in each class offered the opinion that a research team could be one efficient method for looking into this bag if one were serious about doing so. Assuring the classes that we were serious about doing so, a discussion led to building the five teams per class, beginning with students actually applying for research positions with a standard application similar to the manner in which adults apply for work-study jobs.

I tried from the beginning to adopt a facilitative role. I only laid out the underlying features of the research process, something I called the "game rules." By having students initiate the plans and decisions on how to conduct the research, the ideas were theirs in origin and in responsibility. These research teams or clusters were staffed by the same students throughout the duration of the project.

Theoretical Rationale

A Jigsaw Classroom

Based on the work of theorists Aronson (1978), Bloom (1976),

Cohen (1987), and Renzulli (1994, 1977), tasks were jigsawed by these research teams (or enrichment clusters) building on individual approaches to the primary data being studied. The research teams were formed employing principles of an instrument called the Interest-a-Lyzer (Renzulli, 1977). Students literally needed to apply for jobs within the research clusters. Gathering an inventory of interests not only helped identify student strengths, but greatly assisted in the forming of teams based on shared interests, diversity, and personal goals corresponding to the major dimensions of Renzulli's Total Talent Portfolio Model (1997) referred to as abilities, interests, and style preferences. Students were treated as research professionals coming together to bring their talent to bear to solve unique real-world problems: the unearthing of the life of Julius Deetken.

Assumptions transferred from Bloom's (1976) model were those involving the variance explained by specific knowledge, abilities, or skills that are essential prerequisites for the learning of a particular task. It was assumed that given adequate instruction and accommodation of prerequisite skills, all students would be able to accomplish the tasks that were required of them.

Ensuring Possession of Prerequisites

Gagné (1979) proposed that essential prerequisites are component skills that must be learned prior to, or at the same time as, learning the target outcome if the total task is to be learned and performed correctly. In this project, prerequisites were defined as the precise skills or subordinate actions of a situation-specific

demand on the learner. Each specialized team member had to learn certain prerequisite skills without which performance of the key inquiry experiences would have been exceedingly difficult, if not impossible. One set of subskills required that students learn the proper techniques for preserving and handling rare artifacts. Another involved learning effective search strategies and keyboard and software operations. Specialized skills included the nomenclature and operation of the digital cameras and computer uplink software. Others learned the complex skills of high-resolution scanning and creating shared files accessible to all researchers. Others had the opportunity to learn metacognitive strategies involving how to absorb large amounts of information and how researchers sort through varying stimuli to determine future actions. Shared across all groups by demonstration, all students were exposed to each set of skills to a varying degree, with at least one in actual possession of the proper skills necessary to do a subsequent task or step in the research process when called upon.

