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ABSTRACT
                The GALAXY Language Arts Demonstration Program is a
package of integrated curricular and instructional approaches that
features the organization of instruction around themes presented
through television broadcasts, children's literature, classroom
activities, and the use of interactive technology. During the GALAXY
Project demonstration phase for language arts in grades 3 through 5,
classrooms in 37 schools were connected by an interactive satellite
communications network. Seven successive themes were used, including
such issues as fairness, personal privacy, and first impressions.
Television broadcasts dramatized the GALAXY themes through a
continuing show about the lives of a multicultural group of students.
Specifically, GALAXY classrooms utilized a core of six literature
books for each of the seven themes, a take-home magazine ("The Second
Story"), a periodic response bulletin ("The Max"), a teacher's guide
with suggestions on reading and writing strategies, and a wide choice
of classroom activities for before, between, and after the two
broadcasts for each theme. Measures of student learning were
administered in all GALAXY classrooms and in two kinds of comparison
classrooms, classrooms which were not using the program in GALAXY
schools and others in demographically similar schools where GALAXY
was not being implemented. Additionally repeated observations and
interviews were carried out in five case study schools throughout the
United States. Testing 2,826 students in GALAXY and comparison
classrooms showed that GALAXY students outperformed others in reading
and vocabulary growth, but GALAXY students did not outperform the
others in writing achievement. Eleven appendixes provide technical
information about the study, sample performance assessments, scoring
guides, and results from a teacher survey. (Contains 8 figures, 37
tables, and 19 additional tables in the appendixes.) (SLD)

Galaxy Classroom Project Evaluation

Language Arts, Grades 3-5

Final Report

December 1993

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Summary of Findings

The GALAXY Language Arts Demonstration Program is a package of integrated curricular and instructional approaches. It features the organization of instruction around themes presented through television broadcasts, children's literature, classroom activities, and the use of interactive technology.

During the GALAXY Classroom Project demonstration phase for language arts in grades three through five, classrooms in 37 schools were connected by an interactive satellite communications network. The demonstration took place during fourteen weeks in the spring of 1993. Each classroom was equipped with a fax machine, audioconferencing telephone (the "hoot 'n holler"), video cassette recorder (VCR), and television (TV), which were linked by Very Small Aperture Terminals (VSATs) to enable two-way voice and data communication and one-way television communication.

The Far West Laboratory for Educational Research and Development carried out a multifaceted evaluation of the operation and impact of the program for this initial demonstration phase. The evaluation encompassed testing of student learning through both standardized measures and performance-based instruments, surveys of teacher and student attitudes and teacher practices, and teacher records of utilization of the GALAXY curriculum.

Measures of student learning in reading and writing were administered in all GALAXY classrooms and in two kinds of comparison classrooms, classrooms which were not using the program in GALAXY schools and others in demographically similar schools where GALAXY was not being implemented. In addition, repeated observations and interviews were carried out in five case study schools throughout the country, with shorter visits to several other schools.

Thematic Curriculum

The intellectual core of the GALAXY curriculum was the organization of all instruction around seven successive themes, each of them designed to be of genuine interest to GALAXY students. They included issues such as fairness, personal privacy, and first impressions. The success of this thematic structure was essential to the success of GALAXY, both for motivational reasons and for providing a coherent, integrated structure for the diverse GALAXY activities.

Broadcasts. Literature, and Faxes

The television broadcasts dramatized the GALAXY themes through a continuing show about the lives of a multicultural group of students, interacting together in an after-school community center. The story line was engaging and featured characters with whom students could identify. The open-ended themes in the programs were intended to stimulate critical thinking and discussion, unlike the traditional use of "instructional" television. Within the broadcasts, the characters modeled children communicating purposively through reading and writing.

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GALAXY recommended children's literature to complement the themes and to engage the multicultural audience of learners; these books contrast significantly with traditional "basal" readers. The GALAXY books dealt with engaging subjects and characters with whom it is easy for GALAXY students to identify. Listening to the reading of good books provided a common basis for the sharing of perceptions and personal meaning.

One of GALAXY's unique advantages is the ability to engage students in interaction through its dedicated satellite network, classroom fax machines, and "hoot 'n holler" audioconferencing network. The fax, in particular, is integral to the motivational incentives of GALAXY's approach to language learning.

Reading Outcomes

GALAXY students significantly outperformed comparable students in reading achievement, as measured by standardized test scores for two components of reading assessment. These results are based on testing 2,826 students in 93 GALAXY and 53 comparison classrooms in January and May 1993, using the Vocabulary and Reading Comprehension subtests of the California Achievement Test, Fifth Edition (CAT/5).

- These gains are similar for grades 3, 4, and 5, regardless of gender, ethnicity, Chapter 1 eligibility, home language, and special education status.

- Gains are similar regardless of how well students initially performed on these measures.

Vocabulary Results

The results from the Vocabulary subtest showed a statistically significant greater gain for GALAXY than for comparison students.

- GALAXY students had an average gain of 13.8 scale score points, while comparison students gained an average of 10.05 — a 37% greater gain for GALAXY students. GALAXY students performed above the expectation suggested by national norms by more than 30%.

- When GALAXY and comparison classrooms are matched by rank from highest to lowest in terms of Vocabulary gain, GALAXY classrooms display consistently higher gains on Vocabulary scores.

Reading Comprehension Results

The Reading Comprehension subtest showed a statistically significant greater gain for GALAXY students than for comparison students.

- GALAXY students had an average gain of 7.67 scale score points, whereas comparison students had an average gain of 3.13 points — GALAXY students made 145% greater gains than comparison students in Reading Comprehension.

- When GALAXY and comparison classrooms are matched by rank from highest to lowest in terms of Reading Comprehension gain, GALAXY classrooms display higher gains at almost every point.

Factors associated with greater gain

Other factors related to the intensity with which GALAXY was taught were associated with greater gains in test scores.

- Students in the ten classrooms whose teachers used GALAXY as a replacement for their traditional language arts curriculum scored two-thirds better on the Vocabulary subtest (mean Vocabulary gain of 21.1) than students in the seventy-nine classrooms where GALAXY was a supplement (mean Vocabulary gain of 12.5). Both groups scored better than comparison students.

- Average gains in classrooms where the fax machine was used two or three times per week (as recommended by GALAXY) were more than twice as high as for occasional use classrooms on Reading Comprehension (11.0 versus 4.0 scale score points) and almost 75% higher on Vocabulary (16.1 versus 9.3 scale score points).

Writing Outcomes

Writing is another important part of the Language Arts curriculum. GALAXY provided a unique context to stimulate student writing through faxing to real audiences and writing about themes that clearly engaged student interest.

The evaluation measured one type of writing, persuasive writing, which required students to take a position on an issue and support it with evidence, a kind of writing that was closely allied with the GALAXY curriculum. Writing prompts, given to both GALAXY and comparison students, were used to elicit a pre/post measure of this writing ability, and they were supplemented with curriculum embedded writing performance tasks, given to GALAXY students only.

- Both GALAXY and comparison students made statistically significant gains on the pre/post writing prompts, but there was no significant difference in performance between the two groups.

- GALAXY students showed statistically significant gains on the first three embedded performance assessments, but there was no significant gain when all four performance tasks were viewed together. However, performance assessment four was administered very close to the end of the school year, and student scores may well have reflected various distractions in the school environment.

It is probable that GALAXY writing achievement will be enhanced as teachers learn to include more "process writing," the process of review and revision that is designed to develop writing skills, when they use the GALAXY curriculum.

GALAXY reached its diverse multicultural learners in a way that generated extraordinary student enthusiasm. That enthusiasm was shared by teachers, who in numerous cases reported that the experience had brought new life to their professional work. GALAXY has had an impact beyond language arts; it has changed the way many teachers view the capabilities of their students. GALAXY's unique interactive component, the use of the fax machine, fueled that enthusiasm, despite some technical problems.

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I. Introduction

Excitement, high expectations, lots of discussion, and plenty of writing comprised part of the GALAXY experience for the students who were in GALAXY Classrooms in the Spring of 1993. The GALAXY Classroom Project was developed as a nationwide reform effort to infuse new curricula into schools, to spark the interest of teachers and students, and to make a significant difference in the educational lives of students who traditionally have been labeled "at-risk."

During the fourteen-week GALAXY Classroom Project demonstration phase for language arts in grades three through five, classrooms in 37 schools were connected by an interactive satellite communications network. Each classroom was equipped with a fax machine, telephone, video cassette recorder (VCR), and television (TV), which were linked by Very Small Aperture Terminals (VSATs) to enable two-way voice and data communication and one-way television communication.

GALAXY is more than the sum of its technology. GALAXY is a set of integrated curricular and instructional approaches. GALAXY Language Arts features the organization of instruction around themes, presented through television broadcasts, children's literature, classroom activities, and the use of technology. GALAXY classrooms utilized a core of six literature books for each of the seven themes, a take-home magazine (*THE SECOND STORY*), a periodic response bulletin (*THE MAX*), a teacher's guide with suggestions on reading and writing strategies, and a wide choice of classroom activities for before, between, and after the two broadcasts for each theme.

This document describes the findings from an evaluation of this demonstration phase of the language arts cycle for grades three through five (the first curricular area on which GALAXY focused). This evaluation report documents some of the changes, large and small, that took place in GALAXY Classrooms throughout the country.

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II. Evaluation Design

The GALAXY Classroom Project has a strategy for empowering learners: providing themes that have meaning for students, engaging students in real reading and writing tasks, and providing opportunities for the students to participate in problem solving, reflection, and reasoning in a language arts curriculum that employs innovative technologies. This curriculum, which reflects a shift in the goals and practices of education and a major change in teacher practice, requires a similar shift in evaluation methodology and practice. Researchers at Far West Laboratory for Educational Research and Development (FWL) developed a multi-method evaluation that gathered both quantitative and qualitative data to assess student outcomes, changes in teacher attitudes, and the implementation of the curriculum and its integral technology components.

Quantitative Data

Three quantitative measures of varying generalizability and purpose were used to assess students' progress in areas related to the GALAXY curriculum. These were norm-referenced tests, which provide a skills-oriented achievement measure; "persuasive" writing prompts, which showcased students' ability to choose a position and support it with evidence; and two pairs of curriculum-embedded performance assessments, which were designed to mirror closely the GALAXY curriculum.

In addition, other measures gave evaluators a window on what participants were thinking and doing. Student perceptions of themselves as learners were measured both before and after their participation in the GALAXY classroom. Teachers' attitudes towards constructivist teaching were similarly measured. The "intensity of use" of the GALAXY curriculum was measured through bi-weekly teacher activity logs. An end of year survey gave teachers the opportunity to rate the various components of GALAXY and to comment on how GALAXY had affected them and their students; about two-thirds of the GALAXY teachers returned the survey.

Qualitative Data

FWL researchers collected qualitative data by conducting a series of site visits to selected GALAXY sites. During the visits, researchers observed students and teachers engaged in GALAXY instruction and technology use, conducted structured interviews with teachers and principals, interviewed GALAXY students in small groups and informally, and analyzed student work in their GALAXY portfolios.

Five schools were selected as case study sites and visited by FWL researchers for two to three days on three separate occasions during the fourteen-week cycle. In addition, a sixth school was visited twice and two others hosted a researcher on single occasions. These schools were selected for their geographic and ethnic diversity. Two of the

schools had significant bilingual populations, and all but one of the schools were eligible for Chapter 1 funds. In addition, schools were selected so that the sample would include both rural and urban sites.

Comparison Groups

The GALAXY evaluation employed two different comparison groups. The first group consisted of typically one third, fourth, or fifth grade classroom that was not participating in GALAXY in a school that had GALAXY classrooms. This comparison group allowed comparisons that held constant all school-level factors. The second comparison group encompassed classrooms that were not in GALAXY schools but were in the same district as GALAXY schools. This group enlarged the sample of comparison classrooms. The non-GALAXY schools were picked by the superintendent of the district in response to a request from FWL to select schools that were very similar to the GALAXY schools in the district.

Sampling and other data selection

Funding constraints dictated that not all measures could be scored for all students, so evaluators developed a random sampling plan that was designed to include students from every classroom. All students who took the CAT/5 pre-test were initially included in the evaluation; those that had only the pre-test or the post-test were dropped from subsequent analyses. From among all students who had taken the CAT/5 pre-test, approximately 87% of the writing prompts in each classroom were scored, and scores for those students with both pre-test and the post-test writing prompts were analyzed. For the performance assessments, which were designed to be paired, we included only classrooms that had administered the first and fourth and/or the second and third performance tests. The relevant sample sizes appear in the chapters on Reading and Writing.

In addition, we omitted from the analysis those few sixth grade classrooms that participated, since the GALAXY curriculum was designed for grades 3 through 5; the two year-round schools since their schedules dictated that the FWL testing dates would be inappropriate; and schools that were not Chapter 1 participants.

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III. Thematic Curriculum

The GALAXY thematic curriculum is a big hit with both teachers and students. In this chapter, evidence from both teachers and students will be provided to support this finding.

Conceptual Framework

A conceptual framework underlies the GALAXY Classroom language arts curriculum. Its tenets are the following: (a) background knowledge plays a critical role in reading, writing, and learning; (b) curricula must address the linguistic, cognitive, sociocultural, and developmental dimensions of literacy; (c) children of diverse ethnic, linguistic, and economic backgrounds must have equal access to experiences and knowledge at our nation's schools; (d) cultural diversity is a strength (rather than a deficit) that children bring to school; and (e) the role of curriculum is to affirm, build upon, and extend the experiences of the students.

Seven themes that have their foundation in this framework are part of the language arts curriculum. These themes are diverse, but all deal with social and interpersonal issues that affect all people. The seven themes are: (1) People Are More Than They Appear to Be, (2) Establishing Your Own Space, (3) Who Is a Hero?, (4) Be True to Yourself, (5) It's Not Fair, (6) People Need People, and (7) People Working Together Can Make a Difference.

Teacher Reflections on the GALAXY Themes

Responses to the end of year teacher survey reflect teachers' positive opinion of the GALAXY themes. Eighty-four percent of the teachers responded "very well" in answer to the question of how well GALAXY helps students to relate the GALAXY themes to their own experience. Similarly, teachers thought that GALAXY did a good job in assisting students to develop an in-depth understanding of the themes (58% said GALAXY did this "very well").

Table 1 Teacher Rating of Student Reaction to GALAXY Themes (Percent)

Since GALAXY began, my students	Very Well	Somewhat Well	Not Very Well	Not At All
Relate the GALAXY themes to their own experience	84.2	14.9	1.0	0.0
Develop an in-depth understanding of the seven themes	58.4	38.6	3.0	0.0

Ninety-two percent of the teachers thought that the GALAXY themes had great educational value (only the broadcasts rated higher), and they were almost as sure that their students liked the themes (89% said their students liked the themes a lot).

Table 2. Teacher Rating of the GALAXY Themes

Educational Value

	Number	Percent
Great Value	96	92.3
Some Value	8	7.7
Little Value	0	0.0
Did Not Use	0	0.0

How Much Students Liked

	Number	Percent
Liked a Lot	91	89.2
Liked Somewhat	10	9.8
Did Not Like	1	1.0
Did Not Use	0	0.0

Teachers at the case study sites unanimously gave the seven GALAXY themes high marks. They were extremely impressed with the relevance of the themes to their students' lives, regardless of grade level. "Powerful," "motivating," and "relevant" were the terms they used repeatedly to describe these themes. Teachers frequently mentioned the themes when reflecting upon their GALAXY experience, as the following comments indicate:

Teachers value the themes

"Great Program! Our school has adopted the 7 themes schoolwide. We will do one them per six weeks, with the last 2 being combined."

"I love the themes—very developmentally appropriate!"

"The well thought out themes along with the corresponding literature have been fantastic!"

"It has given me more of a structure. The themes were excellent & appropriate for 'today's' students. It enlightened me to great literature books."

"It is generally very good! ... [GALAXY] gets teachers thinking in terms of themes, concepts & ideas, instead of isolated skills. GALAXY is really tops!!!"

"I've really gotten into the themes—I really like them! Other themes have struck me as dumb or sappy. These were just right."

Students love the themes

"All of my students loved GALAXY!! At the end of the year I asked my students if they could remember the GALAXY themes—they know every one of them."

"The children love the thematic approach. It has improved their ability to focus on a problem."

Themes helped students to share and to think

"My students related very well to the GALAXY classroom objectives because of the social structure of each theme. They were quite verbal and ready to share their experiences."

"Helped sensitize children to real issues. Lent sophisticated thought processes."

"Through ideas and discussions from the GALAXY curriculum, my students shared many feeling, problems and opinions that perhaps could not have been shared without suggestions that came out in each theme."

"This program gets a Rave Review from me. I loved the themes you chose and the wonderful books selected to accompany them. But, watching my students loving to read and write more was extremely rewarding. I know my students showed a new height in being creative because the program greatly motivated them. They were kinder to their peers and I felt that I was a more effective teacher."

"The best part of GALAXY is the thematic approach. Literature selections are great—activities well done. Video component is the hook for students and pulls together theme."

"I am more interested in developing themes for a whole language approach. While I have taught Literature based classes the last two years, GALAXY allowed a more whole language approach."

"GALAXY has strengthened my teaching strategies. It has fit well into my 'style' & given me a positive tool to foster a more positive interaction with my students & they with each other. It has allowed us to fit most everyday situations, other literature, true life (both past & present; fact & fantasy) into one of the themes, and has given a common, non-threatening way to deal with most situations. I love it and want to continue using GALAXY. Will it be up-dated & continued later on? Hope so. We're hooked! Thanks a million times. I'm sorry I didn't use the fax more, but the rest was used a lot & very much appreciated."

Student comments on the GALAXY themes

Students at the case study sites appeared not only to understand the themes but also to value highly the learning that came from exploring them. Their high regard for the themes is demonstrated in the answers they provided to FWL researchers when asked to imagine all the GALAXY activities in which they participated and then to think of the most important thing they learned while doing these activities. Their important GALAXY lessons included:

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"Katie was in a wheel chair and nobody teased her." (People Are More Than They Appear to Be)

"What I learned when joey and Carl read Jannelle's diary and invaded her privacy was how you need to forgive your friends. Listen to yourself, and don't be hard on others because they did something bad to you. Give friends another chance." (Establishing Your Own Space)

"I learned about ordinary people and how they are as important as superheroes. Ordinary people can be heroes too." (Who Is a Hero?)

