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Project Work as an Introduction to Research Writing

■ **Traditional approaches that prepare students for research writing often focus on the mastery of skills such as paraphrasing, citing sources, and creating outlines. While these skills are important, they are often practiced at the expense of involving students in a meaningful examination of content. Project work is offered as an alternative approach that is uniquely suited to the different needs of English as a second language (ESL) students. It allows for a cross-curricular approach in which students can demonstrate what they have learned through art, drama, and music without being encumbered by their still-developing reading and writing skills. A 10-week project on plant life, conducted with 12 ESL students at Northeast Middle School in Kansas City, Missouri, is given as an example of how project work can prepare ESL students with the skills needed to begin research writing.**

Journal entry: March 1999. Chico[1] stands on a chair in front of the class. With his arms stretched out to display the elaborate costume of a bird, which he made himself, he says, "I am a bird. I am hungry for some food. I live in the redwood forest."

Journal entry: June 1999. Chico stands in front of the six-foot mural he and his classmates have created. A scene from the redwood forest is depicted. Labels inform the visiting teachers and students of the various kinds of plant and animal life. The sizes and ages of the trees are labeled.

The journal entries above framed the first and final activities of a 10-week investigation into plant life conducted by Ms. Seitz, her assistant, Ms. Arras, and me. The setting was Northeast Middle School in Kansas City, Missouri, where 12 ESL students enrolled in the New Americans' class were learning to read and write for the first time in their lives. Using an arts-based and cross-curricular approach to teaching research

writing known as project work (Chard, 1992; Helm, Beneke, & Steinheimer, 1998; Katz & Chard, 1989), the students progressed from the simple exploration of their topics as demonstrated in their play in April to the more sophisticated understanding of plant life demonstrated in their murals. Drawn from the literature of early childhood education, project work offered a valuable instructional framework appropriate for introducing research writing and guiding the New Americans through their first research projects.

Background

The New Americans' class began three years ago when the district recognized that every year, a growing number of currently enrolled ESL students, which then numbered 1400, had not had the opportunity to learn to read and write in their first language. They needed, therefore, beginning literacy instruction in English, their second language. The existing content-based ESL program was not equipped to instruct students in beginning reading and writing skills in English as it was more focused on enhancing mainstream content instruction. Hence began the New Americans' class.

Presently, the New Americans receive ESL instruction from Ms. Seitz in all subject areas, except physical education and music, for five hours a day. The 12 students are evenly divided between boys and girls and represent the seven countries of China, Croatia, Guatemala, Mexico, Somalia, Sudan, and Yugoslavia. The class curriculum is drawn from state and district objectives and then adapted to address the needs and levels of the students, who remain in the New Americans' program for one year before entering the content-based ESL program.

My role in the New Americans' class was both as an instructional facilitator and a researcher. To better understand literacy development among the New Americans, I spent an average of two days a week during the school year videotaping instruction, interviewing Ms. Seitz, and collecting samples of the students' work. In exchange for her time and access to her classroom, I agreed to work as a team teacher with Ms. Seitz and Mrs. Arras for 10 weeks at the end of the school year. While both of them had completed a variety of projects with their students that year, this project represented the first time they had completed a project following Chard's (1992) model.[2] Ms. Seitz, Mrs. Arras, and I planned, conducted, and assessed a project concerning plant life in Kansas City with the New Americans. The purpose of our project was to instruct the students in the basic skills of research writing. We began by discussing the current thinking in research writing and forming our own position.

The question of how to teach research writing to ESL students has received some attention in the literature. Most recently, Rosser (1995) has criticized the common approach, or "research process" as he calls it, for its over-reliance on the instruction of research skills at the expense of involving the student in a meaningful examination of content. The research process that Rosser (1995) describes is common in any number of advanced writing texts and research handbooks (Arnaudet & Barret, 1984; Johnson, 1987). The

process guides students through a litany of skills such as creating note cards, compiling reference lists, and writing topic sentences with the idea that, once mastered, these skills will enable the students to assemble an acceptable paper.