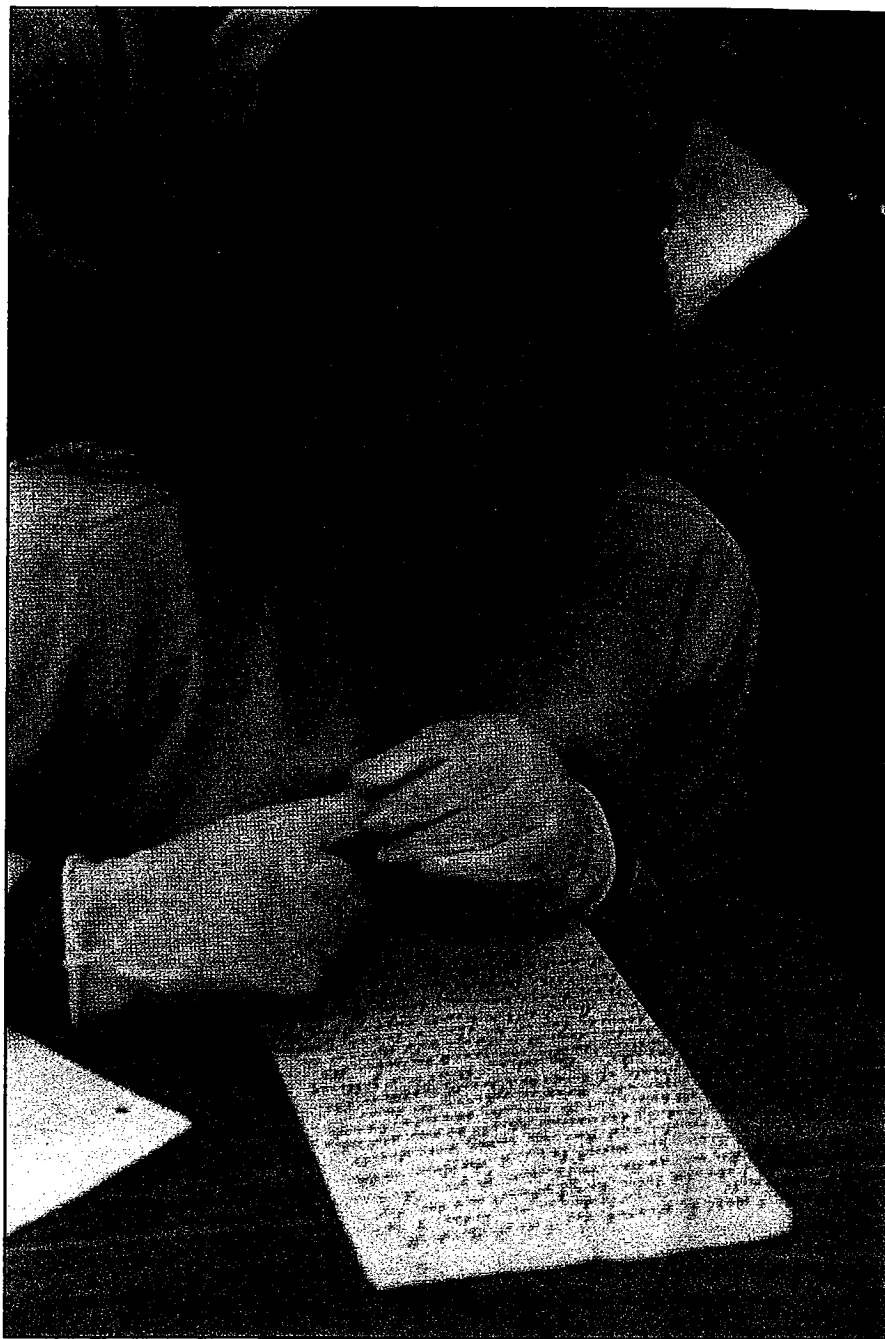
Instructional Alignment

Cohen's (1987) instructional alignment model reminds practitioners that, in order to define an outcome's prerequisite components, the instructional designer must be able to identify the outcome's critical features. It follows that, if an outcome's critical features assume certain prerequisites, then the degree to which those prerequisites are present and activated will determine the quality of performance on the criterion variable. If this is true, then intervening variables such as generalized aptitude will have less of an effect. Ensuring pos-

session of prerequisite component skills predicts a clear and convincing difference in achievement for all students, reaffirming the goal of a negatively skewed curve following group instruction over a bimodal distribution or normal distribution of typical achievement in education.

One challenge I faced was ensuring alignment in a fluid learning situation. I had to be certain that learners in each group possessed prerequisite skills at the critical moment during the research process that would be far enough along to occasionally feel the frustration of a poor decision, but never far enough to reject their team goals or their overall role in the project. Making this task all the more challenging was the fact that outcomes could not be crafted ahead of time. I couldn't make prescriptive instructional events involving document interpretation because I could not make their discoveries for them; I had to teach them (by asking them) what experts do in a situation in which they discover something and how they might make evaluations within the research process to figure out what to do. Because these evaluations and plans were student-led, I had the challenge of learning the stimulus conditions students were creating so that I could ensure that the proper foundation was laid for further exploration.

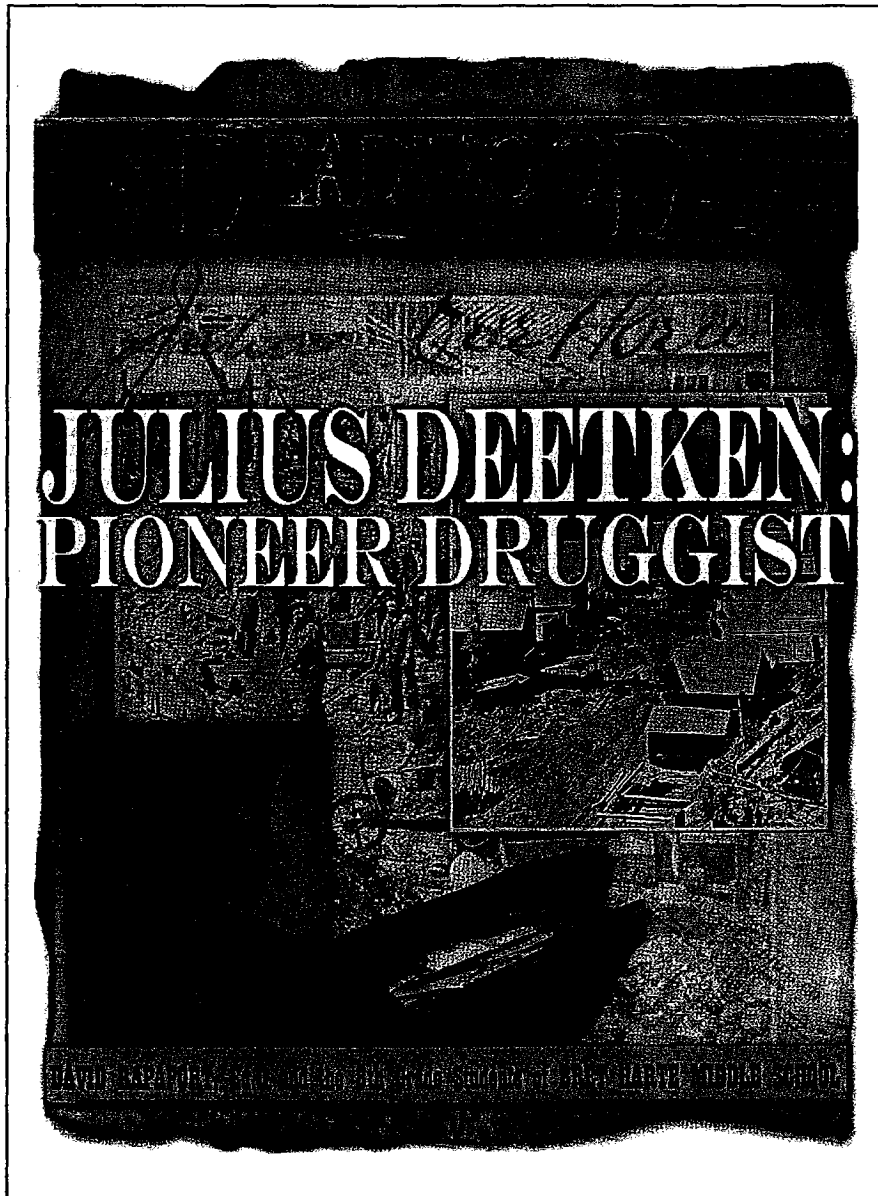
One memorable exchange occurred when a learner wanted to translate an 1860 letter that was barely legible and written in what turned out to be an archaic form of German. She audibly evaluated her choices, contemplating just how long such a translation would take and considered the value of the translation to the project as a whole. Just getting that response from a middle-school-age student proved to me that