"When you lie to yourself you hurt yourself, no one else. You get in more trouble when you lie. When you tell the truth, you don't get in as much trouble. It's an important value." (Be True to Yourself)

"Don't keep things bottled up inside. Carl's father drank and he didn't tell nobody." (It's Not Fair)

"If you don't have people in your life, then you can't learn or be alive. People write and read books and make cool GALAXY stuff, that's why we need people." (People Need People)

"I used to think people can live without other people. This [GALAXY] proved to me that people need one another and that I need a lot of friends." (People need people)

"People need other people. You can't build a house all by yourself." (People Need People)

"All the time you have a problem, you should tell them and ask for advice. I don't like to tell about my problems, and tell people to 'bug off.' But then I don't have help. If you tell people, then you get lots of suggestions. All the characters at THE HOUSE had problems and we helped solve some of them." (People Need People)

"I learned from THE HOUSE that sometimes I was similar to Carl and I haven't faced all my problems yet like Carl—so I learn a lot about myself." (From many themes)

"I learned from the shows that other kids have problems—once everyone forgot my birthday—and you can learn about things you don't know and can relate to the kids. I learned to respect others." (From many themes.)

Students at the case study sites were also able to demonstrate their understanding and appreciation for the themes when they were asked to select a favorite GALAXY book and to explain the reason for their selection. Many of their reasons indicate that they were able to make a connection between the themes and the literature.

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Students were extremely interested in all of the themes. Two themes were especially popular—"People are more than they appear to be" and "It's not fair." While many students were reluctant to leave the "fairness" theme, many teachers jokingly expressed relief when they could move on to another one. Other themes dealt with values, such as "Be true to yourself," and some teachers were uncomfortable with them. Additionally, discussion and writing related to the themes occasionally led to students' painful self-disclosure. Not all of these students' teachers felt comfortable or adequately prepared to deal with such situations.

Request for longer theme cycle

The only criticism heard about the themes was related to the theme cycle. Teachers repeatedly expressed frustration with the two week theme cycle which made it difficult to fully utilize all aspects of the GALAXY curriculum for each theme.

> *"Time constraints for each theme were too rigid. We loved the accompanying activities, but, felt rushed trying to complete theme. The time schedule was unrealistic—when you're dealing with other scheduling..."*

> *"The themes were wonderful. I very definitely need more time to fully utilize the materials for each theme. Two weeks isn't long enough, with all of the wonderful materials and ideas for each theme, I need approximately four weeks or longer per theme."*

> *"I would like to see more time given to each theme—I feel like I am racing to do activities, read literature, see shows & fax in a two week period."*

Summary

The GALAXY themes appealed to both teachers and students. Not only did students like the themes, but they also clearly understood them. Further, the themes stimulated the students to engage in writing and thinking and to integrate the themes into their conceptual frameworks. However, GALAXY would have an even greater impact if the theme cycle were lengthened to three or four weeks to give teachers and students more time on the suggested activities, to facilitate more process writing, and to create a less-hurried learning environment. In addition, GALAXY should consider including the topic of dealing with student self-disclosure in staff development discussions and material.

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IV. Reading

The Impact of GALAXY on Reading

The GALAXY approach to reading draws from current practice and knowledge about effective instruction in this fundamental proficiency, by having reading become central to each student's continuing exploration of themes relevant to his/her own life. Within a GALAXY classroom, literature provides the focus for discussion, class activities, and writing, all thematically integrated. Reading is designed to be a satisfying and enjoyable activity, rather than merely a classroom exercise.

GALAXY's intended effects are facilitated by enhancing teachers' skills in supporting students in a literature-based learning environment, by increasing student motivation, and by increasing experience with reading for meaning. Each of these factors, to the extent GALAXY is successful, has the potential to produce both short and long term impacts on the growth of reading proficiencies.

This chapter reports on the evidence for the effectiveness of GALAXY in changing reading instruction, in modifying attitudes toward the teaching and learning of reading, and in improving tested reading achievement during its initial fourteen-week implementation.

Teacher Reports on GALAXY's Reading Component

Teachers at several case study sites were interviewed about their classroom practices and about the reactions of students during the course of the project. They also responded at the end of the year to a survey that included open-ended questions on the impact of GALAXY on their teaching and on their students. A number of observations arise from these sources.

The teaching of language arts changed as a result of GALAXY. A number of teachers reported that GALAXY was instrumental in effecting a major change in the way they taught language arts, including their utilization of reading materials. Virtually every classroom saw a change to the use of GALAXY's thematically based literature selections, as opposed to the use of basal readers or thematically disconnected pieces of literature.

There also is much evidence that the thematic structure of the curriculum was successful in integrating the reading component of the curriculum with other learning activities, including writing and those activities centered on responses to the television programs.

The books selected by GALAXY for classrooms were enthusiastically received by both teachers and students. Interviews with teachers through the FWL case studies indicated unalloyed enthusiasm for the reading materials made available as a part of the curriculum — all of which were selected to be quality children's literature closely integrated with the GALAXY themes and activities. On the FWL end of year survey, 91% of teachers gave the GALAXY literature books the highest possible rating, that of "Great Value."

Teacher comments about reading on the end of year survey were enthusiastic, as the following samples indicate:

> "As a teacher the literature component was impressive. I used more literature in my lessons on a regular basis. I also felt motivated to discover other new titles to reflect the message of the themes."

> "I introduced children to literature that I would not ordinarily have read to them."

> "The literature books are by far the best selection of multicultural stories that I have ever read to my classroom."

> "I had wanted to implement a literature-based reading program into my classroom but I felt really tied to the basal."

> "The best part of GALAXY is the thematic approach. Literature selections are great."

> "GALAXY has ... guided me to some outstanding new children's literature."

> "GALAXY has changed the way I teach reading."

Student Reactions to GALAXY's Reading Component

There are four sources of data on the reaction of students. Groups of students were interviewed at the case study sites near the end of the Language Arts series and asked to rate the GALAXY literature; an attitude survey was administered to students; teachers were interviewed at the case study sites throughout the program about the reaction of students; and the end of year survey provided another opportunity for teachers to comment.

End of year interviews with eighty GALAXY students, detailed further in Chapter VIII on GALAXY components, show that 84% reported that they greatly enjoyed reading the books, with only 16% having mixed feelings and none negative. Those who had mixed feelings about the literature primarily noted that they thought some of the books selected by their teachers were "too easy." When asked to indicate their satisfaction with having the GALAXY books read to them—a common practice in almost all classrooms—72% gave a highly favorable rating, while 20% were more cautionary and

8% were unfavorable, primarily on the basis of the style and expression used by the teacher.

A pre- and post-measure assessing an array of relevant student attitudes was administered to the GALAXY and comparison students. One scale, developed for the purpose of the evaluation, was a seven-item scale on attitudes toward reading. While this paper-and-pencil measure did not reveal significant differences between GALAXY and comparison students on an overall reading scale, GALAXY students showed significantly higher change scores on one of the individual items. GALAXY students showed a positive change in "liking to read in their spare time." They also tended to have higher positive change than the comparison students on other individual items, such as viewing themselves as good readers, but not enough higher to reach statistical significance. We must note that the results for individual scale items are somewhat suspect, given chance statistical variations; nevertheless, these results confirm other evidence that student views toward reading and their own competence in reading began to change as a result of GALAXY.

Teachers reported very positive student responses to the GALAXY literature, as illustrated by the following examples:

> "My children were motivated to read independently; even the reluctant reader was taking books home and really reading them."

> "I loved the themes and the wonderful books selected to accompany them."

> "... watching my students loving to read and write more was extremely rewarding."

> "The students love to hear me orally read the new GALAXY books for each theme which motivates them to want to read the books."

> "GALAXY has not only increased my students love for reading, but it has also increased my love for reading."

> "I watched with pride as my children's writing and reading skills improved."

Cognitive Measures of Reading: Student Results on the California Achievement Test

Given the start-up nature of the period under evaluation and its brief duration, expectations for demonstrably higher gains in reading proficiency for GALAXY students were not high. Nevertheless, both FWL and GALAXY's management wanted to assess any such gains quantitatively and carefully. After much consideration, FWL decided to utilize a norm-referenced test to assess growth in reading proficiency. There were several reasons for this decision: such measures remain key indicators for many

school boards; Chapter 1 programs, one of the key target groups for GALAXY, require such performance measures to meet Federal and State requirements; and finally, the refined psychometric characteristics of these tests provide the potential for comparatively sensitive measures.

The Educational Testing Service, on behalf of FWL, undertook a review of available national standardized tests, through its National Test Center in Atlanta, and recommended the California Achievement Tests, Fifth Edition, (CAT/5), published by CTB Macmillan/McGraw-Hill. This test is widely used throughout the country.

FWL chose to use the Vocabulary and Reading Comprehension subtests of CAT/5, which together make up the Reading Total Score. These measures have been developed by CTB in recent years to be more reflective of whole language theory, notably by providing more contextual meaning for items used in the tests.

FWL's rationale was that, if meaning-centered approaches are working well in the classroom, Vocabulary, as well as the ability to comprehend what is being read, would be positively affected, and those enhanced proficiencies would be measurable on commonly used standardized tests as well as on more "authentic" measures. Additionally, FWL employed other, less-structured methods to assess cognitive gains and writing proficiencies, as outlined in the discussion of the evaluation design at the beginning of this report.

The CAT/5 reading subtests were administered to both GALAXY and comparison students by their teachers prior to the initiation of GALAXY, and again in the final weeks of the semester. The CAT/5 uses different tests for each grade level, and FWL used the same form for both the pre-test and the post-test in order to cut down on the variation due to switching forms.

FWL performed two different analyses on the CAT/5 data, the first using all the student data for matched GALAXY and comparison classrooms in the same grade at the same school (55 classrooms in 21 schools with Chapter 1 students) and the second using student data from all GALAXY and comparison classrooms that had the relevant data (146 classrooms in 40 schools with Chapter 1 students). The first analysis is the more powerful of the two since it controlled for both grade and school, which is often a source of variation in terms of school culture, leadership, and student characteristics. The second analysis was more generalizable in that it used a greater mix of classrooms than did the first analysis. This analysis included some third, fourth, and fifth grade classrooms in non-GALAXY schools in school districts that had at least one GALAXY school. These schools were recommended to FWL by school district administrators as being similar to the GALAXY school in terms of demographics and other school characteristics.

FWL analyzed the scale scores from the CAT/5, which are units of a single, equal-interval scale. The same scale is applied across all levels of CAT/5 regardless of grade or time of year when the test is administered. The effective range of scores for each

grade, as one might expect, is slightly different. The obtained scale scores are based on the overall pattern of correct responses, rather than simply on the number of correct responses. Further, FWL used gain scores in analyzing the CAT/5 data because the evaluation focused on change over time ("gain").

Analysis of matched sample

The analysis results in Table 3, based on the analysis of the 55 classroom matched sample of 26 GALAXY and 29 comparison classrooms, show that GALAXY students achieved a significant gain in scale scores over the fourteen week course of GALAXY. These results demonstrate a statistically significant greater gain for GALAXY students in twenty-one different GALAXY schools throughout the country as compared with comparison students in the same grade and same school, in Vocabulary, Reading Comprehension, and overall Reading Total. Indeed, GALAXY students gained almost twice as much in Reading Comprehension (90% greater gain) and nearly fifty percent more in Vocabulary (47% greater gain) during the tested period than did the comparison students in the same schools.[1]

Table 3. Mean CAT/5 Scale Score Gains for GALAXY and Comparison Students at the Same Grade Level in the Same School

		GALAXY Gain	Comparison Gain	Difference in Gain	t	p
Vocabulary	Mean	12.84	8.73	+4.12	2.78	.006
	Standard Error	1.10	1.03	1.48		
Reading Comprehension	Mean	8.11	4.26	+3.84	2.70	.007
	Standard Error	1.06	1.03	1.42		
Reading Total	Mean	11.09	6.68	+4.41	3.73	<.001
	Standard Error	0.88	0.84	1.18		

A more generalizable sample of classrooms

A more comprehensive analysis contrasts all relevant GALAXY classrooms with all available comparison classrooms (both those in GALAXY schools and those in non-GALAXY schools) in 40 schools. Again a statistically significant pattern emerges, as shown in Table 4, even when this larger sample of 2,826 students in 146 classrooms is used: the GALAXY students show a gain on Vocabulary that is 37% greater than that of the comparison students, and their gain on Reading Comprehension is 145% greater than that of the comparison students.

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[1] The means presented are weighted estimated means, designed to adjust for unreliable test scores, as discussed in the Appendix A

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Table 4. Mean CAT/5 Scale Score Gains for GALAXY and Comparison Students in 146 Classrooms

		GALAXY Gain	Comparison Gain	Difference in Gain	t	p
Vocabulary	Mean	13.80	10.05	+3.76	2.34	.006
	Standard Error	1.03	1.24	1.61		
Reading Comprehension	Mean	7.67	3.13	+4.53	2.33	.021
	Standard Error	1.22	1.52	1.95		
Reading Total	Mean	11.62	6.81	+4.81	3.13	.002
	Standard Error	0.97	1.19	1.54		

While slight differences appear in these two analyses, the patterns consistently show that GALAXY students had significantly greater gains than comparison students.

One gauge of the performance of GALAXY students is to estimate the gain that would be expected of students to maintain their relative rank between testing periods (e.g., stay at the fiftieth percentile). An examination of the CTB norms indicates that, in order to hold their own, students have to gain from about 18 to 20 points in scale score from one year to the next. For the one semester of the GALAXY intervention, a gain of 10 points might therefore be expected for a cross section of American children. On the Vocabulary subtest, the data in Table 4 show that GALAXY students overall, with their tested gain of more than 13 points, performed above expectation by more than 30%, whereas the comparison students were right on target, gaining about 10 scale score points.

GALAXY gains compared to national norms

In order to see how GALAXY and comparison students fared with regard to their national counterparts in the norming sample, which included a cross-section of all American students, rich and poor, in public and private schools, we have translated the Scale Score gains into Normal Curve Equivalents (NCEs) and Percentile ranks, for the composite Reading Total score on CAT/5, as shown in Table 5. We combined grades and estimated appropriate NCEs and Percentiles.

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Table 5. Change in Percentile and NCE Ranks of GALAXY and Comparison Classrooms on CAT/5 Reading Total Score

		GALAXY	Comparison
NCE	Pre-Test Rank	45	47
	Post-Test Rank	43	43
	Pre-Post Change	-2	-4
Percentile Rank	Pre-Test Rank	40	44
	Post-Test Rank	36	36

As Table 5 demonstrates, students in both GALAXY and comparison classrooms dropped from pre- to post-test. Unfortunately, the most recent data on disadvantaged, Chapter 1 schools suggests it is a common pattern for such students to fall further behind their peers as they proceed through school. A recently published assessment of Chapter 1 programs by the U.S. Department of Education found a consistent drop, from the third to fourth grade, of three percentile points on both reading and math standardized test scores. The authors of that report note that these results are consistent with an earlier longitudinal study and show "that the gains of Chapter 1 participants did not match the progress of a representative sample of all students generally."[2]

GALAXY students, however, came much closer to holding their own in relation to their peers. Participants in GALAXY dropped only half as much on NCE and percentile measures as did their comparison class counterparts. These data support the conclusion that, in its first iteration, the GALAXY Language Arts curriculum served to ameliorate the reduced rate of growth of cognitive proficiencies that characterizes America's disadvantaged children.

The NCE and percentile data, however, should not be used as more than a rough indicator. The slight drop for GALAXY students is somewhat inconsistent with the earlier demonstration that students in GALAXY classrooms exceeded performance expectations for the tested period. Since the NCE and percentile data are based on combined norming populations for the different grades, and since typically test-retest does not occur in so short a period, the NCE and percentile data may be somewhat misleading if taken in terms of absolutes. Only a longitudinal study of GALAXY students over a more extended period of time than four months would settle the issue definitively.

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[2]*Reinventing Chapter 1: The Current Chapter 1 Program and New Directions.* U.S. Department of Education, 1993.

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Does the effect of GALAXY depend on ethnicity, gender, or other student characteristics?

Because GALAXY is designed to meet the needs of the increasingly multicultural populations of our schools, the evaluation team deemed it important to determine whether it served all those populations successfully during the demonstration phase. Appropriate statistical analyses were carried out to test whether the gains by the GALAXY students depended on grade level, gender, ethnicity, Chapter 1 status, home language other than English, and special education status. All of these analyses showed that the gains did not differ significantly by any of these categories. Statistically speaking, there were no significant main effects for these variables nor were there any interactions with the treatment that were statistically significant.

The demonstrated advantage of GALAXY is not the result of differential impacts among ethnic groups, whether African-American, Hispanic, Asian American, Native American, or other. Neither does GALAXY's advantage rest upon differential impact on girls and boys. GALAXY students had pre-test scores that were related to what grade they were in (e.g., 4th graders had higher initial scores than 3rd graders), but the magnitude of their gains was not related to what grade they were in. That is, GALAXY effects were similar in third, fourth, and fifth grades. A further analysis showed that the gains shown by GALAXY students were not dependent upon status as a Chapter 1 recipient, whether the language spoken at home was English, or Special Education status. It is therefore appropriate, in the rest of this report, to discuss the impact of GALAXY without regard to these special populations.

The range of performance among classrooms

As with all studies of classroom performance, we found great variation among classrooms in both their initial scores and in their gains. Schools differ, children differ in their backgrounds, and perhaps most importantly teachers differ.