Rosser's (1995) thesis was not that the instruction of research skills is unnecessary, but that it should occupy a different place in research writing instruction. Using his own class as an example, Rosser (1995) argued that the instruction of research skills should be conducted in a context that focuses first on fully involving the students in the content they have chosen to study. Then, research skills such as paraphrasing, creating reference lists, and writing topic sentences can emerge as students develop a need to express what they have learned in journals, discussions, and various reading and writing assignments.

Ms. Seitz, Mrs. Arras, and I agreed with Rosser's conclusions about how research writing should be taught, but we faced different circumstances that would change how we planned our instruction. Unlike Rosser, who taught advanced adult ESL students, we taught middle-school students who had only begun to learn to read and write that year. Therefore, we could not actually ask the students to write a research paper as that was too advanced. Instead, we decided to lay the groundwork for research writing by allowing them to begin an in-depth investigation into a topic of their choice and then express their findings as a project. From this process, they would involve themselves fully in the research of one subject while learning the skills that form the foundations of research writing.

In the end, the project that Ms. Seitz, Mrs. Arras, and I developed involved the students in three group investigations of plant growth, plant care, and plants as part of the larger ecosystem. Each group worked for two months in the investigation phase of their chosen topics. For two to three hours each week they gathered information specific to their investigations. As sources for this information, they used the school library, classroom instruction, visiting experts, the Internet, and a fieldtrip. Meanwhile, classroom instruction proceeded in the background on the complementary topics of careers in plants, classifying and naming plants, and caring for plants.

The following is a description of how our 10-week project on plants was planned, conducted, and assessed.

Methods

According to Katz and Chard (1989), the roots of project-based instruction can be traced to the turn of the century when Dewey and Kilpatrick first advocated this technique as preferable to the transmission-based instructional models of the day. The focus both then and today has been on guiding young children through the process of conducting an in-depth investigation of a particular topic that is of interest to them. Depending upon the nature of the topic, the interests of the students, and the goals of the teacher, projects may span a school year or be completed in just two or three weeks. The teacher's role is to facilitate and guide the independent and self-directed work required

of the students, document their progress, assess their work, and find ways in which the projects can complement the existing curriculum.

Planning for Project-Based Instruction

Our planning began with the selection of a content area in which to conduct project work. We chose science and narrowed the specific topic to plant life around Kansas City. While the reasons that led to this decision were partially based on the unique challenges Ms. Seitz's students faced combined with the science objectives of the school district, they are equally valid for other ESL teachers contemplating project work. First, the area of science instruction in general provided natural opportunities for students to participate in hands-on instruction that had been a part of the class since the beginning of the school year. In addition, we hoped to find ways in which the students could conduct academic work despite their still emerging reading and writing skills. The student-centered nature of project work addressed these issues. Given the right circumstances, the students could learn by observation and communicate what they had learned through art, drama, demonstration, or speaking.

To develop and focus our planning for the projects, we followed Chard's (1992) suggestions and created a cluster map of several project ideas that would complement the existing curriculum on plant life. Our objective was not to violate the spirit of project work by deciding upon project topics for the students, but to anticipate project ideas, to identify community and instructional resources, to search for ways in which project work cut across other curricular areas, and to link the projects to the larger unit on plant life that would be simultaneously taught to the whole class. The best project ideas could be supported by community and school resources, would have strong links to the central topic, would link to other curricular areas, and would have the potential to inform the students and inspire self-directed study. In all, we developed ideas for approximately 10 different projects.

To plan the classroom instruction, Ms. Seitz, Mrs. Arras, and I considered our objectives for learning in the content area of plant science first and then deduced which reading and writing skills followed naturally. This gave us two lists of interconnected objectives that functioned as one. Next, we planned how and in what format the objectives would be met, using classroom instruction or small-group work. Originally, we planned that content objectives would be met during classroom instruction, but we found that students benefited from supplementing classroom work with small-group work. Content objectives taught during class were reviewed in small groups and then acted as springboards for developing project ideas. Specific instruction in reading and writing was done in small groups, where students could receive the undivided attention of the instructor

The physical organization of the room was changed to accommodate the steadily growing number of texts, films, stories, and pictures that we collected in preparation for the projects. Since we had already decided that the students

would work in three groups with one teacher supervising each group, we created a center for each group in a different corner of the room and equipped each with paper, pens, pencils, tape, dictionaries, and crayons. As the students defined their projects, each center gradually filled with the resources that they or the group's supervising teacher had collected. Throughout the room, storybooks concerning plant life were placed on display for all of the groups. *Plants that Never Ever Bloom* (Heller, 1984), *From Seed to Plant* (Gibbons, 1991), and *How do Apples Grow?* (Maestro, 1992) were among the favorites. Students were encouraged to use their spare time relaxing on the couch, reading to each other, and learning informally about plant life.