EIGHTH GRADER DAISY AGUILAR ARCHIVES A LETTER FROM JULIUS DEETKEN'S PHARMACY BAG.

these young researchers were capable of asking the right questions and learning how to operate in close alignment to real-world adult researchers. As one student said with perfect transparency, "We're becoming researchers because we're becoming researchers."

After learning essential prerequisites, learners demonstrated an amazing capacity to apply these skills effectively throughout this project. The sheer number of researchers, performing effectively, significantly shortened the time needed to make major discoveries, compressing



THE COVER OF THE 40-PAGE, FULL-COLOR BOOK PRODUCED BY THE 8TH-GRADE STUDENTS OF BRET HARTE MIDDLE SCHOOL DOCUMENTING THEIR RESEARCH.

accomplishments into day-to-day expectations.

Applying Enrichment Cluster Theory in a Classroom

Enrichment clusters served as the ideal framework for learner exploration (Reis, Gentry, & Maxfield, 1998). Learning teams were formed based on principles of instructional

design that emphasized student inquiry so that students would be able to construct for themselves unique research opportunities and paths of discovery. Alignment to actual research experiences was the critical feature of instructional design, which began immediately when students had to apply in writing for jobs as members of a research team.

After looking at the applications

and obtaining an inventory of interests, student teams were formed to build on individual strengths. Five research teams consisting of six members were formed in each of five classes. Writers began analyzing and outlining the documents. Archivists took responsibility for preserving the collection. A photographer and media specialist worked together to record the collection digitally, creating an electronic portfolio of these rare items while photographing the process as students went about their work. Planners got students focused on different avenues of research while research associates made direct contact with researchers, historians, and family members in an attempt to enrich the collective learning experience. In a very short time, these 150 researchers assembled an enormous amount of information on Julius Deetken.

Writers were more often than not students with exceptional leadership skills who could demonstrate understanding the "big picture" of the research process. They were not always the best writers, but their goal was always to make sense of what each member of the group was studying in order to communicate the effort to the intended target audience most effectively. Students learned to become familiar with the intended target audiences: the research community, history community, and regional political structure. Writers, with the assistance of the entire research team, composed a detailed written summary of the research process, including, but not limited to, major findings, obstacles, and research methods employed.

Archivists worked directly with the primary data. They were the ones who put the white gloves on, literally. With so many researchers, a strategy was necessary to protect the artifacts

without unduly limiting the amount of human contact with them. To ensure that the artifacts were not harmed during the research process, archivists played a key role in their direct handling and storage. Preserving the artifacts' original condition and integrity was of ultimate importance; therefore, the archivists learned specialization techniques in preservation processes and evaluated which techniques could reasonably be used in this case (hermetically sealed, humidity-controlled rooms were impossible, for example).

Photographers were responsible for photographic documentation of the research process. Before they could do this, they had to attend a specialized training in camera operation and care and how to upload photos into a computer. They labeled each photo and evaluated their quality for inclusion into publications. They were responsible for helping another student develop a planned multimedia collaborative presentation as part of a culminating activity. They were also responsible for working with the archivist and others to preserve the digital record of the collection. Their photos were placed in brochures sent out to key contacts in the historic, political, entertainment, and teaching communities.