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Figure 1. Mean Gain on Vocabulary for 93 GALAXY Classrooms

Vocabulary Gain Score
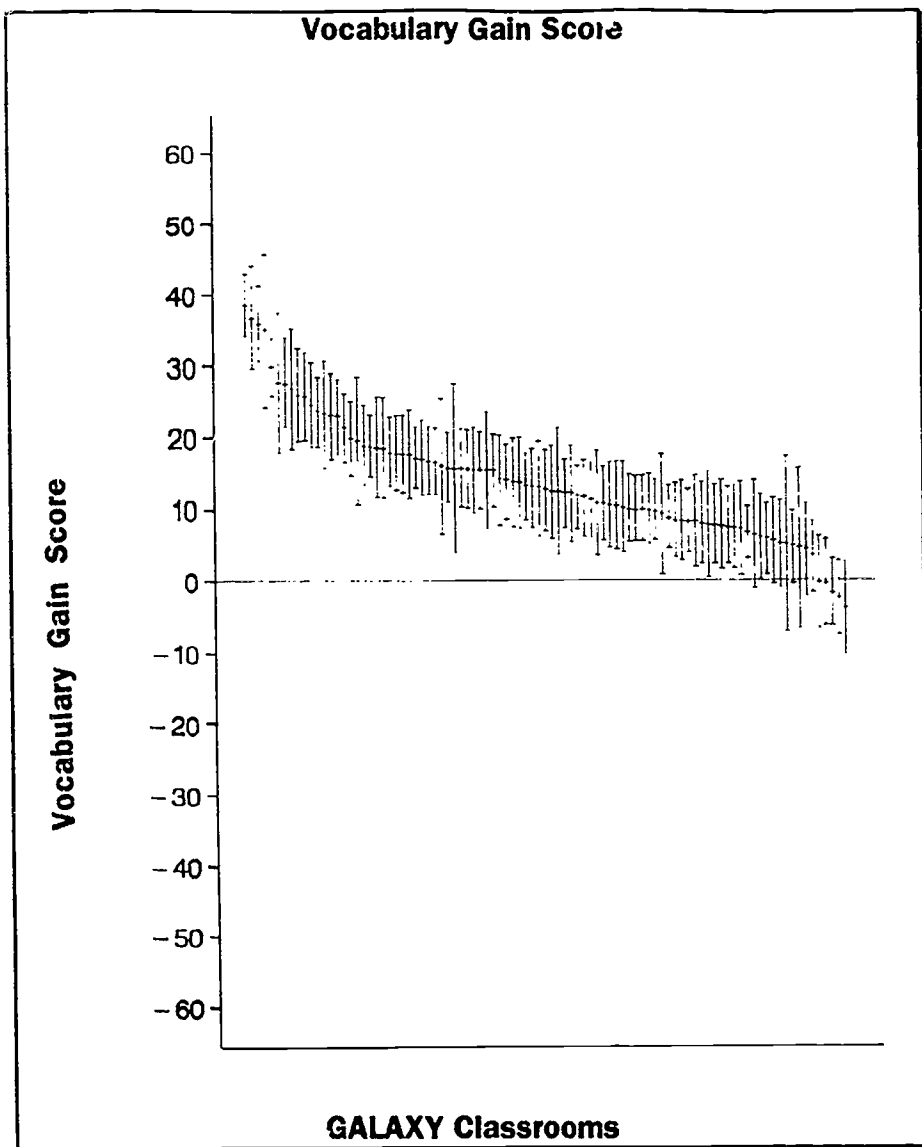
GALAXY classrooms varied widely in their gain scores, as did comparison classrooms. Graphical representations of the rank order of the two groups of classrooms in terms of the Vocabulary subtest are displayed separately in Figures 1 and 2 which show the mean gains and standard errors for GALAXY and comparison classrooms arranged from highest to lowest.

Note from Figure 1 that some GALAXY classrooms had a mean gain of nearly 40 points at the high end, while only five of the ninety-three classrooms (5%) failed to post a Vocabulary gain.

Figure 2. Mean Gain on Vocabulary for 53 Comparison Classrooms

Vocabulary Gain Score

Comparison Classrooms
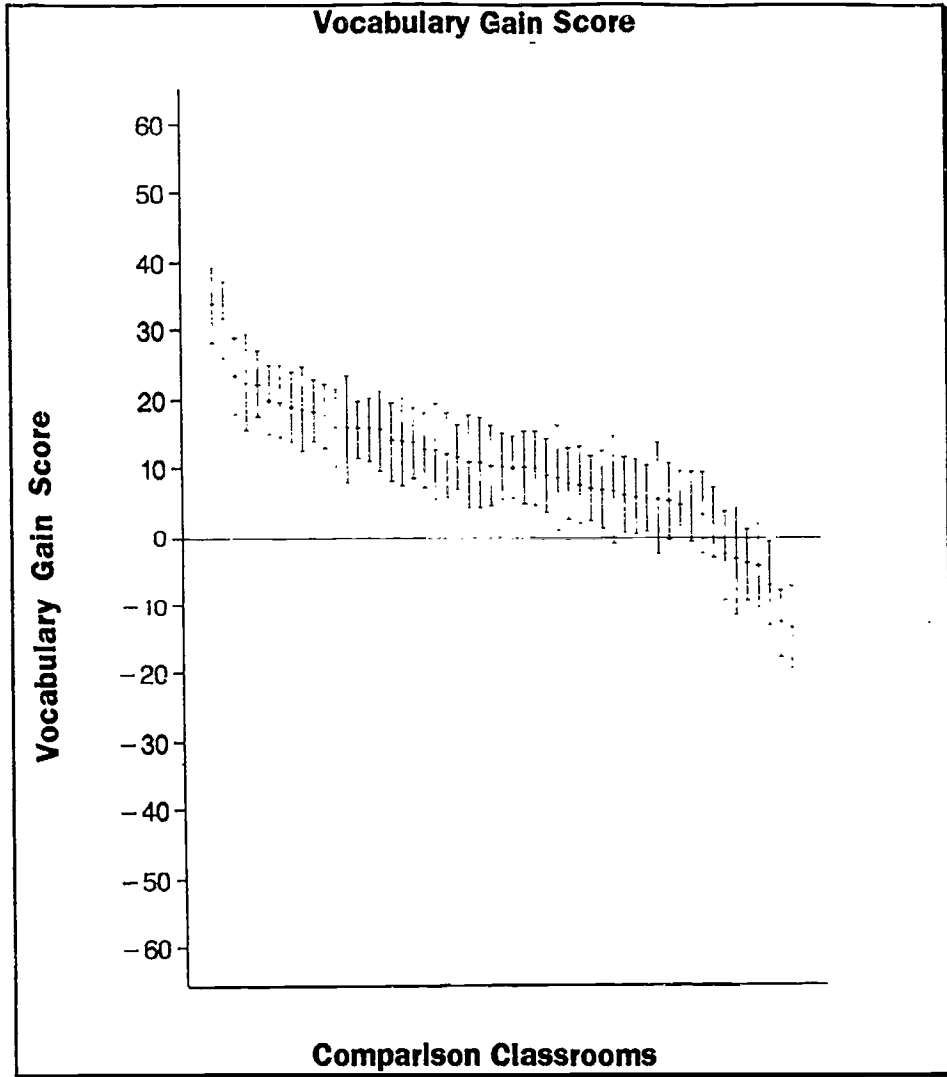
Figure 2 shows that a few exceptional comparison classrooms gained, on average, more than 30 points, but seven of the fifty-three (13%) failed to make a gain. Indeed, the curve that one would get from connecting the means with a line seems to be similarly shaped to that for the GALAXY classrooms.

Figure 3. Mean Vocabulary Gain Score by Classroom

Vocabulary Gain Score

Y-axis (Vocabulary Gain Score): 40, 30, 20, 10, 0, −10, −20, −30, −40

X-axis (Percentile Rank of Classroom): 100, 80, 60, 40, 20, 0

Classroom: ——— Galaxy   ······· Comparision
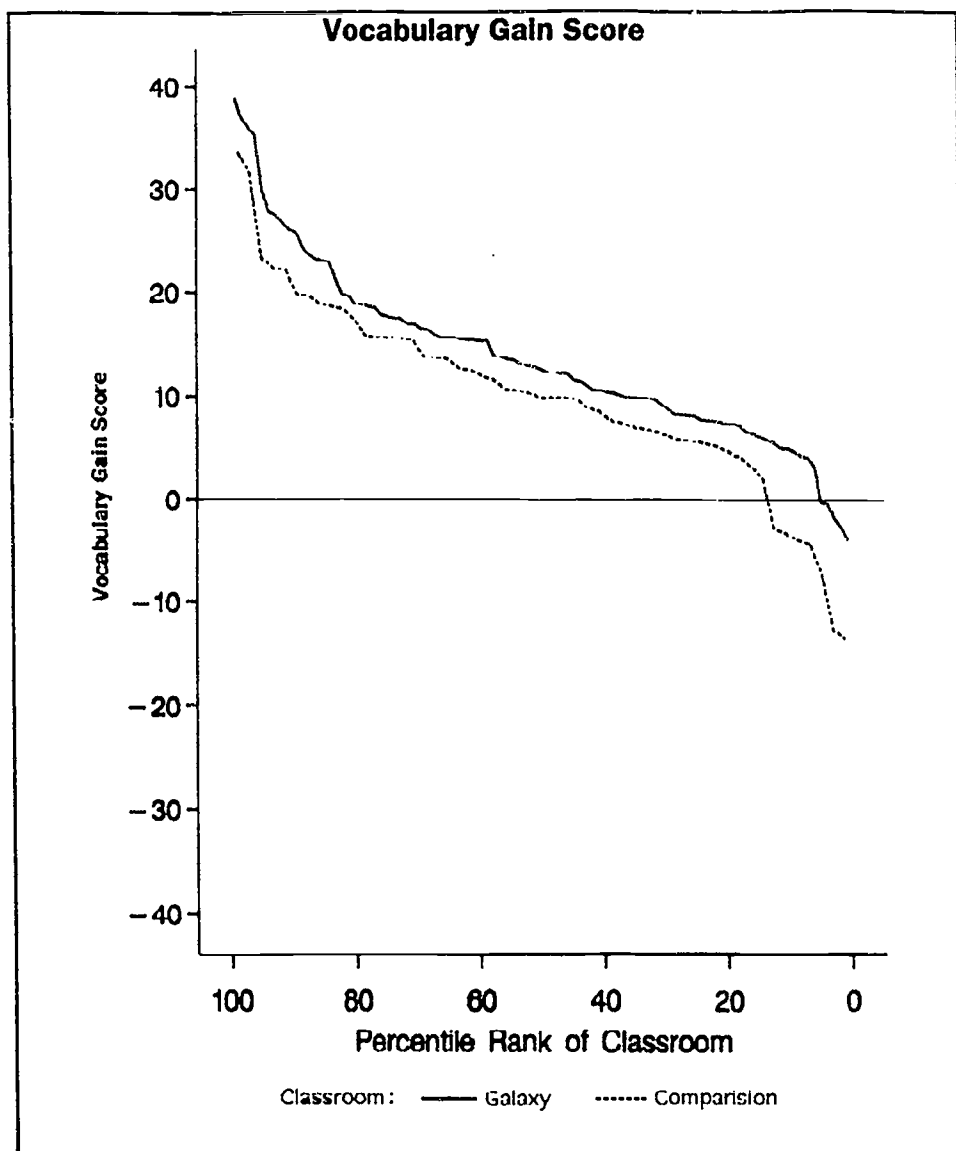
However, when the two curves for the ninety-three GALAXY and fifty-three comparison classrooms are overlaid, as in Figure 3, it becomes apparent that the entire distribution of GALAXY classrooms is shifted toward better performance. That is, GALAXY classroom at the eightieth percentile outperformed comparison classrooms at the same percentile; the same is true at the twentieth percentile. Furthermore, as Figure 3 illustrates, 17% of GALAXY classrooms showed gains in the Vocabulary subtest of twenty points or more, twice as great as the expected 10 point gain. Only 9% of comparison classrooms made similar gains.

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Figure 4. Mean Reading Comprehension Gain Score by Classroom

Reading Comprehension Gain Score
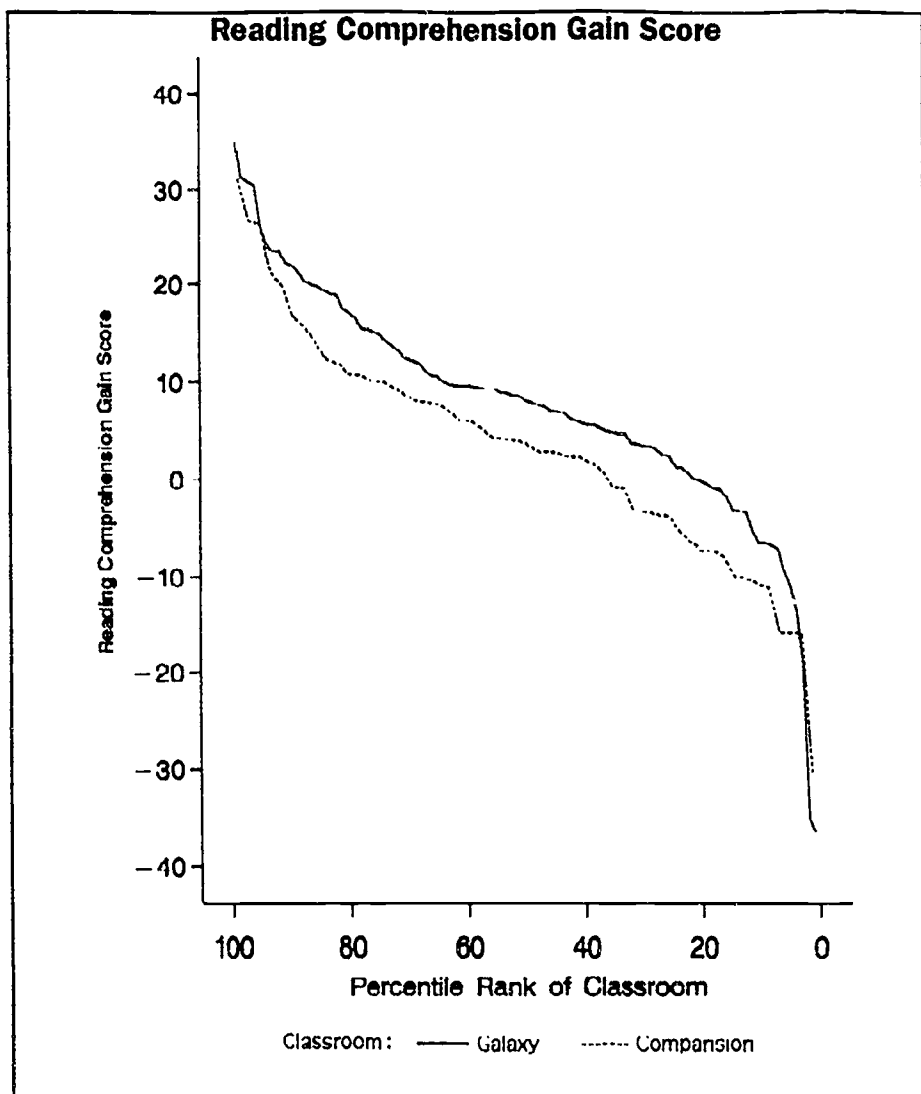
Figure 4 shows the similar but less dramatic results for Reading Comprehension. It indicates that, for the vast majority of students in classrooms in the middle of the distribution, GALAXY classrooms had higher Reading Comprehension gains than comparison classrooms.

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Figure 5. Mean Reading Total Gain Score by Classroom

Reading Total Gain Score
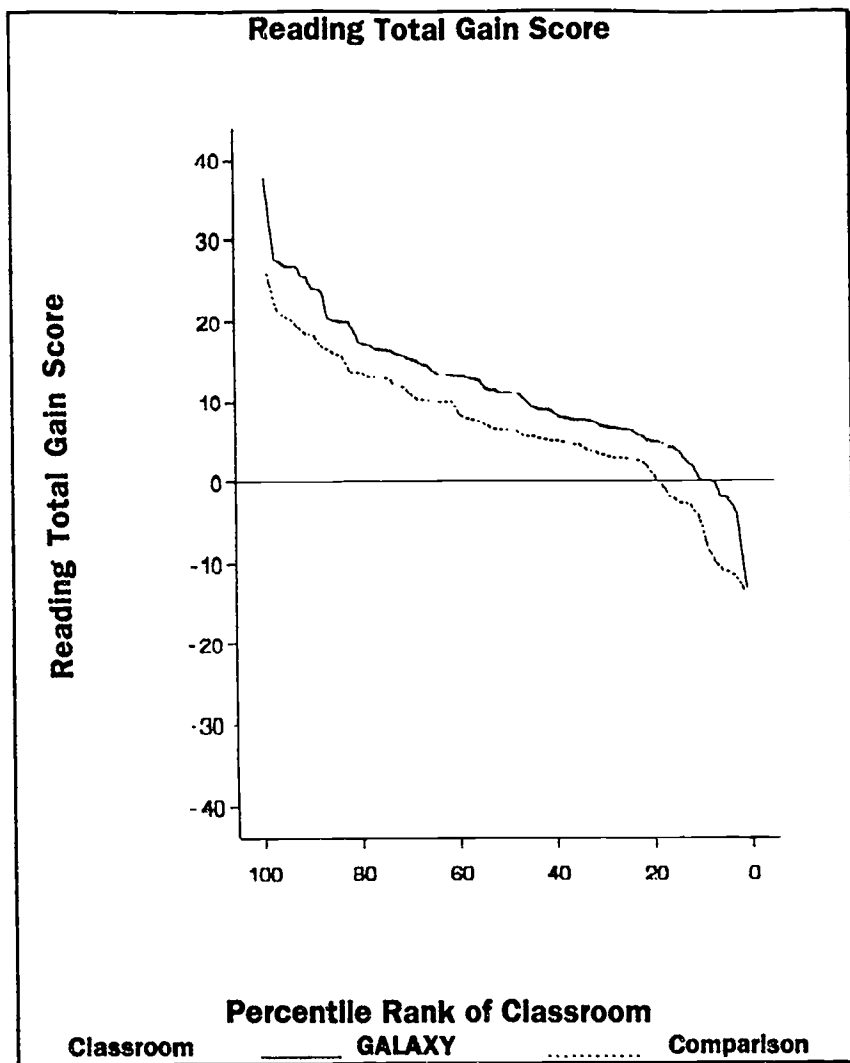
Figure 5 represents the mean overall Reading Totals for GALAXY and comparison classrooms. Since the Reading Total is based on the combined Vocabulary and Reading Comprehension scores, it is not surprising that the evidence indicates that GALAXY students outperformed their counterparts.

An examination of these figures shows that, for classrooms that performed at a variety of levels throughout the range, greater gains are to be found consistently for the GALAXY classrooms.

What characterizes more and less successful GALAXY classrooms?