Phase One

After completing the planning, we were ready to start the first phase of project work. According to Chard (1992), this should begin with assessing the students' current knowledge of the subject, encouraging them to raise questions, and challenging any misconceptions. Chard recommends holding a discussion with the students in conjunction with a thought provoking activity, experience, or video to encourage discussion.

Ms. Seitz, Mrs. Arras, and I decided to conduct an experiment with the class. In our experiment, we gave each student four beans with instructions for them to wrap two in a wet paper towel and to plant the other two in a Styrofoam cup full of soil. They were instructed how to care for the beans in the soil and in the paper towels. In the days to follow, they would compare and make predictions about the differing growth patterns of the beans in the cups and those in the paper towels. Over the next three days, the bean assignment was complemented by a number of experiment-related assignments that cut across math, art, and language arts. The first was a class discussion in which we recounted the steps students had taken to prepare their bean experiments. The paragraph we wrote as a class that day at the board is below.

> Today we did an experiment. Last night we soaked the beans. Today, we filled some cups with dirt and put two beans in the dirt. They were two inches deep. Then, we put two beans in a paper towel. We put water in the cup and on the paper towel. Which one will grow first?

After the students copied the paragraph from the board, we asked them to predict which beans would grow the first, the fastest, and the tallest. The questions generated a spirited debate as the students argued their various positions. In a follow-up assignment, the students drew pictures underneath their paragraphs representing their predictions. This became the first page in a journal of lab reports. Each page of their journals included a description of the experiment, their predictions, and the outcomes.

We then extended the experiment to other curricular areas. Measurement was the topic in math, so math lessons included discussions of the sizes of trees and plants. For instance, we compared the heights of the burr oak trees

of Missouri to the heights of the students. They drew pictures of themselves standing next to the different trees and labeled the heights in feet and inches. In Language Arts, the students listened to a reading of the book *Apple Picking Time* (Shawson, 1994) and used the story as a prompt to create their own play about an adventure in the forest. To integrate movement into the learning process, a specialist in interpretive dance visited the class and led the students through a number of movements that represented the growth of a seed into a plant. We conducted a similar experiment each week over the next month, each time finding ways to extend the lesson focus through the curriculum.

Phase Two

According to Chard (1992), in phase two the teacher should provide opportunities for the students to develop an understanding of the selected subject. Two highly recommended activities are taking a fieldtrip and speaking with experts from the community. Following these activities, the students determine the questions for their projects and then begin research. For our students, this phase was the core of their experience. It led them from a general understanding of plant science to a very specific project investigation. These activities accounted for the majority of the time spent on the project, a total of two months working approximately two days a week.

With so much to accomplish, beginning phase two initiated a number of questions. The broadest question concerned how these students could conduct sustained and in-depth investigations while many were still developing their reading and writing skills. The skills the project required were extensive. In the following weeks, we would ask the students to identify a question, locate the sources that would answer the question, systematically record all of the information, and present this information in an organized and cogent manner. We broke our task into three parts: (a) to create a non-threatening environment for learning, (b) to teach the students to organize and record data, and (c) to develop the students' research skills.

First, since the students would accomplish much of their learning in small groups using oral language skills, we searched for a way to maximize the amount and quality of student participation in a comfortable and non-threatening environment. We chose to use instructional conversation. On the surface, instructional conversation resembles a conversation among friends. However, in the classroom setting this conversation is more carefully orchestrated. The teacher creates a challenging but non-threatening atmosphere. The conversation includes responses to student contributions, the promotion of discussions that may include many solutions, a focus on building a stream of connected ideas, and an open floor allowing people to participate without being nominated (Tharp & Gallimore, 1991).