Media specialists were students responsible for assisting with all computer and media-related technical activities, which amounted to an extensive component of this project. They were responsible (along with the archivists and photographers) for transferring content items into the digital realm for preservation, which required specialized knowledge in scanning. They were responsible for working closely with the archivists and writers to provide digital records of the research efforts. They proved to be

good troubleshooters and were able to deal with novel challenges based on their repertoire of acquired skills.

Research associates actually contacted the outside world. Because of the number of students involved, it was specified that each group would have only one person designated to make contact with adult professionals via telephone. Because there were five groups of six students each across five classes, a full one fifth of students had direct contact with an adult professional. They had to document their personal conversations, working closely with the planner and with all other group members, and incorporate relevant findings into the final research report. They were flexible and able to multitask. They possessed strong organizational skills that were essential for the many subtasks involved. They doubled as presenters based on their being able to transmit the intimacy of personal conversations with the outside world. The presentation, being roughly 7 months from project inception, necessitated incorporating elements of the entire research effort, including key findings. The assessment process alone fostered deep reflection and insightful analysis of the entirety of the project, thus giving ample opportunity to resolve elements of the final products and bring closure to several major initiatives undertaken by students: publication, data transmission to our Web site, and a display tailored for Deadwood.

Each team interacted in its own unique way with the bag's contents, and each individual played a key role in the analysis of the contents by virtue of the highly specialized nature of his or her work and the group's small size. There was high interest in finding a document that would shed more light on the story of the bag's owner and a strong desire to pull as

many documents as possible in the name of discovery. This was an area where I had to monitor student behavior closely because, before a new document could be pulled, several important steps had to take place: labeling and documenting the artifact, placing a short description together with the document in a special binder to preserve it, scanning the document into a digitized library record of the collection for later uploading to a Web site, archiving photo documentation of the entire effort, preparing written summaries of each group's findings, and noting different steps and variations in the approach taken to solving problems and overcoming obstacles.

Student-Led Inquiry

Because each student participating in the project made a contribution within the enrichment or research cluster, it was critical that he or she master the situation-specific skills of scientific inquiry to establish research paths that would prove more fruitful than frustrating. As documents were delicately pulled from this bag one by one, students quickly learned that there were real-world consequences to each action they took, as the case of whether to pursue a letter written in archaic German pointed out. Students had to become experts in assessing the probability of success in investigating one content area versus another in addition to investigating the historical significance of each artifact. Unique data points and investigations were revealed solely based on the individual interpretations and decisions made by students.

Therefore, no lessons on document interpretation were prepared in advance by the instructor. Instead, I

had to coach and attempt to qualitatively improve the level of performance throughout the length of the project (Renzulli, 2000). When I was not directly teaching a skill, I read student research reports, looked at photographs, assisted archivists, supported researchers honing search terms, predicted the needs of various group members, and allowed groups to struggle along their own research paths without cueing them toward a single “correct” interpretation or potential solution. I listened to determinations of the value of documents, shaping student behavior toward criterion performance. What was that criterion performance? Simply put, it was student response to the following inquiries:

1. What do the people with an interest in this area do?
2. What knowledge, materials, and other resources do they need to do it in an excellent and authentic way?
3. In what ways does the product or service being used have an impact on an intended audience? (Renzulli, 1994)

Linking Enrichment Clusters, Triarchic Theory, and Teaching

Renzulli’s (1994) three questions share characteristics with elements of Sternberg’s triarchic theory, which poses that patterns of abilities fall along three major dimensions: analytical abilities, creative abilities, and practical abilities. Sternberg’s contribution to the Deetken Project is the simple applied notion that students can improve their performance if taught in a way that is appropriate for them, building on these dimensions as an expression of their interests, one

might say. In practical terms, instruction need not be individualized across ability patterns, but kept more or less uniform across Sternberg’s three dimensions in order to build on both learner strengths and weaknesses, the intent being to make the most of strengths and correct weaknesses (Sternberg, 1998). Blending Renzulli’s approach with Sternberg’s theory and subsequent emphasis on the problem-solving cycle, which some may refer to as an inquiry model, one is provided with a useful framework from which to create learner-appropriate instruction.

Sternberg (2001) also casts a spotlight useful to practitioners on what he terms “intuitive conceptions” by criticizing instructional programs that fail to engage processes designed to extinguish such conceptions when they actually impede learning. This is a valuable theory to consider in light of Renzulli’s second question cited above and the need to teach essential prerequisite skills necessary for mastery of a particular stage of learner performance. Defined as preexisting knowledge that predispose individuals to think and act in particular ways, Sternberg has argued that the classroom is heavily influenced by these students’ “intuitive conceptions,” which might be otherwise referred to as variations in essential and supportive prerequisite component skills (Cohen, 1992; Gagné, 1985). Sternberg’s observations underscore the practical need to teach situation-specific essential prerequisites and to ensure that learners possess such prerequisites in particular when they are an essential element of a subsequent learner performance. Those taught the essential skills that predict achievement of a particular situation-specific outcome will achieve that outcome in greater proportion than

those whose only hope of achievement is random variation. In this project, if students did not possess essential prerequisites, valuable learning opportunities would have gone unexplored and new historical analyses could not have been undertaken.