The CAT/5 test revealed a substantial range of performance in GALAXY classrooms, and this suggests the utility of analyses to identify some of the sources of those differences. To the extent that they reflect factors that can be modified by GALAXY's management, they may represent a potential for increasing the effectiveness of GALAXY in the future.

The evaluation gathered a good deal of information provided by teachers, principals, and students about the characteristics of participating classrooms. The end of year teacher survey (see Appendix K) contained questions addressing such matters as the amount of time spent using the various GALAXY technologies, the amount of time they were fully operational, and the perceived educational value of each of the instructional components. A pre/post survey on instructional practices and beliefs provided further information. Finally, detailed teacher logs of instructional time gave insight into the amount of time spent teaching each of the GALAXY themes and the specific activities that were used.

FWL has analyzed this information base to ascertain whether certain characteristics define either the best-performing classes of GALAXY learners or the poorest performers. The analysis was done for the entire population of GALAXY classrooms on which data was available.[3]

The relationship was analyzed in two ways: through correlations with Vocabulary and Reading Comprehension gain scores and through an analysis of groups of classrooms divided into categories on predictive variables, to determine the effect on average classroom cognitive performance.

As one can see from Table 6, the analysis showed small, but statistically significant, positive correlations of Vocabulary gains with several measures including using GALAXY as a replacement for the traditional language arts, spending time on GALAXY, and using the fax machine. Interestingly, none of the three factors in Table 6 had a significant correlation with gains in Reading Comprehension. As later analyses in this chapter show, however, classrooms at the high end on these variables did have greater Vocabulary gains.

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[3]Teachers were not wholly consistent in providing information on their classroom practices; therefore, the number of teacher responses varies somewhat from question to question.

Table 6. Vocabulary Gain and GALAXY Language Arts Teaching Intensity

Variable	Correlation With Vocabulary Gain (Significance)	Correlation With Reading Comprehension Gain (Significance)
Teacher report: GALAXY used as a replacement rather than as supplement for regular Language Arts teaching (N=89)	.33 (p=.002)	-.03 (ns)
Time spent teaching GALAXY per theme (N=59)	.38 (p=.002)	-.12 (ns)
Frequency of use of the fax machine (N=74)	.35 (p=.002)	-.10 (ns)

(ns)=not significant

The variables that have an impact on performance, as detailed in Table 6, point to an intensity of use in the GALAXY classrooms. If we combine these variables, the data suggest that the most effective classrooms: embraced GALAXY more fully, tending to use its rich array of activities as a complete curriculum; spent more time in teaching GALAXY; and, very interestingly, made much greater use of GALAXY's primary interactive instructional component, the fax machine.

The three tables following show the effect of these three factors, when categorized, on average Vocabulary and Reading Comprehension gains in these classrooms.

Table 7. Mean Scale Score Gains for GALAXY Supplement/Replacement Classrooms

	Used GALAXY as a Language Arts Supplement (79 teachers)	Used GALAXY as a Language Arts Replacement (10 teachers)	t	p
Vocabulary Scale Score Gain	12.5	21.1	3.25	.002
Reading Comprehension Scale Score Gain	7.5	6.4	-0.26	.80

As Table 7 indicates, the few teachers who reported using GALAXY as a replacement for their traditional language arts teaching produced notably greater improvement on Vocabulary scores (p=.002). This could be interpreted as an affirmation that an effective meaning-based approach, such as that made possible by GALAXY, can be particularly effective in enhancing Vocabulary achievement, an important cognitive measure. At the same time, we must acknowledge the possibility that these ten teachers differed in other ways, as well, that may have made them more effective teachers. For example, they may have been more committed to the GALAXY philosophy than other teachers, or they may have been real trailblazers for their schools.

V. Reading

We should note that the GALAXY Institute staff explicitly encouraged teachers and principals to think of GALAXY language arts as a supplement, not as a replacement, for their ordinary instruction. It would appear that these ten teachers, however, did use it as their only Language Arts instruction.

Time spent teaching GALAXY

The evaluation ascertained the time spent teaching GALAXY from logs submitted by teachers as they worked through the seven GALAXY themes. The performance of students was examined for teachers who spent particularly large, particularly small, and average amounts of time teaching the GALAXY curriculum. Table 8 contains the results of those computations.

Table 8. Mean Scale Score Gains by Time Teaching GALAXY

	Lowest 25 percent time on GALAXY	Middle 50 percent time on GALAXY	Highest 25 percent time on GALAXY
Vocabulary Scale Score Gain	11.1	15.1	20.4
Reading Comprehension Scale Score Gain	9.3	7.8	12.3

The 25% of teachers who spent the most time teaching GALAXY produced substantially larger gains in both Vocabulary and Reading Comprehension. For the Vocabulary gains, there were statistically significant differences in gain between the highest and lowest quartile, while for Reading Comprehension the differences approached significance.

Table 9. Mean Scale Score Gains by Frequency of Fax Machine Use

	Occasionally or not at all (18 teachers)	Once per week (11 teachers)	2-3 times per week (49 teachers)
Vocabulary Scale Score Gain	8.6	10.6	15.8
Reading Comprehension Scale Score Gain	3.4	7.4	9.1

Similarly, the data in Table 9 appear to offer confirmation of the utility of GALAXY's unique interactive component, the classroom use of a fax machine, particularly when looking at the extremes of fax usage. Those teachers who reported using the fax two or more times a week—an expected utilization for a GALAXY classroom—had classrooms

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that produced standardized test score gains almost twice as high on both Vocabulary and Reading Comprehension as those who used the fax only occasionally or not at all.

The interpretation of this result will be further discussed in Chapter 8 on the overall importance of interactivity. It would appear that the effectiveness of GALAXY in improving reading proficiencies is enhanced by classroom utilization of the fax.

Discussion of the "GALAXY Intensity" factors

Throughout this chapter, we have noted the greater impact on Vocabulary than on Reading Comprehension of factors related to the intensity of students' GALAXY experience. In contrast, Tables 3 and 4, at the beginning of this chapter, show that overall there were quite large Reading Comprehension differences favoring GALAXY relative to comparison students. In other words, the Reading Comprehension gains were less dependent on the reported degree of teacher commitment to the GALAXY curriculum.

One speculative explanation for what we observed is that almost all of the GALAXY curriculum stimulates the growth of meaningful understanding, the proficiency measured by Reading Comprehension. Reading or hearing the teacher read the GALAXY literature, discussing that literature in small groups and in class, and doing related activities could be expected to contribute gains in comprehension proficiency.

The relative gain in vocabulary proficiency, on the other hand, may well be more dependent on the amount of exposure to certain specific learning experiences. Whole language research suggests that the more one reads and the more one writes, the greater one's mastery of vocabulary. It is thus reasonable, at least, to believe that in those classrooms where more time was spent on GALAXY activities, and where the greater use of the fax promoted more student writing, greater vocabulary mastery would result.

Comments on GALAXY's Reading Strategies

The case study observations suggested that students spent a relatively small amount of instructional time reading on their own, while they spent a good deal of time hearing the literature read to them, discussing ideas from the literature with other children in cooperative groups, and writing. The CAT/5 data suggest that this kind of experience transferred to higher scores on tests that demand reading for meaning and comprehension of written vocabulary, an affirmation of GALAXY's effectiveness in delivering meaning-based instruction.

At the same time, one of the most consistent recommendations coming from teachers in the case study schools observed by FWL was that a larger number of copies of the GALAXY literature be made available, to permit increased reading both in class and

outside of class. Having set the stage so well for the enjoyment and understanding of literature, it would seem appropriate to encourage schools to nurture that interest to the maximum possible extent, by making available as many of the excellent books selected by GALAXY as possible.

Summary

GALAXY's literature-based reading strategies proved extraordinarily popular with both teachers and students. Many teachers modified the way they taught language arts, including its reading component. Students were very enthusiastic about the literature that they read and had read to them. They also showed promising changes in their attitudes toward reading, reporting a greater propensity to read books on their own time and to feel that they themselves were good readers.

The analyses of CAT/5 test scores show significant advantages to students who have participated in GALAXY, as contrasted with those in comparison classrooms. Based upon the more generalizable sample of 146 classrooms, in Vocabulary, the average growth of student proficiency was 37% greater than for comparison students; in Reading Comprehension, growth was one and a half times as great. The result was that experience with GALAXY ameliorated the relative decline in language proficiency scores that is characteristic of disadvantaged students and that was found in the comparison classrooms.

There was, however, wide classroom-to-classroom variation, both in achievement and in implementation of GALAXY. An analysis shows that the classrooms in which GALAXY was taught for the greater time had appreciably higher scores, particularly on Vocabulary. For a subset of classrooms where teachers chose to substitute GALAXY for their traditional language arts teaching, Vocabulary gain soared to twice that of comparison classrooms. And for classrooms that used the fax capability of GALAXY as expected, two to five times a week, higher Vocabulary gains resulted. The impact of these factors was more limited, although in the same direction, for Reading Comprehension. Those gains would be sufficient, in the case of vocabulary development at least, to raise the rank of students relative to their more advantaged counterparts throughout the nation.

These findings suggest that the full potential of GALAXY has not yet been reached. Because of an uneven implementation in this demonstration phase and technical problems that prevented the fax from being effectively used for long periods in a number of classrooms, the utilization of GALAXY was less than optimal in many classrooms. The data suggest that, when GALAXY is more fully implemented, even more significant cognitive gains may be achieved.

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V. Writing

"GALAXY encourages me to have my students think, think, think and write, write, write!"

—comment from GALAXY teacher

Introduction

Student writing receives a strong emphasis in the GALAXY Language Arts curriculum for grades three through five. FWL researchers gathered observations related to writing during the GALAXY Language Arts cycle from interviews with teachers and students conducted during case study site visits. This chapter begins with teachers' views on student attitudes towards writing. Next, students' own words will be used to illustrate their views on writing. Additionally, the end of year teacher survey generated comments on writing. This chapter then discusses findings from two types of writing measures designed to demonstrate students' ability to write persuasively, the pre/post writing prompts and four embedded performance assessments.

Teacher Reflections on the GALAXY Writing Experience

The emphasis on writing in the GALAXY Language Arts curriculum and classroom activities has had a positive impact on students, according to their teachers. This finding is based on evidence from the end of year teacher survey and from interviews with teachers at the case study sites.

Survey Findings

Data and comments from the end of year teacher survey corroborate the finding from the case study schools that teachers have observed positive changes in their students' writing behaviors. In discussions with FWL researchers, a number of teachers at the case study sites reported that their students were writing more and writing better as a result of GALAXY. Their observations are supported by the teachers' responses on the end of year teacher survey; over one hundred teachers responded to this survey. As Table 10 shows, all the responding teachers thought that GALAXY did "very well" or "somewhat well" in helping students to brainstorm their writing ideas, and over 95% similarly rated GALAXY in terms of encouraging students to write more frequently. Writing for a real audience also scored well with the teachers, with all but one of them rating GALAXY as doing "very well" or "somewhat well" on this dimension. These ratings which reflect positive changes in students' writing behaviors may well be related to GALAXY's innovative use of the fax machine to communicate with the broadcast producers, *THE MAX*, and partner schools. Students' use of the fax machine will be discussed in greater detail in Chapter VII on interactivity.

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Table 10. Teacher Rating of GALAXY Influence on Writing Behaviors
(Percent of 102 Teachers)

How well does GALAXY help students to	Very Well	Somewhat Well	Not Very Well	Not At All
Brainstorm to generate ideas for writing	77.5	22.5	0.0	0.0
Write more frequently	82.4	14.7	1.0	2.0
Write for "real" audiences	76.2	22.8	1.0	0.0

In addition to rating writing behaviors as GALAXY outcomes on the end of year teacher survey, teachers were asked to give their impressions of whether various student attitudes and outcomes were true for most, some, a few, or not true for any of their students. To provide some context for the writing and reading outcomes, it is useful to know that the highest rating of any outcome was agreement by 92.3% of the teachers that it was true for most or some of their students. Given this context, the writing dimensions fared extremely well as Table 11 indicates. Overall, the highest rated item was agreement by teachers that some or most of their students were more willing to undertake writing assignments. And a majority of teachers (90%) agreed that most or some of their students were more willing to write on their own as a result of GALAXY. Perhaps the best news for GALAXY in this area is that 91% of the teachers reported that most or some of their students had developed a better attitude towards reading and writing after exposure to the GALAXY language arts program. Eighty-one percent thought that most or some of their students were reading more.

Table 11. Teacher Rating of GALAXY and Writing Assistance (Percent)

Since GALAXY began, my students	True for Most	True for Some	True for a Few	Not True for Any
Are more willing to undertake writing assignments	54.8	37.5	5.8	1.9
Are more willing to write on their own	51.0	38.5	7.7	2.9
Have a better attitude about reading and writing	59.0	32.0	9.0	0.0
Read more	51.0	29.8	17.3	1.9

When asked to choose the three most important results of GALAXY for their students in the end of year survey from among these and nine other items, more teachers selected aspects of writing than any other topic. The top two vote-getters among the thirteen choices both had to do with writing: 40% of teachers selected producing better attitudes among the students towards reading and writing as a significant outcome of GALAXY, and 38% of the teachers selected an improved willingness of students to do writing assignments as one of their three most important outcomes. (Complete results of the end of year teacher survey appear in Appendix K.)

Process Writing

The GALAXY Language Arts curriculum emphasizes the various aspects of process writing (e.g., pre-writing, drafts, revising for meaning, editing, and final production). Both case study data and survey data confirm that GALAXY students did not engage in much process writing during the course of the fourteen-week GALAXY cycle.

Although many of the suggested GALAXY activities are pre-writing tasks (e.g., mapping, webs, Venn diagrams, and note taking), and students were often observed engaging in various pre-writing exercises, an analysis of student written work kept in the portfolios of fifteen of the GALAXY classrooms at the case study sites indicates that a relatively low percentage of their total GALAXY writing work was of this type (15.9%). In three of these classrooms, where pre-writing was the predominant writing task found in portfolios, 39.0% of the student work was of this type. A further analysis of the extent to which pre-writing work was linked to subsequent writing products (e.g., drafts, edited work, final products) revealed very few such linkages. In addition, there was little evidence that students had opportunities for editing and especially for revising their work.

**Table 12. Teacher Rating of GALAXY Influence on Writing Behaviors
(Percent of 102 Teachers)**

How well does GALAXY help students to	Very Well	Somewhat Well	Other
Revise writing for meaning	37.6	54.5	7.9

The end of year teacher survey confirms this view from the case studies that very little fully-developed process writing was taking place. In contrast to other aspects of GALAXY rated more highly by a majority of teachers (as we saw above), only 38% of the teachers thought that GALAXY did very well at assisting students to revise for meaning (although an additional 55% of the respondents thought GALAXY did this task somewhat well).

The hectic pace of the GALAXY language arts cycle may explain the lack of process writing. As one teacher said,

> "Because there was always a time constraint, it was difficult to find time for revising. For example, we'd watch the 'A' show on Tuesday and anything being faxed to THE HOUSE had to be ready by Wednesday morning. Not enough time to write, think about, edit and rewrite."

In order to allow for more process writing in the future, GALAXY should consider allowing more time between the A and B shows and a bigger window for faxing to THE HOUSE.

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Teacher Open-Ended Comments

At the case study schools, almost all teachers report that in the GALAXY language arts program their students are writing more and with much more fluency than they thought possible. They report this to be true for students of all ability levels. In fact, there are dramatic stories about individual students who have begun writing "in volumes" since they have been part of GALAXY. Teachers recognize that GALAXY has equipped them with important tools that have been instrumental in increasing students' writing: the activities guide; the highly popular broadcasts, which present their students with real problems about which they want to express an opinion; and fax machines, which encourage students to write to a real audience.

In general, GALAXY teachers were aware that how they taught writing had changed, that students were more willing to write, and that students' writing had improved as a result of their collective GALAXY experience. Here are some comments that teachers made when they reflected on what GALAXY had meant for them and their students:

Changes in teaching writing

"GALAXY has brought about a change in my teaching of writing. I allow my students to take chances and experiment with language. Daily opportunities are provided now for writing for various purposes. I realize that writers can move back and forth between steps rather than through a series of steps with correct spelling and punctuation."

"I have finally realized that when you make their writing assignments more personal, the students write more, write better, and they 'think' about what they're writing."

"[GALAXY] has helped me see how to teach writing much more effectively."

"I have stressed writing for ideas more & then build into the grammar."

Changes in students' willingness to write

"Using the GALAXY program has increased my students' learning ability. They are eager to write their thoughts down. It encourages the students to brainstorm their ideas."

"It has also motivated the students to want to write more—they love to write to THE HOUSE, etc."

"The children automatically, without being told to write, wanted to write."

"Love the quick writes! Many times when the show is over they just start writing about what happened and then start preparing faxes. Many report on books they're reading & link it with a GALAXY Theme."

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Improvement in student writing

"I noticed an improvement in writing—more so than in past years."

"The writing skills of my students has surpassed my wildest dreams. We've all benefited from the GALAXY Program!"

Ability levels of students

"We are ability grouped. We observed that the low achievers profited more than the high achievers. We felt that the high achievers would have progressed regardless."

"Since GALAXY I have seen a tremendous improvement in my LD Resource students' writing. The more we write, the better their writings get."

Student Attitudes Toward Writing

Although a student attitude survey failed to uncover significant changes in student attitudes towards writing, small-group interviews with students at the case study schools did show that students recognized many of the attributes of GALAXY writing.

One of the scales of the student attitude survey was designed to measure attitudes toward writing. The seven writing items in the writing scale sought to probe student attitudes toward themselves as writers, the amount of writing they did at school, the importance of learning to write well, and revising their writing. Writing items were phrased like the following item: "Some kids wish they could do more writing in school BUT Other kids wish they could spend less time writing in school." (See Appendix B for the full text of the student attitude survey.) Students were then asked to choose which of the statements applied more to them and whether it was really true for her/him or sort of true. However, neither the change in this scale overall nor the change in any of the items in the scale was significantly different for GALAXY students as compared with comparison students.