However, there is also an instructional component. The teacher directs the discussion by weaving a theme throughout the conversation, activates the background knowledge of the students, provides direct instruction when necessary, encourages the students to use more complex language, and asks stu-

dents to explain the basis for their contributions. The purpose of the instructional conversation is to move students to an increasingly sophisticated understanding of the topic while maintaining an informal and non-threatening environment. The instructional conversation has been documented as a valuable technique with children who have a range of needs including special education students (Echevarria & McDonough, 1993), Hawaiian children (Tharp & Gallimore, 1991), and ESL students (Goldenberg, 1991).

An example of an instructional conversation took place following our fieldtrip to the local nursery, where we met with a community expert on plants. The transcript below is a segment from approximately 100 hours of videotaping collected throughout the year for the larger study as well as for the assessment of the projects. In the lesson below, I review some of the experiments and activities we completed with my small group. My purpose is to brainstorm a variety of possible topics for the group's project. The exchange is part of a 90-minute lesson in which the students generated approximately 60 questions.

S: What about the growing?
T: Yes. We've studied a lot about how plants grow. Each of you is growing a plant too.
S: Yes. What about the seeds…the roots?
T: What about how the seeds grew in the paper and in the soil?
S: Yes. What about the seeds grew in the paper?
T: How can we make a question now?
The students began formulating a grammatically correct question. On a large sheet of paper, I followed their prompts and wrote, "Why did the seeds grow in wet paper towels and in the soil?"

This transcript reveals three elements of the instructional conversation consistently present in the small group exchanges during the second phase. The first element is background knowledge, evident in the first comment when the students are reminded of the past lessons on plant life and their continuing project of growing their own plants: "Yes, we've studied a lot about how plants grow. Each of you is growing a plant too." Second, student contributions are acknowledged. This is illustrated in the next line when the student's contribution is restated. Finally, throughout this exchange and the others, the environment is challenging but non-threatening. The student contributions are discussed and treated as valued pieces of learning.

As this was the first time for our students to conduct research, our second task was to teach them how to organize and record the data that they would collect throughout their research. The KWL chart proved to be a simple but effective tool. Ogle (1986) explained that the KWL chart includes three sections. The first section documents what the students *know* about the subject (K). The second section details questions from the day's fieldtrip, what they *want* to know (W). A third section is filled in as the students find answers to their questions, indicating what they have *learned* (L).

In each small group session, Ms. Seitz, Mrs. Arras, and I modeled the process of organizing and recording student findings by using the KWL chart. In the appropriate sections we wrote down what they already knew about the day's topic, the questions they raised throughout the lesson, and the answers they found. Eventually, each group chose a central question to guide their research, and it was written across the top of each chart. The groups reduced their central questions to several smaller tasks under the section titled, "What would you like to know?" For example, Ms. Seitz's group investigated how to care for a rose bush that a student named May had purchased during the field trip. Their central question was, "How can we take care of May's rose bush?" Some of the smaller tasks they listed were to call the nursery and ask more questions, to visit the community library, to look for books, and to interview the community expert who spoke to the class. Each student was responsible for a particular task, and the student received a due date to ensure that the work progressed. They recorded the answers to their questions in the third section of the chart.

The final task was to develop research skills. We realized that these could be taught directly through worksheets and texts, but this was not our plan. We wanted the skills to emerge from their questions about their particular investigation. An early and recurring skill the students wanted to master was how to discriminate between information that related to the topic and that which did not. We facilitated this learning by presenting several readings at the beginning of each lesson and asking the students to anticipate what a reading might be about by examining the titles, pictures, and headings. Readings that they thought would not answer their central question in some way were discarded. Readings that did answer the central question then became the focus of the day's lesson.

A second student skill that needed to be developed was to locate the main idea and then to summarize the findings. Finding the main ideas was best taught by playing a game that we invented called "just three words." In this game, we asked the students to describe a paragraph from the reading in just three words or less. From there, we asked them to use the same three words, or fewer if possible, in a sentence that expressed what they had learned about the paragraph. This formed the basis of summarizing. They recounted their reading at the end of the small group sessions, and we wrote their summaries on a large piece of paper. Finally, they learned the concept of documenting their sources by listing the author and title of their sources next to their findings on the KWL chart.