Assessing Learning

Observations

Formal skill assessments were designed to ensure mastery of subskills along a timetable that made sense for the project as whole. These assessments took the form of directly observing a student or group demonstrating proficiency at some skill. It made no sense to teach image scanning to a group that had not taken the first steps of recording data, such as properly filling in a data sheet. Because prerequisite skills for each of the six aforementioned research positions varied based on the unique requirements of each position, it was essential that mastery of those subskills be detected before a demand was made upon which those prerequisites depended, including the summative assessment.

Considerable effort went into structuring direct teaching of each subskill, detecting the acquisition of the skill and seeing the skill used appropriately as the prerequisite for a subsequent learner action.

Student Reports

For periodic progress reports and to prepare students for the summative oral report, regular formal oral discussions required student groups to be publicly accountable for their work, requiring a larger view of the project than simply one person’s individual contribution to it. The summative

report consisted of a presenter orally sharing findings, often with the use of accompanying slides prepared by a research technician. Beyond a simple self-assessment, these remarks were weighty, often self-effacing descriptions of how students learned to incorporate day-to-day decision making into a long-term project, taking into account the varying learning rates and learning styles of the group members. Students reported this project to be a success chiefly because they made it so. Writers, with the assistance of the entire research team, composed a detailed written summary of the research process including, but not limited to, major findings, obstacles, and research methods employed. This summary was invaluable to the presenter. The writers who composed journals themselves were valued indeed; their dedication provided huge dividends for groups seeking specific recollections of their discoveries and reactions.

Electronic Longitudinal Files

As mentioned earlier, five computer research stations constituted the main technological resources available to students. Student groups were given a dedicated work station and told to save their files in a certain way to make them easily retrievable by the instructor. By having research teams work at the same computer station throughout the project, they could easily follow up previous work without the fear that often accompanies working in computer lab situations when other students alter or neglect to respect other student work. This setup facilitated assessment routines because of a portable device that was used to copy and retrieve files at the end of an interval, allowing me to assess student progress longitudinally.

I simply had to copy a single file from five computers to a handheld file storage device (called a flashhopper), making an entire class' work available for subsequent evaluation. I could assess progress by comparing work over time done by various members of the group responsible for expected changes in the data files as their work progressed. Being able to determine progress quickly by looking at individual files enabled me to assess individuals' and groups' learning rates rapidly so that tutoring or coaching strategies could be applied.

Adding to the beauty of this filing system was the fact that any group's work from any period could easily be found and authorship traced based on the organizing of file names. A file name "PIG2 Letter to HBO" meant that the original file called "Letter to HBO" was created by a student from first period and that the original could be found on Computer 2 because, across all classes, all Group 2 work was done on Computer 2, all Group 3 work would be on Computer 3, and so forth.

What Did We Learn?

It turns out that important elements of Julius Deetken's entire life could be reconstructed simply by studying these papers and deepening our familiarity with the region and its people. Miraculously, since obtaining this object some 25 years ago, the advent of the Internet has made this type of research not only possible, but fruitful. In our case, within a matter of minutes, students linked to biographical records dating from 1915, which were scanned, edited, and electronically archived by researchers who publish comprehensive electronic records outlining the genealogical history of South Dakota. To their

delight, within the very first moments of searching, students found a detailed biography of Deetken.

The youngest of six children, Julius Deetken was born in Heidelberg, Germany, on October 27, 1844. According to the key biography obtained from a book entitled *History of the Dakota Territory* by George W. Kingsbury, Deetken had intended to prepare for the Ministry of the Lutheran Church; but, because of his father's death, he abandoned his preparations and entered an apprenticeship in a pharmacy. He left Germany in 1867 for America along with his three brothers. He settled first in Pottawotamie County, Iowa, in the town of Council Bluffs, where he clerked in drugstores.

Proof of Deetken's residency in Council Bluffs was obtained after Federal Census data from 1870 was retrieved from the National Archives. In one of the more poignant sections of Kingsbury's biography, students learned that Deetken came to the Black Hills by walking most of the way along with those who were driving teams. He arrived in the brand new mining town of Deadwood, where he resided continuously from 1876 until his death in 1915. His was the first exclusive drugstore in town, opening in a log store just below his subsequent place of business. He consolidated his interests with those of a man named Edward C. Bent.

Included in the bag were all the documents one might find in the most private, personal drawers or safe deposit boxes. During their first day of research, students unearthed Mr. Deetken's formal papers documenting his becoming a citizen of United States in 1872. An archivist found records of his son's induction into the army in 1918 and his son's untimely death at age 28 just 3 years later.