Students in all the case study sites appeared to be aware that their GALAXY writing differed from prior language arts writing experiences. When asked to describe the kind of writing assignments they did in the previous school year and the kind they do in GALAXY, they noted very different types. Previous writing assignments were frequently described in terms of book reports, writing about newspaper articles, writing stories using spelling words, doing reports on famous people, doing reading skills workbooks, keeping journals, writing sentences, and completing dot-to-dot coloring sheets. When asked to tell about the kinds of writing they were doing in GALAXY, students across all sites were able to provide examples of writing more, writing for an authentic audience, and writing about important topics. They offered the following examples:

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Writing More

"now we write a lot—we write poems and stories and letters to the kids at THE HOUSE"

"writing a lot of letters"

"we write much more—letters, faxes, pre-writing, and brainstorming"

Writing for an Authentic Audience

"writing different types of documents including faxes, raps, birthday cards, and letters"

"letters to Gloria, Cliff, Andrea and Sue" (note: these were performance assessment letters written to the FWL GALAXY evaluation team)

"we get to tell our special ideas to other people around the United States."

Writing About Important Topics

"writing about important topics and other neat stuff"

"writing about problems and solving them"

"making predictions"

"writing solutions to problems, giving you a better opportunity to learn about real life"

"writing about helpers, heroes, and people who need people"

"writing about the shows"

"we write about our opinions"

"advantages and disadvantages charts"

"writing letters about problems like Nessie"(note: one of the writing prompts)

Measures of Student Writing Ability

Two different types of writing assessments were developed by researchers from the Educational Testing Service (ETS), in collaboration with researchers at Far West Laboratory, and given to GALAXY students: pre/post writing prompts, administered in January and May 1993, and embedded performance assessments, administered during weeks 4, 6, 12, and 14 of the GALAXY language arts cycle.

Pre/Post Writing Prompts

Two comparable writing prompts were used in the GALAXY Language Arts evaluation. In consultation with staff at the GALAXY Institute, FWL and ETS chose "persuasive" writing prompts as being closest to the GALAXY curriculum objective of facilitating the students' ability to take a stand and support it with evidence. As generalized writing tasks not linked to the GALAXY curriculum, these two prompts were considered suitable for and administered to both GALAXY and comparison students before and after GALAXY.

For the pre-test writing prompt, the FWL researchers used the National Assessment of Educational Progress (NAEP) "persuasive" writing prompt for grade 4 for the pre-test. A comparable writing prompt, developed by the FWL team, was used for the post-test. ETS conducted a comparability study of the two prompts to ensure that the tasks were similar. They administered the two tasks in counterbalanced order to two classes in the same grade approximately one week apart. Their results showed that there were no significant differences between the two writing prompts.

The scoring rubric developed by NAEP for scoring the writing prompt was used to score both pre- and post-tests. A six-point scale (1 to 6) was used to differentiate among the writing levels exhibited by the students. (See Appendices C, D, and J for the text of the writing prompts and the rubrics.) Both pre- and post-GALAXY administrations were scored in a single sitting by ETS in order to remove as much variation as possible from the scoring. Ten percent of the papers were scored by two readers and re-scored by the chief reader if their two scores differed by more than one point. Reliability among the readers was assessed to be high.

The writing prompts proved to be a powerful enough measure to detect writing gains among the students. To help us determine the educational significance of these gains, consider the different initial scores (score on the pre-test writing prompt) for students in the three grades as indicated in Table 13:

Table 13. Writing Prompt Scores by Grade for GALAXY and Comparison Students

Grade	GALAXY Only (N=1061)			Comparison Only (N=631)			All Students		
	Mean Score on WP1	Mean Score on WP2	Mean Gain	Mean Score on WP1	Mean Score on WP2	Mean Gain	Mean Score on WP1	Mean Score on WP2	Mean Gain
3	2.56	2.86	.30	2.55	2.75	.20	2.56	2.82	.27
4	2.83	3.09	.27	2.91	3.02	.11	2.86	3.07	.21
5	3.18	3.14	-.04	3.18	3.26	.08	3.18	3.19	.01

Table 13 shows that, for all students combined, the difference in initial scores between grades 3 and 4 and between grades 4 and 5 is about .3 on the pre-test Writing Prompt (WP1). We would then expect to see a gain between .3/3 (since January to May is

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about 1/3 of calendar year) and .3/2 (since January to May is about 1/2 of an academic year). We therefore expected to see a gain of between .10 and .15. What we found was that GALAXY students had a mean gain of .125 and comparison students had a mean gain of .136. Both of these gains are statistically significant at the .01 level, indicating that a real gain in writing performance has been measured. However, as one might imagine from the similarity of the gains of the two groups, there was no statistically significant difference in gain between GALAXY and comparison students. Moreover, differences in initial scores did not account for the slight differences in gain between the two groups since they had initial means on WP1 that were not statistically different: GALAXY students overall had a mean of 2.90 and comparison students scored 2.86.

There were some differential gains by grade, as the Table 13 indicates. The lower mean gain for the fifth graders may be partially attributable to a ceiling effect of having a scale that ranged only from 1 to 6 and using the same scale for all three grades. That is, fifth graders started higher and did not have as far to go. As Figure 6 shows, the GALAXY students did gain more than comparison students in third and fourth grades. Indeed, they seem to be rapidly making up ground: the GALAXY third graders have WP2 scores that are higher than the WP1 scores of the fourth graders, and the fourth graders have WP2 scores that are not too different from the WP1 scores of the fifth graders. The fifth graders, however, had disappointing results, as Figure 6 shows.

Figure 6. Writing Prompt Gains: GALAXY and Comparison Students

- Both Galaxy and Comparison students made significant gains
- No significant difference in gain between Galaxy and Comparison students
- Measured ability to "take a stand" in writing
- N=1,692 Students (1,061 Galaxy and 631 Comparison)
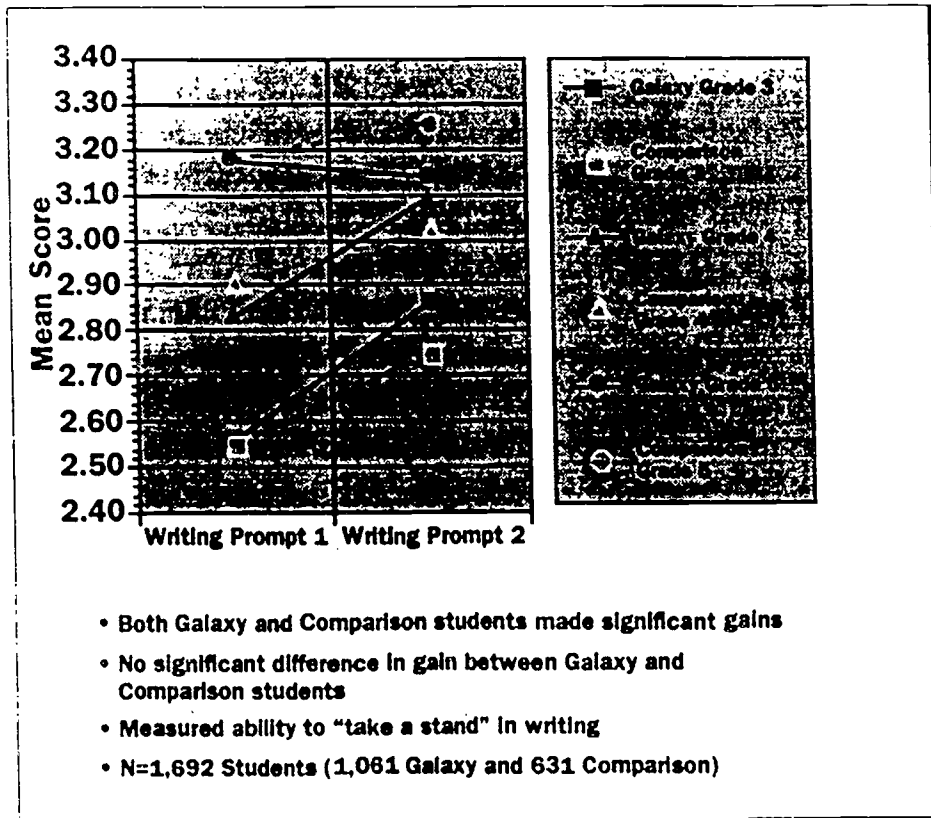
At the classroom level, the results were quite similar. Figure 7 shows that when both GALAXY and comparison classrooms are ranked from highest to lowest, GALAXY classrooms usually, but not always, display greater writing gains. However, there are enough occurrences of similar scores to prevent the overall pattern from being statistically significant.

Figure 7. Mean Writing Prompt Gains for GALAXY and Comparison Classrooms
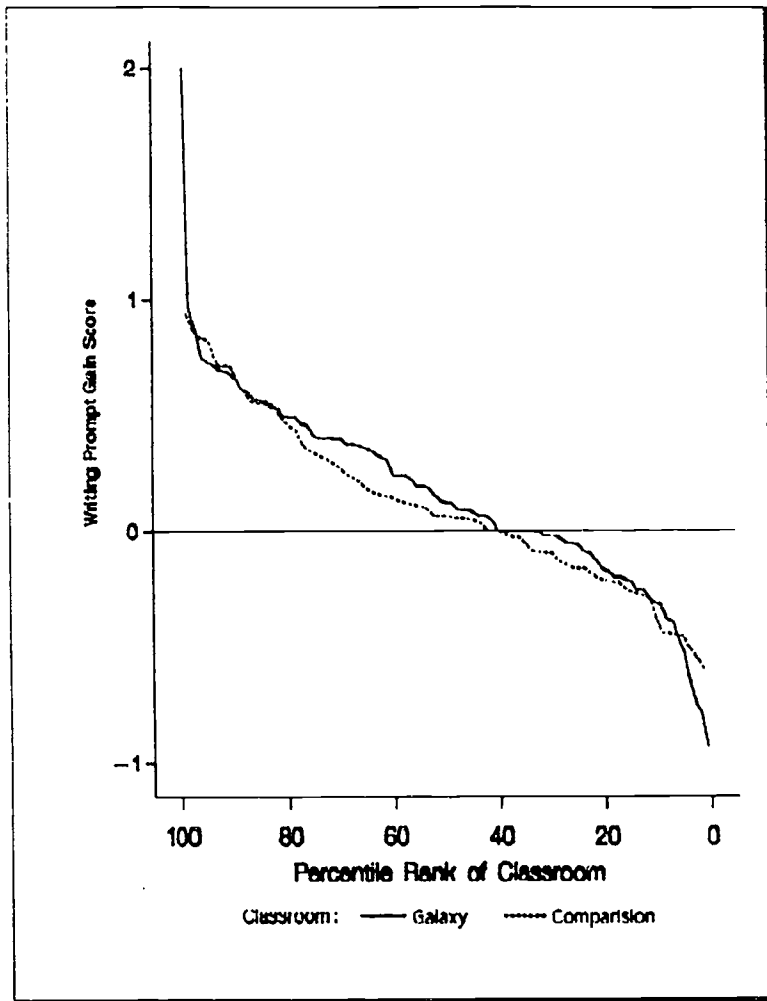
In summary, the good news is that GALAXY students made writing gains of the magnitude that were expected, but then so did the comparison students. The data show that GALAXY students did not perform significantly better than comparison students on this "persuasive" writing test.

There are a couple of possible interpretations for this, one having to do with the scoring rubric and another having to do with the restricted scale used. The NAEP scoring rubric for the first writing prompt and the nearly identical one for the second writing prompt were designed to measure "persuasion through articulation and support of a

position." Further, the scoring rationale "requires respondents to take a position" about the issue in question (whether to allow a spaceship to return to its planet for WP1 and whether to capture the Loch Ness monster for scientific purposes for WP2) and "to provide reasons to support their position." The writing tasks thus tested increasing ability to take a stand, that is, to marshal evidence in support of an argument; this is one of the key objectives of the GALAXY language arts curriculum. However, the experience of the GALAXY students with "taking a stand" in writing may have been minimal due to the relatively short time allotted to each theme (2 weeks). Classrooms tended to discuss issues related to the themes, rather than to write about them.

It is quite possible that GALAXY students' writing changed in other ways than in their ability to marshal evidence. For example, the students may have learned to write more easily or to write more in less time or they may have become more willing and confident to undertake writing tasks.

The writing prompts may not have been sufficiently sensitive to pick up small changes. It is possible, for example, that changes in GALAXY students' ability to take a stand were not sufficiently large to be picked up on a 6-point scale that spans such a broad ability range.

Embedded writing performance assessments

In consultation with FWL and GALAXY, ETS developed four performance assessments based on activities in the GALAXY teacher's guide. The four assessments were designed as two pairs: the first and last performance assessments took place at the end of themes 2 and 7 (PA1 and PA4), and they were designed to allow the maximum time between assessments in order to pick up a gain. The middle two took place at the end of themes 3 and 6 (PA2 and PA3). Since the assessments were integrally linked to the GALAXY curriculum, there were administered only to GALAXY students and not to comparison groups.

The contexts for the writing tasks varied somewhat. PA1 and PA4 referenced the GALAXY broadcasts as the framework for the writing tasks. PA2 and PA3 both used a short written real-life story as the context for the writing assessment. Because PA2 and PA3 could be done by students not familiar with GALAXY, ETS used them in a comparability study to ensure that the two tasks were similar. To test comparability, ETS staff administered the two assessments in counterbalanced order to two classes in the same grade approximately one week apart. The students received no instruction directed to the tasks during the intervening week. The results from this study showed that there were no significant differences between the two performance assessments.

Rubrics for scoring the two pairs of performance assessments were developed by ETS and FWL to reflect increased mastery of "taking a stand." To the extent possible, facility with grammar, spelling, and punctuation were not included in the score. All

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performance assessments for grades 3-5 were scored by ETS using the same 5-point scale (1 to 5).[4]

Table 14. Mean Scores by Grade for Two Pairs of Performance Assessments

Grade	PA1 and PA4			PA2 and PA3		
	Mean Score on PA1	Mean Score on PA4	Mean Gain	Mean Score on PA2	Mean Score on PA3	Mean Gain
3	2.29	2.48	.19	2.61	2.72	.11
4	2.66	2.78	.12	2.86	2.90	.03
5	2.80	2.77	-.03	2.87	2.88	.01
Overall	2.61	2.68	.07	2.80	2.85	.05

Although both pairs of assessments showed gains, the overall gains for the combined grades were small and not statistically significant (.07 for the mean gain between PA1 and PA4 (p=.11) and .05 for the gain between PA2 and PA3 (p=.22)). We expected to see less growth between PA2 and PA3 because the two latter assessments were administered closer in time than the other pair: Only six weeks separated the administrations of PA2 and PA3, whereas there were ten weeks between PA1 and PA4. The results confirm this expectation of less growth.

Although there was no statistically significant relationship between grade and initial score for either pair, the trend of the initial scores was in the right direction, starting somewhat higher as the grade increased in both pairs. As Table 14 shows, the average score for fifth graders was higher than for fourth graders, which in turn was higher than for third graders on both PA1 and PA2.

It is possible to do a "growth" analysis similar to that done for the writing prompts in order to get some idea of "expected gain." Looking at the scores for PA1 in Table 14 above, we can see that the difference between grades 3 and 4 is .37 and the difference between grades 4 and 5 is .14. Similarly, looking at the scores for PA2, the difference between grades 3 and 4 is .25 and between grades 4 and 5 is .01. Because the differences between the grades have such a range, it makes sense to restrict our discussion to the gain we might expect for third and fourth graders.

Viewing the ten weeks between PA1 and PA4 as 19.2% of a year and 25% of a school year, we might expect third graders to have gains of between .071 and .093 (19.2% of .37 and 25% of .37, respectively) on PA1. However, the mean gain of .19 was higher than that. Similarly, for PA2 and PA3, separated only by six weeks, we might expect third

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4 In addition, a score of 0 was assigned to those who failed to respond to the task (e.g., they only wrote their names).

graders to gain between .029 and .038 (11.5% and 15% cf .25) on the basis of the difference between third and fourth grades on PA2; they actually gained .11. The comparable figures for fourth graders for PA1 and PA4 are gains between .027 and .035 as compared with a measured gain of .12, and, for PA2 and PA3, gains between .001 and .002 (measured gain of .01). By this crude measure of what one might expect, the GALAXY students in both third and fourth grades exceeded expectations of gain on both sets of performance assessments. While these numbers are only suggestive, they do indicate that, with a larger sample size and more power to detect small changes, the performance assessment pairs may well show a writing gain.

Figure 8. Performance Assessment Gains During GALAXY Language Arts
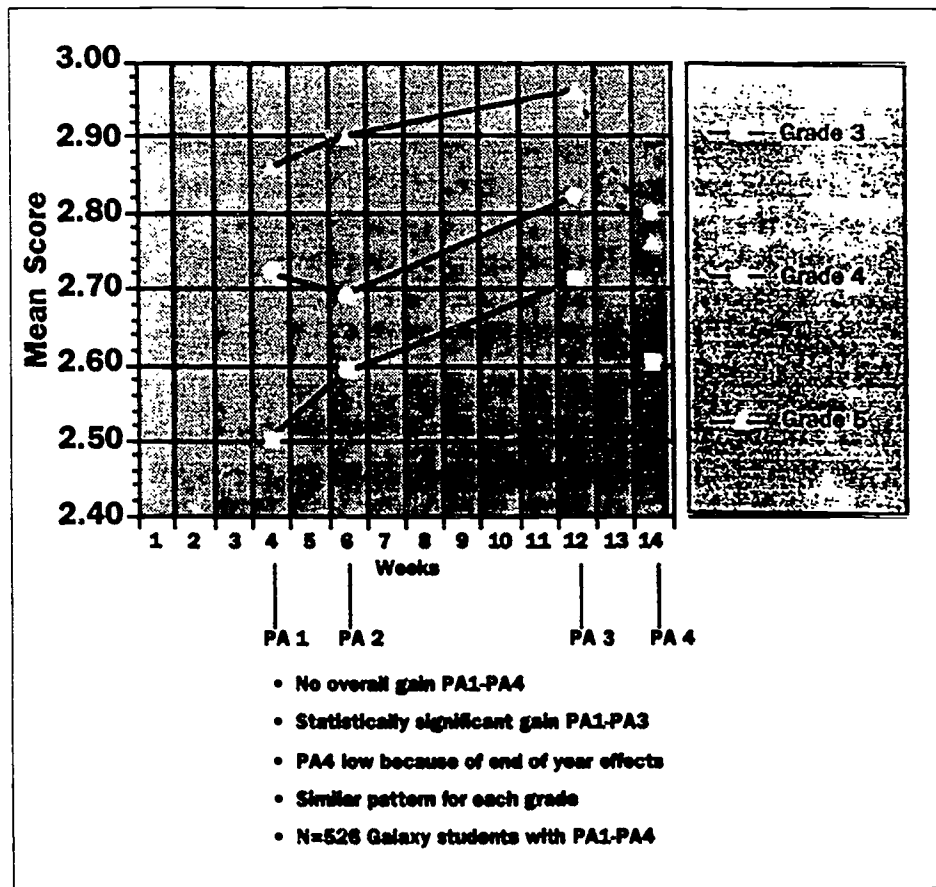
When one analyzes the performance tasks as repeated measures of the same skill ("taking a stand"), then a pattern emerges, as Figure 8 shows. The performance task scores for the 526 GALAXY students who have scores for all four performance assessments show statistically significant gains on the first three embedded performance assessments (PA1-PA3) when they are considered together. However, there is no significant gain when all four performance assessments are included because the scores on PA4 are low, as Figure 8 shows. We know that the fourth performance task was taken under different circumstances than the other three. This last task (PA4)

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Figure 8 also shows that the pattern of gains is not the same for all the grades. The gains for third and fourth graders show a similar trend, but the gains for fifth graders appear to somewhat flatten out, possibly reflecting a ceiling effect from the scoring rubric.