After eight weeks of investigation, the benefits derived from their hard work were apparent. The KWL charts hung on the walls, the centers filled with the numerous informational texts the students had collected, the notes from the interviews, drawings, stories, and a variety of written assignments. The students had utilized the introductory research writing skills discussed by Rosser (1995) to conduct the research for their projects, and, like Rosser's class, these skills had emerged from their own needs and taken form in a variety of interactive classroom activities such as journals, games, and discus-

sions. Table 1 lists the activities and the associated research writing skills introduced to the students.

Table 1
Activities and Associated Research Writing Skills

Activities	Research Writing Skills
Journal writing and language experience	Writing paragraphs and topic sentences
Predicting the topic of a reading	Discriminating between information which relates to the topic and that which does not
Using the KWL chart	Using note cards to document findings, compile a reference list, and generate new questions
Main idea game	Finding the main idea and paraphrasing

For the first time in their lives, the students had learned how to find information in the library, how to organize the information, and how to sustain a long-term research project. Their final task was to decide how they would organize and display what they had learned for the other students.

Phase Three

In the final phase, we discussed and examined similar projects that the students had accomplished earlier in the year and encouraged them to select the one they thought best expressed what they had learned. While the examples included plays, songs, and artwork, all three groups chose to create a mural displaying their work. My group created a drawing of a scene in the redwoods and labeled the heights, types, and ages of the different trees in the redwood forest. Animals that lived in the forest were included and placed in their habitat. The mural, which was six feet long, was supplemented by a short information sheet about the redwood forest and by an audiotape that the students created explaining the details of plant and animal life. While their topic was a departure from the original plan of examining plant life in Kansas City, we decided that the group's enthusiasm justified the change. Their question was, "What are the most surprising facts about the redwood forest?"

Mrs. Arras' group extended their study of seeds introduced in the first experiment. They created a drawing illustrating the early stages that a plant passes through in its transformation from a seed to a plant. They accompanied the drawing with an explanation that answered many questions they had

formulated during the investigation. Specifically, they wanted to learn how the seeds placed in wet paper towels sprouted roots without soil. Also, they identified the different needs of roots and leaves and how those needs changed throughout the lifecycle of the plant.

Ms. Seitz's group completed a list of suggestions for how to care for May's rose bush. They included tips on watering, on choosing appropriate soil types, on selecting the best pest control, on pruning the bush, and on determining the necessary amount of light needed for the plant to flourish. Drawings comparing the color, size, and care requirements of May's rose bush with other kinds of rose bushes decorated their six-foot-long mural, making it a very colorful project. With Ms. Seitz's help, they made a handout summarizing what they had learned and passed it out to interested visitors.

Assessing the Projects

Our final task was to assess the projects. Unlike systematic instruction in which the teacher looks for evidence of measurable behaviors such as how the children are acquiring skills or how fast they are learning, the teacher conducting project work tries to determine how the students are applying the skills, how deep their understanding is, and how resourceful the students are in solving problems. This assessment was not easy considering the diverse and open-ended nature of the work the students had completed; however we found that Chard's (1992) assessment rubric, which can be used throughout to assess small group work, was helpful.

Chard (1992) divides her rubric into five broad categories which include (a) the initial idea, (b) planning, (c) doing and recording, (d) discussion, and (e) the final product. The categories reflect the phases students pass through as they develop their projects and allow the teacher to check a group's progress by answering a set of associated questions under each category. Since the object of the assessment is to gain understanding of the processes the students employ to complete their projects, assessment should take place while the students are working.

In order to collect an accurate sample that we could analyze carefully and repeatedly, we videotaped the groups throughout the projects. During classroom instruction, the video camera was placed in the back of the classroom. The wide-angle lens and high-quality microphone produced a view of the whole class and clear audio. For small group work, we simply moved the video camera from group to group when one of us wanted to record a particular lesson.