Extensive business records outlined a merchant who cared meticulously about his clients and their interests. Detailed records of Deadwood citizens' purchases filled pharmacy books and painted a picture of life in that rugged community. All this was procured in just a day's efforts.

Whose lives might have crossed Mr. Deetken's? Noted Deadwood photographer John C. H. Grabill's photographic lens intersected the front of Deetken's drugstore on at least one occasion that can be documented. Following an innovative series of electronic twists and turns, students ultimately discovered a digitized collection of Grabill's photographs preserved in the Library of Congress. Employing sophisticated research techniques, students were exposed to our nation's depository of historic images, data, and history.

It is unfathomable that some of Deadwood's most celebrated residents, "Wild Bill" Hickok and Calamity Jane, didn't go to the drug store! There is some evidence that pertains to a possible Deetken relationship with Hickok included in the bag in the form of a newspaper article dating back nearly 80 years. The signatures of noted city religious figures, including the prominent George Ayres, appear on numerous documents in this bag, perhaps because Deetken's son Albert was an active Mason, adding to the degrees of encounter with different strands of the community. Julius Deetken was a founding member and first secretary of the original Society of Black Hills Pioneers and a member of the group that formed the First National Bank.

Noted historic figure Reverend Henry Weston Smith regularly preached in front of the Bent and Deetken drugstore. As secretary of the Society of Black Hills Pioneers,

Deetken is given credit for the erection of the monument to Preacher Smith that still stands at the spot where Smith was killed just off the highway north of the city.

One of the eeriest discoveries occurred when students uncovered multiple drugstore envelopes containing hair from members of the Deetken family. Students were shocked by the amount of hair kept in this collection and its condition and especially by the fact that the hair hadn't turned gray in 150 years! The affectionate language on the small crinkled envelopes and tiny ribbons on each lock underscored the love and care that seems to have been abundant in this family.

Student Accomplishments

All in all, some 150 documents were retrieved from the bag, archived, preserved, digitized, and uploaded to a Web site sponsored by the South Dakota Genealogical Web Project (SDGEN). Deadwood's city archivist, Mike Runge, granted permission to put items on display at the newly renovated Fremont and Elkhorn Railroad Depot, now a major tourist attraction. Runge forwarded photos and measurements of the display case so that student teams could create aesthetically pleasing displays. A rare copy of *History of the Dakota Territory* by George W. Kingsbury was obtained via an electronic used bookstore and accompanied the bag when it is put on display in Deadwood. That same electronic used bookstore yielded a book entitled *Deadwood Doctor* written by Dr. Frank S. Howe, who practiced medicine in Deadwood. Bought on a whim because of its title, and unbeknown at the time of purchase, the book prominently mentioned Julius

Deetken's name in the first paragraph, adding to the serendipitous nature of this project.

In one of the early outreach efforts, an Internet search engine was consulted, yielding a list of individuals with the same surname of Deetken presently living across the United States. Individuals were contacted to see if any genealogical information could be obtained. Because of a single phone message left by a student on the machine of one of the subjects revealed on the Internet search, students were able to meet a living relative of the Deetken family, a self-described family historian who visited our school. She brought with her family photographs, including one of Mr. Deetken himself.

A 96-year-old man by the name of Reinhard Deetken living in Holly, Michigan, turned out to be our subject's living nephew. Students were amazed at the opportunity to interact with him; the entire encounter left them spellbound with the tantalizing connection made to Julius Deetken. As it turned out, just after the first conversation, an archivist found a letter dated 1925 written from one of his aunts to another that mentioned Reinhard Deetken by name and did so with a very nice compliment. Students scanned this letter, made a copy, and sent it to him, including a copy of a photo of his aunt that was included in the original letter. A student researcher confirmed his receipt of this letter with a memorable conversation with Mr. Deetken.

Students obtained documents related to a 2000 family reunion that occurred in Mosbach, Germany, attended by 66 members of the Deetken family along with a detailed family timeline and copies of a family tree. Students added missing data stemming from their discoveries,

including a handwritten family tree dating to the mid 1700s. They also were able to assess significant omissions from the biography, including an unknown and previously undocumented marriage, which produced two other children, making the family bigger than anyone had realized.

Discovered during student investigations, *Deadwood Magazine* was contacted and the editor, Rena Webb, was taken enough to publish a cover story in the May/June 2004 issue featuring this project. This publication, taken together with the self-published book, helped spur local media coverage on radio station KCBS and television station KGO, as well as a local residential news publication and the *San Francisco Chronicle*.

Quite fortuitously, students learned that HBO was planning on releasing a new series entitled, of all things, *Deadwood*. The producer of this new series, David Milch, was contacted via his agent and detailed biographical materials were forwarded to Milch's production company in the hope that an authentic character portrayal could somehow be incorporated in a small way.