In summary, the statistical results from the performance assessments are somewhat mixed. When viewed as a series, the performance assessments reveal statistically significant gains among GALAXY students when the fourth performance task is excluded. Yet when viewed as two pairs of assessments, the gains are not statistically significant.

Several factors, similar to those for the writing prompts, offer partial explanations for the lack of significance of the paired-task analysis. One factor relates to a poor rate of return that diminished the sample size and adversely affected the probability that a statistically significant difference could be found. Many teachers did not return both halves of an assessment pair for one reason or another,[5] and a number of schools closed for the year before reaching theme seven and its accompanying PA4. Another factor that may account somewhat for the lack of significance is the relatively short time frame between the two assessments in a pair.

Summary of Findings on Writing

The teacher survey, teacher interviews at case study sites, and student interviews all support the finding that GALAXY students were writing more and were more aware of what they were writing. Rounding out the picture of GALAXY writing, FWL researchers also found evidence that GALAXY classrooms were not employing the full range of process writing, but rather they were concentrating on pre-writing activities. That is, students seemed to have many opportunities to talk about different sides of an issue and to work in small groups, but their GALAXY writing was more limited to quick-writes and jotting down faxes and ideas. The evidence suggests that developing arguments in writing was not an extensive part of the GALAXY experience for most students.

The scoring rubric for both the writing prompts and the performance assessments reflected an increasing ability "to take a stand," that is, to marshal evidence in support of an argument; this is one of the key objectives of the GALAXY language arts curriculum. As one can see from looking at the rubrics in the appendices to this document, the rubrics were not designed to measure whether a student wrote more in later assessments, whether writing came more easily to the student, whether language mechanics such as spelling and punctuation improved, or whether sentences were somehow better constructed.

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[5] 1676 students had both WP1 and WP2. The sample size for PA1 and PA4 was 640, and the sample size for PA2 and PA3 was 811.

Thus it is not surprising that the six writing tasks used in the evaluation produced mixed results in terms of writing gain: The writing prompts failed to show a statistically significant difference between GALAXY and comparison students, but the analysis of the performance assessments featured a statistically significant trend of increasing scores when the anomalous fourth task was excluded. One possible explanation for the mixed results is that, because they focused on students' ability to support a position with evidence, these six tasks may not have measured the principal area of writing gain during the fourteen-week GALAXY span. Other changes in writing behaviors and attitudes, such as willingness to write and ease of writing, might logically precede growth in ability "to take a stand." These behaviors and attitudes were not measured by the writing prompts and performance assessments.

It may be possible to measure better significant changes in writing ability over the fourteen-week GALAXY period by focusing more on writing fluency, writing volume, and less complex elements of writing structure than "taking a stand." It is also likely that a longer theme cycle, which will allow teachers time for more process writing, will produce changes in students' writing that will be reflected in a number of different measures of writing ability.

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VI. Teacher Attitudes and Practices

Interventions to improve teaching will succeed only if classroom teachers embrace them as both useful and manageable. Our evaluation therefore carefully appraised the attitudes of teachers toward the implementation of the GALAXY curriculum and its several elements.

There were three sources of data for this inquiry: a survey on attitudes and practices with regard to teaching language arts given before and at the conclusion of GALAXY; observations of teaching and repeated interviews with teachers at seven schools throughout the semester; and an extensive end of year survey on the use of GALAXY and perceptions about the usefulness of its components.

Teacher Responses to GALAXY

All of our evidence supports the conclusion that GALAXY was well-received by participating teachers throughout the nation. Individual interviews, discussions at the in-service training institutes, and survey results all agree: virtually without exception, teachers expressed great enthusiasm for GALAXY language arts.

One element of evidence derives from the end of year survey, when teachers were asked to assess the educational value of the GALAXY components, as having "great value," "some value," or "little value." The principal GALAXY elements were rated highly: the percentage of teachers judging that each element demonstrated " great value for educational purposes" were as follows: 95% for the broadcasts, 92% for the themes, 87% for the classroom activities, and 94% for the GALAXY literature. Only 1 of 102 respondents rated any of these components as having little value.

Even fax machine use, which in several classrooms was marred by persistent technical problems, was rated as having "great educational value" by 77% of GALAXY teachers and some value by 19% others. Only four teachers rated it as of little value.

Even more impressive were responses to an open-ended question asking, "How has GALAXY affected your teaching?" Of 88 respondents, we would rate 85 as clearly positive, one as neutral, and two who responded by saying they had some trouble incorporating the large number of possible activities into their teaching.

The degree of enthusiasm is what is most remarkable, and it is exemplified by the following remarks:

> "GALAXY is exactly what I had hoped for to "perk up" my 20 years of teaching experiences. I was feeling very "burned out" with teaching— GALAXY has put me "back on track."

> "I'm more motivated. Teaching is more fun. I can follow the excellent plans easily and enthusiastically and it saves me time. It's very thrilling—Keep it up!"

"It has made me a far better teacher!"

"I am a 25 year veteran teacher. GALAXY has brought "new life" to my teaching. It is well planned and fun to do!"

"GALAXY has been like a shot in the arm for me. I LOVE IT!"

"GALAXY helped me tremendously as an English teacher. GALAXY raised my self-esteem as it made me feel like more of a part of the technological world that we live in."

"My students and I became very close as we discussed and explored the GALAXY themes. Thank you for making my school year so enjoyable!"

"GALAXY has given me the burst of excitement I needed. After teaching 14 years, I was experiencing "burn out" and this has excited me. Thank you!"

"GALAXY has had a tremendous effect on my teaching. I have seen apathy among students in the last several years. Now I see active participation and success. The children's self image has improved."

"I have thoroughly enjoyed teaching this year because of GALAXY."

"I love the GALAXY program!!"

As these responses show, teachers were not simply dazzled by GALAXY's array of new instructional inputs. Their enthusiasm arose from their ability to use GALAXY to teach in new ways and to engage their students with new depth. That enthusiasm was sustained by seeing their students' excitement and the learning that occurred as a result.

Language Arts Teaching Attitudes and Practices.

GALAXY was designed to assist teachers to bring the richness of a literature-based meaning-centered approach into classroom reality. While there is now widespread acceptance of the value of such an approach, teacher experience with this very different style of teaching is limited. Therefore, we anticipated differences among teachers in their initial attitudes and practices with regard to meaning-centered teaching. We also wanted to ascertain whether experience with GALAXY led to a change in those language teaching attitudes and practices.

Teacher attitudes toward the teaching of language arts, together with self-reports of their typical practices, were assessed through survey instruments developed for this purpose. Questions were provided on both a pre-test and post-test basis. From these measures two scales were generated, a "Constructivist" scale and a "Language Fundamentals" scale. The two scales were retained as separate measures. In effect, some teachers believed in the utility of both meaning-centered, constructivist approaches and more traditional approaches, and they saw no inconsistency in combining them, while others saw them as opposite ends of a spectrum.

Initial attitudes and practices

On average, teachers began with extremely pro-constructivist attitudes. Over 90% agreed or strongly agree with statements on the survey such as:

- "Reading and writing activities, even for beginners, should focus on meaning and the functional use of written language rather than on exact word and spelling identification."
- "When children encounter an unknown word while writing, they should be encouraged to spell it out as best they can, but continue writing."
- "When children encounter an unknown word while reading, they should be encouraged to guess based on context and meaning, but continue reading."

At the same time, 40% to 50% concurred with a number of statements focusing on the use of phonics and more traditional methods for teaching language:

- "It is best to teach reading and writing in the following order: 1) letters, sounds, spelling; 2) words, vocabulary, sentences; 3) paragraphs; 4) stories."
- "Reading and writing skills are best developed through frequent drill and practice."
- "When a child does not know a word when reading, he or she should be instructed to sound it out."

A similar pattern displayed itself in those questions relating to actual practices. Very high percentages reported that they taught using the following meaning-based activities at least once a week:

Table 15. Teacher Pre-test Survey Results Related to Meaning Based Activities

	Weekly	2-5 Times per Week	Total
Using integrated reading and writing techniques	13%	78%	91%
Use of cooperative learning	19%	57%	76%
Reading and responding to literature	10%	80%	90%
Reading aloud to students	9%	89%	98%
Students choose their own literature and read silently	8%	88%	96%

Percentages were notably lower on one key question, the use of thematic activities in teaching Language Arts, where only 63% reported using thematic instruction at least once a week.

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However, there was also a high frequency reported for teaching language arts through more traditional or phonics-based methods. The following percentages applied to the use of these more traditional techniques at least once a week:

Table 16. Teacher Pre-test Survey Results Related to Traditional Techniques

	Weekly	2-5 Times per Week	Total
Teaching Language Arts using a basal reader	17%	47%	64%
Teaching students using phonics or word-attack strategies	30%	50%	80%

Attitudes and practices at the conclusion of GALAXY

Pre/post changes were modest on the constructivist scale items. Since teachers already had begun with nearly unanimous agreement about the virtue of meaning-centered language arts teaching, there was of course little room for positive change.

However, on the key issue of thematic teaching, frequency did change markedly: those reporting teaching thematically from 2 to 5 days a week increased from 42% to 65%. GALAXY thus resulted in a change in a very key area of 23% of its teaching population. At the same time, it is notable that even with GALAXY's carefully integrated thematic framework 21% of the teaching population reported teaching thematically less than once a week.

Opinions about the use of phonics and traditional teaching techniques did not change in any notable fashion—but reported practice did. The use of basal readers declined from 64% usage at least once a week to 48%. The reported use of phonics strategies declined from 80% at least once a week to 55%. Again, for a full one-quarter of GALAXY's teaching population, a significant change resulted.

Even though there were major changes in the use of traditional and phonics-based approaches, there remained a clear bifurcation among the GALAXY teaching population, with about half the teachers continuing to use phonics and basal readers fairly frequently, and others using them infrequently (less than once a week). The use of phonics can be interpreted either as a marker for a somewhat more traditional kind of teacher or for a teacher who is eclectic in approach. We have no way to distinguish between these two groups from the attitude survey.

Discussion

In spite of wide variation among teachers in background, teaching style, ethnicity, and region of the country, no one could fail to be impressed with the virtually universal enthusiasm of teachers for the GALAXY program. We found that enthusiasm to be based on a belief that GALAXY had helped teachers introduce a more interesting and

effective meaning-based approach into the classroom. It also reflected their daily observations of the enthusiasm of children for the GALAXY experience and a sense that it was reaching all children, regardless of ethnic background, poverty, or gender.

Will that enthusiasm be sustained over repeated experience with GALAXY? We cannot of course know. However, the portents are positive, in our judgment: the enthusiasm of children newly introduced each year to GALAXY should do much to sustain teachers' enthusiasm; the mastery of the fax technology, still daunting to some teachers, will grow and add renewed interest; and the wide variety of activity choices available to teachers through GALAXY can provide continuing interest and opportunity for creative teaching.

There are other very important elements of teachers' success that arise from the use of GALAXY's instructional technologies Because the television broadcasts are available on a precise schedule, a schedule around which the classroom activities are built, instruction is paced in participating classrooms; the likelihood of full utilization is thus increased. And in part because of the fax technology and the incorporation of classroom responses into both broadcast and fax communications, teachers feel themselves a part of a network, with all the social reinforcement that feeling provides.

While we cannot quantify the impact of these factors, they add much to the probability of continued teacher use, and continued teacher enthusiasm, for the GALAXY experience. As their mastery of GALAXY teaching strategies increases with repeated cycles, there is reason to believe that student learning outcomes may be even further enhanced.

VII. The Role of Interactive Technologies in GALAXY

Background

GALAXY is the first large-scale educational innovation for elementary students to make use of the fax machine as an integral part of a language arts curriculum. An audio-conferencing system, the hoot 'n holler, was also used as an additional means of promoting interconnection among classrooms. Both of these interactive technologies make use of GALAXY's satellite network.

The dedicated fax system made it possible for students to respond to requests for their views on issues raised in the television broadcasts, to write to other classrooms on any topic, and to write to a student response bulletin in the expectation of publication. Some of these activities, thus, were structured opportunities for interacting provided by requests from the characters in the show, while others depended on the initiative and interest of students and teachers.

The fax plays a prominent role in GALAXY because it has been assumed to be a major motivator for children's writing and a way to create a nationwide community of learners. Writing for fax transmission is writing about real topics to real people; this kind of writing can be an important element of meaning-centered instruction.

The classroom fax capability also has other potentially motivating features: it is a new and manageable technology, and it breaks down the isolation of the single-teacher classroom, linking children to their counterparts in very different and distant places.

The potential, then, seems very great. The use of classroom fax machines on a regular basis is a pioneering element of the GALAXY system. As a result, it was expected to be the element most likely to have initial difficulties, both in systems operation and in its integration into the instructional process. Our assessment has confirmed such initial difficulties, while also demonstrating the apparent instructional value of effective fax use.

What Teachers Said About the Fax

The contrast between interest in the fax's potential and the frustration of technical problems associated with it was reflected in teachers' responses to the open-ended end of year survey question asking for comments on the GALAXY technologies:

Technical problems

> "One of the things that I was most excited about was the fax machine and its motivational force in writing, I was disappointed that it was operationally inconsistent."

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"The fax machine became a source of frustration for both me and my students."

"My students initially were excited about the fax machine. They became disenchanted as their many faxes continued to be unanswered."

"Our fax was always messed up; we did fax within our school; we also were either taking or preparing for formal state testing. The class and I loved it, though."

"Something has to be done to clear up the busy signals on the fax. This was very frustrating."

"We tried the fax, but had trouble getting through so quit. Not being able to fax was a big disappointment. And I think we lost a lot of the educational benefit—the spontaneity of working a lot."

"We worked daily and weekly to get the fax machine to send faxes but we sent only one fax successfully. It has been most frustrating."

Classroom Interaction Issues

"The fact that our fax never seemed to work was very disappointing. The students attempted to fax materials to THE HOUSE and to our sister school to no avail."

"Our partner school never faxed us; it really disappointed my kids. We did fax and they loved it and we received a few from other schools."

"Response time is too long. Would it be possible to bypass the network and fax directly to partners? Students have forgotten or lost interest by the time they get a response."

"Apparently our faxes didn't make THE MAX. Students lost interest. We faxed quite often. I don't know what happened."

"Fax had great possibilities—but didn't receive many answers."

"Cooperative and enthusiastic fax partners would be nice. My kids were disappointed by the few responses we received."

"Received only two of THE MAX—called and reported several times. Sent lots of faxes, rarely received from them. Kept writing to their pen pals, but were disappointed when they never received any responses from them."

"Students really enjoyed writing faxes but became less enthusiastic, when faxes weren't returned to them in a more regular basis."

"Our GALAXY partners did not communicate at all with us through the fax machine. My kids were very disappointed about this."

Educational value

> "The fax has also motivated the students to want to write more—they love to write to THE HOUSE and to others."

> "Using the GALAXY program has increased my students learning ability. They are eager to write their thoughts down. The idea of seeing their [faxed] work on television or in the newsletter makes them want to work harder."

> "The writing response rate is high when we receive faxes from other schools, but varies greatly from student to student."

In personal interviews throughout the period of the study, the increasing frustration with the technical problems associated with the fax became clear. Teachers began with enthusiasm about the "real-world" character of the fax and its potential to link with teachers and students elsewhere. They also felt a lot of trepidation about their ability to use the technology, and they did not feel well trained in its use as the project started.

Gradually, as delays and technical glitches continued to haunt the system, disappointment and frustration grew in many teachers. While they learned how to use the system, too often it was down.

Another very widespread source of frustration was that classrooms frequently failed to get responses back from other classrooms they had faxed. Because of the way the system is configured, there is no automatic acknowledgment that a fax has been successfully sent, as there is in some commercial fax systems. This uncertainty and lack of reinforcement is a very serious problem for GALAXY, one that demands a technical solution and other steps. If system reliability becomes very high, and 95% or more of faxes go through, the problem would be largely solved. In addition, however, 'classrooms should be urged to respond with an acknowledgment fax as soon as one is received, even before a substantive reply can be generated.

Technical Operation and Reliability of the Fax

The fax system became operational at different times in different schools during this first iteration of GALAXY. Some schools had installation problems that delayed their coming online for a number of weeks. In addition, the computerized control system

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required to coordinate this unique dedicated satellite fax system required modifications during the early period of GALAXY's operation.

There also were classroom management challenges for some teachers associated with the newness of the technology. Problems resulted from the necessity for schools to adhere to a certain schedule for fax transmissions, a schedule required to accommodate the large number of faxes flowing over a satellite channel with limited bandwidth. There were difficulties in getting efficient repair of fax machines that were not working, delays exacerbated by the unfamiliarity of teachers with the machines and with ways to access the maintenance system (through an "800" number set up by GALAXY). The result of all these factors was markedly differential use of the fax. We asked each teacher to report on the number weeks the fax machine was operable during GALAXY's 14 weeks of activity. The results are in Table 17.