Since I had been videotaping the class throughout the year, the students were accustomed to working in front of a video camera. For teachers who do not regularly use video cameras in their classroom or plan to use it for the first time as part of a project, I recommend introducing the camera gradually. We started at the beginning of the year by teaching the students how to use the camera and allowing them to videotape their friends during class. This relieved the anxiety they had about being videotaped and reduced the tempta-

tion to show off or misbehave for the camera. Also, we placed the camera in the back of the room, which was not used regularly by the students, so that it would not be in view during instruction. In a short time, the video camera became just another fixture in the classroom.

We used the video camera with my group to record the example presented below. It was selected because it cut across the third category of doing and recording and the fourth category of discussion, a feature we found common among the groups. This example occurred just a few days after my group had decided to study the redwoods. A student had just learned about one of the largest and oldest trees in the forest named General Sherman.

S1: What to do today?
S2: How about…study General Sherman?
S1: What's that?
S3: Hey, let's write the question on the chart.

The students decided to investigate the question and wrote it on their KWL chart.

The questions associated with doing and recording include:

1. How does the work progress?
2. What questions are raised?
3. What research is done in books or through consultation?
4. How are research findings incorporated into the work?
5. How is the progress of the work being recorded?
6. How is the child applying basic academic skills in this work?

From this exchange, we learned that the students were drawing on what they had learned from texts to form new questions. We were, thus, able to answer questions one, two, and three of our assessment. Later, we found the answer to question number four when the students included a drawing of the General Sherman tree in their mural. We omitted question five because the students used a KWL chart to record all of their data. Question six emerged in other exchanges when the students worked on finding the main idea, summarizing, or yet another skill.

Under the category of discussion, the questions included:

1. What is the purpose of the discussion?
2. How focused is it?
3. What decisions are made on the basis of the discussion?
4. How are the results of discussion recorded and/or implemented?

Of these four questions, this exchange addressed the third and the first most directly. Concerning the first question, we found that the students set the purpose of the exchange. Concerning the third question, we learned that students made decisions based upon discussion with very little intervention from the instructor. In this particular exchange, the students happened to agree upon what they would study. Student-driven discussions were the norm, a feature we attributed to our use of the instructional conversation.

Concerning the remaining questions, because we had standardized how

data should be recorded, we dismissed number four, "How are the results of discussion recorded and/or implemented?" We found that by examining longer exchanges, we could best answer question two, "How focused is it?" Other exchanges during phase two were assessed using the criteria under "Initial Idea" and "Planning," depending upon the focus of the lesson. During phase three, exchanges that occurred while creating the mural were evaluated using the criteria under "Final Product."

Conclusion

Other ESL teachers considering project work for the first time would benefit from requesting the assistance of parents or community volunteers to facilitate small group work. With one adult for each group, we were able to help the students advance their work very quickly. We also found that videotaping oral interaction throughout the project was very valuable. While time-consuming and requiring some careful forethought, the tapes provided an ongoing stream of data to aid in assessment and planning. Finally, we recommend beginning with a short-term project of two or three weeks instead of one that spans two or three months. This simplifies planning, requires fewer resources, yet will still provide a strong instructional experience.

When the projects drew to a close, we were pleased with all that the students had accomplished. In contrast to traditional approaches to teaching research writing, our purpose was to focus the students' involvement on their chosen topics of study, on the content, with the expectation that the necessary research skills would emerge in response to the tasks they faced. Their learning was largely accomplished through oral language but was revealed in a number of ways including artwork, demonstration, writing, and drama. After just 10 weeks of work, the students readily mastered their selected content and the associated research writing skills.

> Journal entry: June 1999.
> It is the end of the day, and all of the students have gone home. The assignments have been graded and returned to the students. The murals are taken down and stored for posterity. The projects are completed, and there is a feeling of satisfaction among the teachers. We sit quietly looking through our papers. A single KWL chart hangs on the wall, but it is not complete. I think back, "They always had so many questions."

Author

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Endnotes

[1] All students' names are pseudonyms.

[2] Informal discussions with other ESL teachers in the content-based program revealed that they had not conducted a project following Chard's (1992) model either.

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