The Deadwood public library's online collection was reviewed whereupon it was learned that dozens of articles from local newspapers mention Julius Deetken, and his name appears in frequent newspaper advertisements, as well. Copies of relevant articles were forwarded to California and made their way into the self-published book, which was finished a week before the end of the school year.

In May, the South Dakota State Historical Society added a link to their home page featuring the project. The State Archives became involved following a phone call notifying Governor Mike Rounds of the exis-

tence of the bag. Graciously, a representative from the governor's office phoned a leading archivist with the state who made direct contact via telephone. Governor Rounds later sent a congratulatory letter to students.

One of Senator Tom Daschle's regional offices in Rapid City was contacted in order to follow-up a mailed parcel that notified the senator about our discoveries. Given the delay from mail screening that now has to occur, our parcel had not arrived, so a representative kindly sent an e-mail to the Washington office informing them of our story. An aide to Senator Daschle then contacted us the same day inquiring about our efforts. The senator, too, sent a congratulatory letter.

Conclusion

Certainly, this project demonstrates that given an enduring interest, ample technological resources, a good research plan, guidance, encouragement, partnership, and raw primary materials necessary for meaningful historical investigation, very young researchers can make original, authentic contributions to the field of history. For the first time, pioneer druggist Julius Deetken's life story may be told in full detail by marrying digitized images and photographs to an analysis of documents that have not seen light in 130 years. Students started to respond positively to this project right from the start. There was nothing more satisfying than walking into class and having students rush in eager to get to work, asking the question, "Are we doing research today, Mr. Rapaport?"

The enrichment cluster approach created highly challenging learning opportunities that allowed high-

potential students to identify themselves, as well as those who may be overlooked by traditional identification procedures. When any student showed high interest, expertise, and creativity, reinforcing follow-up experiences were provided that supported advanced, highly specialized work that made each student's contribution essential to the project as a whole (Renzulli, 2000).

The Importance of Authentic Learning

The term "authentic learning" is bandied about in the literature. For the purposes of this project, four criteria embedded in real-world problems were assumed to be present in what was termed an authentic learning situation: (1) a personal frame of reference for the individual learner was achieved, (2) the student explorations did not have existing solutions, (3) learners wanted to change prevailing beliefs or inform the target audience, and (4) the target audience was a real audience for whom, in this case, solutions to the real-world problem had powerful implications (Renzulli, 2000).

It was critical that the students in these five classes become "firsthand inquirers." I attempted to create enduring structures within each learner's repertoire that would have the greatest amount of transfer for future use, resulting in a learning experience that created its own relevancy and meaningfulness (Renzulli, 2000). Students received highly reinforcing responses to their work from various segments of society, and they ended up working that much harder because they enjoyed the fact that they were having a real impact. The list of their accomplishments is impressive. Situations were developed

in which students did exactly what practicing professionals do as a regular part of their jobs. Historians write about history, archive data, and reach out to other experts, which is exactly what the students did. They transcribed, translated, scanned, photographed, and delicately preserved this collection. They reached out to myriad contacts ranging from family members, to the entertainment community, to the United States Senate. They documented and otherwise defined each artifact. In doing so, they activated their own interests, skills, and task commitment to self-selected problems and areas of study (Renzulli, 1998).

The value of the enrichment model to instructional settings like mine is that it provides very young students with advanced knowledge and information about a particular field of study while adding important principles of logic and methods of social inquiry to their learning repertoires. Highly specialized knowledge became the focus of these learners, all 150 of them. They needed such knowledge to interact successfully with family members, historians, educators, librarians, and city officials. Their daily criterion performance would exceed the likely job experiences of advanced history students in college and graduate school. They went far beyond theorizing or role-playing by applying research skills from the first day of instruction to the last.

In learning essential prerequisite component skills, students of varying abilities were able to succeed as members of a research team that transcended the boundaries of prescriptive instruction. Of note, this project was performed within five regular education classes, not as a drop-in activity conducted by a

resource teacher or specialist. There was equity of opportunity for each student to contribute to the discoveries being made within each class.

It is hoped that, by preserving this collection, layers of the history of the Black Hills and Julius Deetken's contributions to it may be uncovered and explored more deeply. It is also hoped that teachers may view this project as a model lesson on which to design and develop meaningful, authentic learning experiences for their own students.

There are many clear advantages to basing a lesson on primary research. First and foremost, there is a real-world consequence to the work being conducted in the class aside from the skills that each student is expected to learn following a sequence of instruction. The impact of this project on others has been staggering. Allowing young learners the opportunity to build relationships with adult professionals has been an extremely important and successful part of this project. In addition, student interest never waned in this project because student-directed inquiry prevailed. New twists and turns drove the project into unforeseen directions, with exciting discoveries happening virtually every day. Students began to expect success, uncommon as that is in research.