Table 17. Teacher Report of Weeks of Fax Machine Operability

	Number	Percent
Always worked	8	7.8
Inoperable 1-2 weeks	26	25.5
Inoperable 3-4 weeks	26	25.5
Inoperable 5-6 weeks	12	11.8
Inoperable 7+ weeks	27	26.5
Never worked	3	2.9

Thus, among teachers responding to the end of year survey, in only 8% of classrooms did the fax system work from the beginning to the end of the project, while in another 25% it worked except for one or two weeks. We must emphasize that these low figures include delays in start-up, not solely technical reliability after start-up. Nevertheless, the combination of the two meant a restricted ability in many classrooms to use this very interesting feature of GALAXY.

We asked a related question at the end of the year: "How frequently did you use the fax?" Here we believe teachers were responding to its use after initial start-up, and so they were reflecting in most cases the degree to which its instructional uses had become an integral part of their teaching of the GALAXY curriculum.

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Table 18. Teacher Report of Frequency of Fax Machine Use

	Number	Percent
Daily	11	10.7
2-3 time per week	48	46.6
Once per week	20	19.4
Occasionally	19	18.4
Not at all	5	4.9

By the end of the period, as Table 18 shows, more than half the teachers were utilizing the fax two to five days a week, which was GALAXY's intent. Twenty-three percent were using it only occasionally or not at all. (In some of these instances, the fax may not have been functioning.)

In spite of these difficulties, 76% of teachers rated the educational value of the fax as "great," and only 4% of those who had used it rated the fax as having little value (see Table 19).

Table 19. Teacher Report of Educational Value of Fax Machine Use

	Number	Percent
Great value	75	75.5
Some value	18	17.6
Little value	4	3.9
Did not use	5	4.9

An even more enthusiastic endorsement was teachers' judgments of how much students liked the fax, as shown in Table 20.

Table 20. Teacher Report of Student Interest in Fax Machine Use

	Number	Percent
Liked a lot	86	86.0
Liked somewhat	6	6.0
Did not like	0	0.0
Did not use	8	8.0

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Perceived student enthusiasm goes down somewhat as we differentiate the various uses of the fax, for communicating within the school to other classrooms, with other schools, with the characters in the television programs, and with the student response bulletin, as illustrated by the data in Table 21.

Table 21. Teacher Rating of Student Enthusiasm About Faxing (Percent)

Faxing Activity	Very Enthusiastic	Somewhat Enthusiastic	Not Enthusiastic	Did Not Work	Did Not Do
In-school faxing	52.5	15.8	4.0	2.0	25.7
Faxing to other schools	74.0	17.0	2.0	0.0	7.0
Faxing to THE HOUSE	81.2	13.9	0.0	0.0	5.0
Faxing to THE MAX	52.0	34.3	10.8	0.0	2.9
Receiving in-school faxes	46.0	23.0	27.0	0.0	27.0
Receiving faxes from other schools	69.0	9.0	3.0	1.0	18.0
Seeing faxes on the B-Show	80.6	13.6	2.9	0.0	2.9

Note that the highest ratings went to faxing to the characters in THE HOUSE and to seeing their faxes on the broadcasts. The overall conclusion from the data in Table 21 is that faxing was a considerable hit in the great majority of classrooms.

The Educational Results of Fax Use

The fact that classrooms varied greatly in their use of the fax, in part because of the initial technical problems, provided an opportunity to relate use of the fax to learning outcomes. This section focuses on the gains in GALAXY classrooms in Vocabulary and Reading Comprehension.

The overall correlation of the amount of classroom fax use and average student outcomes is .35 for Vocabulary, which is statistically significant (p=.002), and .10 for Reading Comprehension (which is not statistically significant). But this is not the whole story. Of particular interest was how different levels of classroom fax use relate to variations in student performance.

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Table 22. Teacher Report of Frequency of Fax Machine Use and Corresponding Vocabulary Scale Score Gain

	Percent	Average Vocabulary Scale Score Gain
Daily	10.7	14.6
2-3 times per week	46.6	16.1
Once per week	19.4	11.5
Occasionally	18.4	9.3
Not at all	4.9	6.7

There are striking differences between those using the fax at the suggested rate of two or more times a week and those below that rate. As Table 22 shows, in classrooms where the fax was used only occasionally, the average gain score on Vocabulary was only 9.3 points whereas those who used the fax two or more times per weeks gained 14 or more points. Frequency of fax machine use can be seen as an index of commitment to GALAXY, and, therefore, it appears that those classrooms with the higher interest had the greater student gain. These data would suggest that the use of the fax may be a very important part of GALAXY's success. Where it was rarely used, students performed only slightly better than those in non-GALAXY classrooms at GALAXY schools (9.3 vs. 8.7). Where it was used as intended, students did very well. Indeed, in classrooms that frequently used the fax, students gained somewhat in NCE and percentile scores when compared with the national norms.

We cannot rule out the possibility that some teachers who used the fax little were in other respects not very much involved in using the GALAXY curriculum or that they may have been ineffective for other reasons. Nevertheless, the differences found on this particular factor suggest a plausible interpretation that the use of the fax is integral to the educational success of GALAXY students.

Use of the Audio-Conferencing System

GALAXY's "hoot 'n holler" system links all classrooms through a "party line" telephone that is operable throughout the day. Teachers can use it to contact other classrooms by simply getting on the line and announcing throughout the system a desire to speak to a particular classroom. If that classroom is listening, then they can respond. GALAXY can also use it for more structured audio-conferences for training and administrative purposes.

What teachers said about the hoot 'n holler

The purpose of the hoot 'n holler was never clearly articulated by GALAXY, and this is reflected in comments from the teachers:

"The hoot 'n holler often served as a distraction."

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"I loved the hoot 'n holler!"

"Students were frustrated with the hoot 'n holler, because it was difficult to connect with classrooms (time zones, classes not having them turned on, etc.) and the clarity of the voices. It was used less as the program continued."

As Table 23 indicates, the system was used infrequently by the great majority of teachers.

Table 23. Teacher Report of Frequency of Hoot 'n Holler Use

	Number	Percent
Daily	3	3.0
2-3 time per week	9	9.1
Once per week	5	5.1
Occasionally	46	46.5
Not at all	36	36.4

Surprisingly, 66% of teachers attribute some educational value to the system, although only 20% say it has great value. These figures are the lowest for any component of the GALAXY program, by far. Teachers do say, however, that students like the system, as shown by the data from the end of year survey in Table 24.

Table 24. Teacher Report of Student Interest in Hoot 'n Holler Use

	Number	Percent
Liked a lot	24	25.8
Liked somewhat	17	18.3
Did not like	2	2.2
Did not use	50	53.8

Discussion

Most audio-conferencing systems used for education or training are centered around scheduled activities, such as training sessions or discussions of topics where sharing information is essential. Audio-conferencing systems are also used to provide audio feedback from many sites as part of teleconferenced training, where the television program is a one-way broadcast. All systems that operate seriously in these ways have online operations managers who serve to schedule linkages and to moderate discussions.

GALAXY's hoot 'n holler, however, was largely unscheduled and unintegrated into the educational process. It was used as a part of one teleconference centered on technical training, and otherwise it was left to the spontaneous use of teachers and/or students. It was ill-suited to the latter purpose.

Interviews with teachers have made it abundantly clear that they do not like having their classes interrupted each time someone in the network is trying to use the system. The result was that many turned the system off, so they were unable to hear requests that might have been directed toward them. The audio quality of the system was poor, probably because of low-cost equipment at the classroom level. And there were no effective means to arrange a conference with another classroom, aside from a commercial telephone call or trading a series of faxes, both too cumbersome for most teachers.

It is clear that the hoot 'n holler would not be missed if eliminated and that it is not workable in its present arrangement. It could, however, be utilized as an important part of scheduled teleconferences, both for in-service training and for linking classes throughout the system. Its potential for this kind of use has not been tapped and is worth exploring.

Summary of GALAXY's Interactive Role

GALAXY's unique interactive capability, in particular a system-wide fax network, is one of its most interesting and exciting features. The use of the fax appears to be a strong motivator of student interest and encouragement for writing, and it serves to link students to a wider world.

It also presents technical challenges that must be solved. For many classrooms in the demonstration phase, the fax came to work reliably enough to permit its use several times a week or even daily. Those classes produced the largest gains in reading scores, as measured by standardized tests. While follow-up throughout a period when the fax system is working more reliably is called for, the continued utilization of the fax as an integral part of GALAXY seems fully warranted.

VIII. Program Components

GALAXY language arts had a number of program components which all contributed to the total experience for the GALAXY students. These components engaged the attention of students and helped teachers to implement the GALAXY curriculum. They include the broadcasts about the children at *THE HOUSE*; the teacher resource materials including the suggested classroom activities; the use of small group instruction; the GALAXY literature books (each teacher had six books per theme); the take-home magazine, *THE SECOND STORY*; the response bulletin, *THE MAX*, that printed faxes received from student; and the staff development efforts of GALAXY, particularly the two Institutes for teachers. Each will be discussed in turn in this chapter.

Broadcasts

The broadcasts are the linchpin of the GALAXY program, and they are highly successful. Both the teachers and the students give the broadcasts almost universal approbation. As Table 25 shows, 99 out of 104 teachers (95%) who returned the end of year teacher survey thought the broadcasts had great educational value. An even higher percentage of teachers (97%, 101 of 104) reported that their students liked the broadcasts a lot. It looks like a win-win situation for GALAXY: high educational value and great kid appeal.

Teacher comments

Teachers at the case study sites consistently awarded the broadcasts high marks, praised their success at introducing and reinforcing the language arts themes, and recognized how the characters at *THE HOUSE* provided a common frame of reference for discussion of the themes. Repeated viewings of the broadcasts were a common occurrence, especially early in the cycle.

Several commented on how they appreciated the ethnic diversity of the cast and how the characters appealed to all types of students (rural, urban, Spanish-speakers, and all ethnic groups). Students identified strongly with the characters, believing that "the kids are just like us."

Table 25. Teacher Rating of the GALAXY Broadcasts

Educational Value	Number	Percent		How Much Students Liked	Number	Percent
Great Value	99	95.2		Liked a Lot	101	98.1
Some Value	5	4.8		Liked Somewhat	2	1.9
Little Value	0	0.0		Did Not Like	0	0.0
Did Not Use	0	0.0		Did Not Use	0	0.0

Even reshowing the broadcasts rated well with the teachers, as Table 26 shows; only one thought that using the VCR to reshow a broadcast had little educational value.

Table 26. Teacher Rating of Reshowing the Broadcasts

	Educational Value			How Much Students Liked	
	Number	Percent		Number	Percent
Liked a Lot	89	86.4	Great Value	90	88.2
Liked Somewhat	11	10.7	Some Value	9	8.8
Did Not Like	1	1.0	Little Value	1	1.0
Did Not Use	2	1.9	Did Not Use	2	2.0

Comments from teachers about the broadcasts in the end of year teacher survey all substantiate their high regard:

> "The program turned the students and me on! The children forgot that it was 'only a story' and became personally involved with the characters at THE HOUSE. In addition to the above, I believe it improved the children's relationships with each other as they became more sensitive to the feelings of others."

> "Students love the TV program! They seemed to lose motivation to respond to fax invitations."

> "I related a lot of our work to the themes and broadcasts... Jannelle was a great model, as well Katy & Miguel."

> "GALAXY has brought new ideas and activities to my classroom this year. I've been just as excited as the students to view the broadcasts, discuss the problems, and predict outcomes."

> "I can say that students look forward to the broadcasts, the characters are real to them, they get involved with the problems, and transfer what they have learned in other subjects to GALAXY."

> "The broadcasts and themes were well received, and looked forward to, by all my students. The enthusiasm for activities varied."

Student comments

Students at the case study sites were clearly enraptured by the broadcasts, as seen in Table 27. Part of the interview process involved playing "red light-yellow light-green light." Students were given three different colored circles on a stick to hold up as an indication of how they felt about different GALAXY components. Nearly all the

students interviewed (98.8%) awarded the broadcasts their green light signal ("Way to Go, GALAXY"). They were somewhat less enthusiastic about writing about the problems at THE HOUSE. While many students awarded GALAXY a green light on this aspect of the broadcasts, several students selected the red light ("Stop GALAXY") and the yellow light ("It's okay GALAXY") primarily because of frustration due to technical fax problems and secondarily because of difficulty with writing. Nevertheless, most students were excited to see their work and the work of their friends on THE HOUSE and perceived their faxes as being written for a real audience (i.e., the various characters in THE HOUSE).

Table 27. Student Ratings of THE HOUSE

	Green %	Green #	Yellow %	Yellow #	Red %	Red #
The Shows from THE HOUSE (N=81)	98.8	80	0.0	0	1.2	1
Writing about the problems at THE HOUSE (N=79)	50.6	40	36.7	29	12.7	10

Students were asked to rate the various parts of the broadcast. As seen in Table 28, the two most highly regarded features of the broadcasts were Mira's stories (88.0% green lights) and Carl's Cool Carl Comics (90.7% green lights). The feature that earned the highest "disapproval rating" was Mary Alice's stories (26.6% red lights).

Table 28. Student Ratings of Parts of the Show

	Green %	Green #	Yellow %	Yellow #	Red %	Red #
House rap	66.7	50	20.0	15	13.3	10
Simon's rap	53.3	40	36.0	27	10.7	8
The Dramas at THE HOUSE	53.3	40	36.0	27	10.7	8
Mary Alice's Stories	30.7	23	42.7	32	26.6	20
Mira's stories	88.0	66	8.0	6	4.0	3
Carl's "Cool Carl Comics"	90.7	68	9.3	7	0.0	0
Faxes being read on the show	77.3	58	16.0	12	6.7	5

Students at the case study sites were so taken with the broadcasts that they cited what they had learned from them when FWL researchers asked about the most important thing they had learned during GALAXY:

"I learned from THE HOUSE that sometimes I was similar to Carl and I haven't faced all my problems yet like Carl—so I learned a lot about myself."

"What I learned when Joey and Carl read Jannelle's diary and invaded her privacy was how you need to forgive your friends. Listen to yourself, and don't be hard on others because they did something bad to you. Give friends another chance."

"All the time you have a problem, you should tell them and ask for advice. I don't like to tell about my problems, and tell people to "bug off." But then I don't have help. If you tell people, then you get lots of suggestions. All the characters at THE HOUSE had problems and we helped solve some of them."

"I learned from the shows that other kids have problems - once everyone forgot my birthday—and you can learn about things you don't know and can relate to the kids. I learned to respect others."

Improving broadcast schedule and instructional use

While the broadcasts were highly successful, some technical and instructional areas for improvement have been identified. One technical problem was that some teachers were confused by the broadcast schedule. In addition, most teachers found the two day broadcasting cycle for each show to be too short, given the complexity of school's calendars.

FWL researchers observed at the case study sites that broadcasts were not always used as intended or to their best advantage. In some classrooms the broadcasts were overemphasized to the exclusion of other elements of GALAXY. In addition, often there was little or no debriefing of the broadcast prior to beginning other GALAXY activities. It was also noted that the Spanish broadcasts tended to be used for review purposes with the Spanish-speaking students rather than for the initial showing.

Some teachers made suggestions on their end of year surveys for small changes to the broadcasts:

> *"I'd like the characters on THE HOUSE to speak a little slower (Miguel and Jannelle)."*

> *"...we are focusing on writing correctly. It would help if during the broadcasts, the students used great correct grammar, punctuation, spelling, and capitalization."*

> *"Put the words to the raps on the screen for all broadcasts."*

> *"I would have liked to have seen the TV programs in advance so that I could coordinate the activities better for my group."*

These suggested changes are all relatively minor and reflect the fact that teachers are really thinking about how they can use the broadcasts in their instruction.

Summary

Like the themes which they illustrate, the broadcasts resonate well with teachers and students, and they are a powerful way of grabbing students' attention. FWL researchers encountered no negative comments at all about the content of the broadcasts.

Some changes of a technical nature could be made by GALAXY to improve teachers' use of the broadcasts. (1) Simplify the broadcast schedule and timing to reduce teacher confusion and increase teacher ease in showing a live broadcast. (2) Revise the schedule so that each broadcast is shown for at least three days. (3) If possible, program an automatic taping of the broadcasts at each site.

Several small changes in the activity guide would enhance instructional use of the broadcasts: (1) Provide teachers in the activity guide with a set of two or three suggestions for follow-up questions for each broadcast. (2) Provide teachers of Spanish-speaking students with assistance in using the Spanish version of the broadcast more effectively in class (e.g., modeling through videotapes and suggesting ideas in the activity guide).

Student Activities and Teacher Resource Materials

Teachers at the case study schools assigned great value to the GALAXY activity guide, giving it high marks for its ease of use and engaging and motivating activities. Classroom visits revealed that the activities helped teachers and students meet many of the important GALAXY goals. For example, the activities appeared to meet the needs of students of varying ability levels. Teachers selected activities that were most appropriate for their students and selected activities that incorporated a variety of instructional modalities (e.g., art, drama and role play, listening, writing, reading).

Teachers, on the whole, demonstrated an ease in adapting the activities to their own particular needs, teaching styles, and interests. For example, while some teachers emphasized activities that focused on writing performance, others used those activities that provided students with opportunities to engage in activities that encouraged the use of critical analysis skills (e.g., problem solving, comparing, contrasting, predicting). Many of the activities achieved their intended outcome in providing students with the opportunity to build on personal experience and prior knowledge, to engage in dialogue with their peers, and to express a point of view.

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Table 29. Teacher Rating of the GALAXY Activities

Educational Value

	Number	Percent
Great Value	89	87.3
Some Value	12	11.8
Little Value	1	1.0

How Much Students Liked

	Number	Percent
Liked a Lot	79	76.7
Liked Somewhat	24	23.3
Did Not Like	0	0.0

Usefulness

	Number	Percent
Very Useful	96	94.1
Somewhat Useful	5	4.9
Not Very Useful	1	1.0

The end of year teacher survey confirmed that the GALAXY activities were really popular with the vast majority of the teachers. The data in Table 29 shows that 87% rated them as having great educational value, and 77% thought their students liked the activities a lot. The GALAXY lesson plans/activities that appeared among the teacher resource materials were considered essential by the teachers at the case study schools, and the teachers surveyed concurred in this assessment: Ninety-six of the 102 teachers (94%) rated the suggested activities as very useful.