Another important reason to foster authentic learning experiences such as the Deetken Project is that schools should be a place where students participate in relevant, intelligent activities. "Learning how to analyze, criticize, and select from alternative sources of information and courses of action, how to think effectively about unpredictable personal and interpersonal problems . . . and how to confront, clarify, and act upon

problems and situations in constructive and creative ways" are outcomes worth teaching (Renzulli, 2000).

We have become fascinated with the hardworking men and women who came to Deadwood in the 1800s to form a small community. They built a rough-and-tumble town as they became the foundation of the entire area's success. But, go beneath the surface of Deadwood, to the story of one of its original members, and read a little bit more about Julius Deetken. Go visit our Web site (<http://sdgenie.org/deetken>) and see the thoughts and feelings of his family in letters written by his sister or son and sent to his widow. It will become obvious why the occasion of his death was deeply regretted by the entire Deadwood community.

Epilogue

Some questions have lingered: How did this end up in my hands? Why would someone give up those mementos? In short, what was the chain of ownership that led to someone selling it to me at the Santa Cruz flea market in 1978? We have some answers to that.

We proved that Mrs. Deetken maintained ownership of the bag when we traced her to Berkeley, California, where she moved shortly after her husband died in 1915. News got out of my visit to Deadwood, and, when the bag was dropped off for display at the Deadwood Visitor Center in May 2004, to my astonishment, the son of the man who carved the Deetken gravestones introduced himself. He provided a last known address of the man who paid for Martha Deetken's gravestone, she being the last immediate family member. He showed me the original cemetery record identifying Mr. Deetken's former son-in law, Kirby

Casebolt, as paying for his ex-wife's grave marker. Incredibly, the Deetken surname on her gravestone is misspelled, adding yet another twist to the story of their strained relations. Ironically, Casebolt's last address in Saratoga, California, puts him just over the hill from Santa Cruz, adding to the possibility that he somehow was connected to the bag's journey there. Perhaps that part of the story can be unearthed someday. For now, the entire collection is being made available to other researchers and the general public through a student-designed Web site at <http://sdgenie.org/deetken>.

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In this resource for parents of gifted children, leading experts discuss how to recognize and nurture talent in preschool- and elementary-school-aged children. An introductory chapter provides a framework for understanding the major contributing factors to the development of talent, including the home, the school, outside programs, and the personality of the individual child. The next seven chapters each deal with a major area of talent: music, the visual arts, drama, language arts, science, mathematics, and athletics. In each chapter, the authors identify early behaviors indicative of potential talent and discuss how parents can create a home environment that both elicits and develops their child's special abilities through activities, games, and play. These experts advise when parents should consider more formal instruction in a talent area or supplement school programs with enrichment and home study and criteria to use in order to select good programs. Several chapters address other related issues, including how to work with school personnel effectively to develop an educational program that is appropriate for a child talented in science, mathematics, or the language arts. A final chapter addresses some of the psychological issues relating to gifted children, including four guiding principles to promote their healthy development. These include, for example, promoting the development of social intelligence. Each chapter presents practice and scholarly research in a practical way to help parents with their gifted children.

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Advocacy

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tive work. Many gifted students are working to match the time given to them, rather than etching time needed to do "good work." This is not to say that meeting time requirements is not necessary. However, it is important to acknowledge the need to be able to negotiate time so that productive, original, satisfying work can be accomplished by gifted students. When queried as to why his work did not meet his potential, a gifted student responded with this question: "Do you mean I can lose my potential if there isn't enough time to use it?"

"Time" is an academic terrorist when the teacher adjusts a lesson to meet the daily schedule, rather than allowing the lesson to absorb as much time as is needed. Recent observations in elementary and middle school classrooms have shown a pattern wherein teachers omit elements of a lesson such as motivation and feedback in the interest of time and "meeting the bell." In many situations, the lessons ends abruptly with directions stated by the teacher to try to do the assignment and a promise that the class will review the understandings and skills in the lesson on the next day. This pattern provides insufficient time to discuss and reinforce learning and results in gaps in knowledge and partial mastery of skills. Comments by teachers questioning "the true nature" of a student's giftedness might be more a consequence of time given to lessons by teachers than the current identification of students as gifted.

The elusive and difficult nature of combating the global war on terrorism is quite evident. Fighting some of the features such as "time" that represent the war on academic terrorism seems less elusive and far easier to win. ©CT

Exploring Tableau Vivant

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Appendix A
End-of-the-Year Public Relations Activity Evaluation Form

Name of activity: _____

Date of activity: _____

1. What were the objectives of the activity in which you participated and were they met?

2. What did the gifted education teacher do to facilitate the completion of the activity?

3. What were your impressions of gifted education prior to participation in this activity?

4. How did this activity change your opinions of gifted education?

5. What could the gifted education program do to improve your opinions of gifted education?

6. What suggestions do you have for another collaborative project to complete with the gifted education program?

7. What will you do to help support the school's gifted education program next year?