Table 30. Percent of Approximately 100 Teachers Rating the GALAXY Teacher Resource Materials

Resource Materials	Rating of the Usefulness in Helping You to Implement GALAXY With Your Students			
	Very Useful	Somewhat Useful	Not Very Useful	Did Not Use
Show synopses	84.0	15.0	1.0	1.0
List of critical issues	82.2	17.8	0.0	1.0
Literacy strategies and demonstrations	86.1	13.9	0.0	0.0
Literacy references	76.5	21.4	2.0	0.9
Written copy of the raps	65.7	31.3	3.0	2.0
Theme bibliographies	75.2	23.8	1.0	0.0
Teacher Resource Book	87.5	11.5	1.0	0.9
Literacy Activities Handbook	83.5	16.5	0.0	0.9

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As Table 30 above indicates, all of the elements of the teacher materials rated very highly with the GALAXY teachers, especially the Teacher Resource Book and the literacy strategies and demonstrations.

Teacher open-ended comments

On the end of year teacher survey, many of the GALAXY teachers commented on how important the suggested activities and the Teacher Resource Materials had been to them:

> *"The bibliography was fantastic. I loved the teaching activities which promoted higher-level thinking skills."*

> *"The Literacy Guide has really helped me in areas that I was hesitant or unsure about. The biggest problem for me has been the hectic pace trying to fit in all the fun and wonderful activities in a two week time span."*

> *"I have been given creative, usable activities that help reach my wide range of learners. "*

> *"The many activities your materials have provided and literature made available have enhanced my delivery—I love your activities!"*

> *"I tried many new ideas that I have read about in the Literacy Activity Handbook and the theme units. What great ideas! I think GALAXY made my teaching more interesting and meaningful."*

> *"I wanted to implement a literature-based reading program into my classroom but I felt really tied to the basal. Because of GALAXY we used the basal for only GALAXY activities (because it included stories from the bibliography). I also have enjoyed the writings activities with my students and I know my students have enjoyed them much more than classes from previous years."*

> *"GALAXY gave me motivation and enthusiasm as I looked forward to doing the GALAXY activities and using the equipment."*

> *"Instead of inventing new and cute activities, these are already planned out. I just have to prepare and teach them. This frees my time up considerably."*

Summary

It is hard to imagine a teacher's guide and list of suggested student activities that would be more successful than GALAXY's. There are several other goals of GALAXY instruction that would benefit from further emphasis in the teacher resource materials: They include a discussion of providing students with sufficient choice about what and how they learn and with opportunities to demonstrate their unique strengths and attributes as related to cultural heritage. Additionally, since very few of the activities

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explicitly emphasize the use of the various GALAXY technologies (e.g., the fax, the hoot 'n holler, and the computer), new activities making use of these technologies for communicating beyond the classroom should be incorporated into the teacher's guide.

Small group instruction

Many of the GALAXY activities encourage the use of small groups for instructional purposes. As Table 31 below shows, all but one of the teachers who answered the end of year survey thought that GALAXY helped students to work productively in groups. Similarly, doing "a better job of working with their peers to solve problems" was rated third highest in importance by the teachers from a list of thirteen behaviors. More than 80% of the teachers, as Table 31 shows, thought that most or some of their students reasoned about issues better with their peers. Students' working together had a positive effect on their interaction with their classmates.

Table 31. Percent of Teachers Rating GALAXY Small Group Instruction Effects on Student Behavior

How well does GALAXY help students to:	Very Well	Somewhat Well	Not Very Well	Not at All
Work productively in collaborative groups	57.4	41.6	1.0	0.0

Since GALAXY began, my students:	True for Most	True For Some	True for a Few	Not True for Any
Do a better job of working with their peers to solve problems	35.9	47.6	14.6	1.9
Reason about issues with their peers	38.8	41.7	18.4	1.0

Several of the GALAXY teachers at the case study sites demonstrated excellent skill at using small groups. However, repeated observations of GALAXY classrooms indicate that those teachers who struggled with small group instruction from the outset of the program continued to experience difficulty throughout. In fact, some of these teachers found ways to adapt the activities so that they could be used for whole class instruction. The primary problems with small group instruction involved student confusion about role and task. This confusion would inevitably require the teacher to spend more time on classroom management issues than on instruction. Students in these classes recognized the problem and were able to voice their frustration when asked their opinion. On the other hand, in those classrooms where small group instruction was successful, students were able to articulate their appreciation about learning with and from their peers.

On the end of year survey, teachers commented on the success of the cooperative groups and on the collateral effects they had observed among their students:

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"The debates and other cooperative activities were superb for strengthening analytical, social, and psychological development in students."

"They work cooperatively very well and enjoy the diverse cultures in the room."

"The students enjoyed coming to my classroom for the cooperative GALAXY groups."

"...the cooperative learning groups worked well and I plan to give my students many opportunities to share ideas orally in groups and for the whole class next year to develop some of the necessary skills to become good readers and writers."

"GALAXY helped the students work cooperatively which gave me time to focus on those students who were having special problems. Language Arts took on a whole new meaning and look. Awesome!!"

"GALAXY has helped or affected my teaching by enabling me to be more tolerant of noise when the students are working together to solve problems. Additionally, my students are working more to help each other and to solve problems in all subject areas."

"I am more inclined to use cooperative learning and to encourage children to interact with each other. I have thoroughly enjoyed this challenge and hope that the Language Arts focus will be extended."

"The cooperative groups worked excellently. Activities weren't even looked upon as reading/writing activities. I found myself looking forward to GALAXY classroom days."

Some students who were interviewed at the case study sites singled out the group experiences as "the most important thing they had learned from GALAXY."

"Learning is fun and it's not boring. I learned how to work in groups and cooperate and take turns, that's all. And I learned how to write stories."

"I learned how to work in groups. I used to not like working in groups. They kind of slow me down. Now I learned to get some of their ideas."

Summary

GALAXY small group instruction was successful for most classrooms, but some teachers, particularly those who had not used cooperative groups before, experienced some difficulty. Two recommendations regarding small group instruction are proposed. The first is to provide teachers with additional staff development support in facilitating small group experiences. The other is to provide teachers with additional alternative activities that could be taught in either small groups or large groups.

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GALAXY Literature

"I have learned reading the books has worked. My students have enjoyed the stories and we have had many wonderful discussions from the stories."

—comment from GALAXY teacher

High quality children's literature was an important component of the GALAXY program. The literature was selected to relate to the seven GALAXY themes, while providing a choice for differing levels of difficulty and teacher preference. During the GALAXY demonstration phase, six books of the teacher's choice were provided for each theme—forty-two for the entire cycle.

The objective for including the literature was to develop literacy and enhance self-esteem by helping students understand and debate opposing viewpoints, express their personal strengths, and analyze how the books might relate to their own lives. Briefly, GALAXY wanted to bring high quality children's literature into the classroom, to integrate the GALAXY themes and children's literature, and to engage students in reading, thinking about, and discussing the themes that underlie the curriculum.

Teacher reflections

The literature component of GALAXY received high marks from both teachers and students at the case study schools. Teachers greatly appreciated the way the books complemented the GALAXY themes and their outstanding quality. They are being used as intended to engage students in reading about and discussing the themes that underlie the curriculum. Demonstration phase teachers have expressed an interest in having more GALAXY books than currently allowed, especially those that are read by Mira on the broadcast. Several felt that a single book could be used only as a "read aloud." Others found creative ways to use one book for instruction (e.g., small group read-alouds with students reading to each other). Bilingual teachers have noted that they prefer literature that is not a translation from English. Apparently, the translation process elevates the reading level of the text.

Table 32. Teacher Rating of the GALAXY Literature Books

Educational Value			How Much Students Liked		
	Number	Percent		Number	Percent
Great Value	94	91.3	Liked a Lot	94	90.4
Some Value	8	7.8	Liked Somewhat	10	9.6
Little Value	1	1.0	Did Not Like	0	0.0
Did Not Use	0	0.0	Did Not Use	0	0.0

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Table 32 confirms the impression from the case study schools: over 90Percent of the teachers thought that the literature had great educational value and that their students liked the books a lot.

Teacher open-ended comments

On the end of year teacher survey, teachers mentioned the GALAXY literature and how much they and their students enjoyed the reading:

> *"The literature selections are great."*

> *"As a teacher, the literature component was impressive. I used more literature in my lessons on a regular basis."*

> *"The literature books are by far the best selection of multicultural stories that I have ever read to my classroom."*

Student comments

Students at the case study sites were asked several questions about 'he literature component. First, they were asked to rate two aspects of the program; how they liked reading the books and stories and how they liked their teacher reading GALAXY books aloud. As seen in Table 33 the majority of students (83.8%) greatly enjoyed the books. Those few who gave this component a yellow light did so primarily because they thought some of the books were "too easy." Students who were less enthused about having the books read aloud to them by their teachers were critical of the style and expression their teacher used.

Table 33. Student Ratings of GALAXY Literature

	Green %	Green #				
Reading the GALAXY books and stories (n=80)	83.8	67	16.2	13	0.0	0
Your teacher reading GALAXY books to you (n=49)	72.0	59	19.5	16	8.5	7

Secondly, they were asked to select their favorite GALAXY literature and to explain why they picked that book. They selected books easily, and with great excitement, and were often challenged by selecting their one favorite book. They loved having the opportunity to talk about these books. Their comments show that they were able to make connections between the GALAXY themes and the literature. In addition, students offered comments that show they appreciated how books can help them deal with everyday problems as well as be sensitive to their personal needs and interests.

They offered the following reasons for a favorite GALAXY book that demonstrate the kind of connections students were able to make between the themes and the literature:

Faithful Elephants—"*It made me think about things, like how unfair it is for animals and how lucky we are to be humans.*"

Rag Coat—"*The book was about people needing people. When she wore the coat to school, everyone teased her but she liked the coat because the material came from everyone.*"

One Foot, Now the Other—"*First the grandpa taught the grandson how to walk and then when the grandpa forgot how, the grandson taught him. People need people and nothing else. We'd be lonely without people.*"

Big Orange Splot—"*Because Mr. Plumbean was different from the others, he was true to himself and did not let others bug him. He was brave and he was a leader. He encouraged people to follow their dreams.*"

Big Al—"*At first he seemed ugly and mean—but they just couldn't see the other side of him—his inside was nice.*"

"*I liked how he saved all the little fishes. He was a hero!*"

Other reasons for favorite books had to do with the books' way of addressing an issue or topic of special importance to them. These books and reasons include:

Brave Irene—"*I respect bravery. She wasn't a he-man, but she was really brave.*"

Angel Child, Dragon Child—"*I like to learn about history and things about different races. I like to read books about prejudice because I'm into peace and I like to find new ways to help make peace.*"

The Pain and the Great One—"*I have a brother. He's little and I'm big. He gets treated differently. It helps you think of things you can do with a brother.*"

The Gold Cadillac—"*It's a warning book—about where not to go when you are Black.*"

La Calles es libre—"*I liked how the pictures looked like my home in Puerto Rico. It reminds me of my cousins. I was happy there.*"

The Leaves of October—"*It makes me think about people who are homeless and I'd like to help them and they are nice people, not crazy people.*"

Summary

Both teachers and students were entranced by the GALAXY literature books, and they all saw clear connections to the GALAXY themes. As GALAXY moves beyond the

demonstration phase, some planning might be done to facilitate schools' access to and ordering of the GALAXY literature books. In addition, the teacher's guide might include additional ideas on how to use a single book in a classroom.

THE SECOND STORY

Although THE SECOND STORY was received with mixed reactions during the first part of the language arts cycle, by the time the last copy of the magazine was distributed both teachers and students seemed be more comfortable with the publication and had found ways to use it. Many of the activities appeared to have been tried both in school and at home. Several students expressed their appreciation for having their own "piece of GALAXY" to take home. Student ratings of THE SECOND STORY were largely favorable. Most (69.1%) gave the magazine a green light, 24.7% gave a yellow light and 6.2% gave a red light.

Teacher comments

Teachers at the case study sites reported that they believed the magazine had encouraged their students to read, although they also reported that the magazine format and "busy-ness" contributed to making reading more difficult. In addition, there was considerable uncertainty among teachers regarding how to use the magazine as a tool for in-class instruction, for involving parents, and for homework assignments. These comments were generally confirmed by data from the end of year survey, as shown in Table 34.

Table 34. Teacher Rating of THE SECOND STORY

Educational Value				How Much Students Liked		
	Number	Percent			Number	Percent
Great Value	60	58.8		Liked a Lot	67	66.3
Some Value	39	38.2		Liked Somewhat	34	33.7
Little Value	2	2.0		Did Not Like	0	0.0
Did Not Use	1	1.0		Did Not Use	0	0.0

One teacher's comments suggest some of the problems with the student magazine: "THE SECOND STORY: the kids read them, some discussion, but we couldn't fax, and no one looked up the book references. We would not read them all together because of two languages."

Summary

THE SECOND STORY has the potential for further encouraging reading among GALAXY students. But data from teachers in the demonstration phase suggest that GALAXY should consider making The Second Story an optional purchase component of GALAXY. In addition, GALAXY should reconsider the purpose and use of the magazine and should perhaps move to a less "busy" format.

THE MAX

Ratings of the student publication, THE MAX, were largely favorable among students at the case study schools. Most (65.3%) gave THE MAX a green light, with yellow (24.5%) and red (10.2%) far behind. Generally they were pleased to see their work and the work of their friends in this publication. However, both students and teachers were often disappointed when their work was not included in THE MAX despite many submissions. In addition, teachers seemed uncertain about how to use the one copy they received in their fax machine with the entire class. Generally it was posted on a bulletin board or put in a special folder. Teachers had developed few strategies for using THE MAX for instruction.

Table 35. Teacher Rating of THE MAX

Educational Value	Number	Percent
Great Value	41	41.8
Some Value	43	43.9
Little Value	7	7.2
Did Not Use	7	7.2

How Much Students Liked	Number	Percent
Liked a Lot	48	49.5
Liked Somewhat	40	41.2
Did Not Like	2	2.1
Did Not Use	7	7.2

The end of year survey shows that teachers were not nearly as excited about THE MAX as they were about other components of GALAXY. As Table 33 above shows, over 80% of the teachers thought that it had great or some value. And an even higher margin thought that their students liked it. However, THE MAX did not score as well as other program components such as the broadcasts, which 95% of the teachers thought had great educational value. When asked separately about faxing to THE MAX, teachers were more positive about their students' attitudes, as indicated in Table 36.

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Table 36. Teacher Rating of Student Enthusiasm About THE MAX (PERCENT)

Activity	Very Enthusiastic	Somewhat Enthusiastic	Not Enthusiastic	Did Not Do
Faxing to THE MAX	64.0	26.0	3.0	7.0
Receiving THE MAX	52.0	34.3	10.8	2.9

Teacher Comments

Teacher comments on THE MAX centered on the difficulty some of them had in knowing whether their students' faxes were getting through and the disappointment that students suffered when their names and/or work did not appear in THE MAX:

> "Apparently our faxes didn't make THE MAX. Students lost interest. We faxed quite often. I don't know what happened."

> "Received only two of THE MAX—called and reported several times."

> "Since we were not sending faxes successfully, the issues of THE MAX lost some of their appeal. However, when we had our first author published in issue 6A the excitement returned."

> "Need a way to recognize all faxes sent to THE HOUSE or THE MAX. Students lost some interest when they did not see their work printed or used."

> "THE MAX needs to include more student writings, at least one from each school for every issue."

Summary

Student interest is piqued when they see their own work or the work of their friends and acquaintances in THE MAX. However, this is counterbalanced, to some extent, by the number of classrooms that tried to fax to THE MAX, only to be disappointed when their work did not appear. They were left in a quandary about whether their faxes had been received, and some students were "turned-off" to faxing by the number of unsuccessful attempts. Given this uneven experience with THE MAX, GALAXY might consider the elimination of this component. If it is retained, there should be some mechanism to guarantee better representation of all students, larger print, and a less cluttered appearance.

Staff Development

The Institutes won extremely high praise from teachers, as Table 37 shows. They appreciated 'he quality and value of the workshops and presentations. They felt that the Institutes contributed greatly to their ability to teach GALAXY. However, teachers at the case study sites expressed the belief that they would have benefited from additional ongoing support and reinforcement throughout the cycle for what they had

learned at the Institutes. In addition, most teachers agreed that they would have appreciated having more hands-on experience with the various hardware components and having technology sessions taught by other teachers. They also noted that it war especially difficult in classrooms of at-risk students for teachers to be away from the classroom in order to attend the Institutes. They provided vivid descriptions of the management problems they faced during and after their absence.

Table 37. Teacher Rating of Usefulness of Language Arts Institutes (Percent)

Usefulness of the following in helping you to Implement GALAXY with your students	Very Useful	Somewhat Useful	Not Very Useful	Did Not Use
Los Angeles Institute	84.2	8.4	2.1	5.3
Atlanta Institute	81.3	11.5	0.0	7.3

On the end of year teacher survey, teachers expressed their strong feelings that the teacher Institutes had been valuable for them:

"I feel that the Atlanta staff development was the best I've every attended."

"Especially helpful to meet and re-meet teachers and staff in the GALAXY Program. Sharing thoughts and ideas with other educators was a strong part for me!"

"Training was superb, especially concerning literacy strategies. The scope of specific, as well as general open-ended approaches, was developed and presented."

"The LA Institute was wonderful but Atlanta was more meaningful because we already had implemented the program and more direct questions and the sharing with the teachers was very practical as well as useful. But—both institutes provided very valuabl. ˜taff development."

"The Institutes and resource materials have aided me in teaching a more holistic approach in the language arts area."

Summary

The GALAXY Language Arts Institutes are so successful that they should continue as a regular part of GALAXY, perhaps on a regional basis. GALAXY might want to tape outstanding Institute presentations for broadcast during the year. Additionally, the Institutes should provide time for GALAXY teams (e.g., principals, teachers, resource teachers) to engage in joint planning.

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IX. Conclusion

The GALAXY Classroom Project was developed as a nationwide reform effort to infuse new curricula into schools, to spark the interest of teachers and students in learning, and to make a significant difference in the educational lives of students who traditionally have been labeled "at-risk."

The first phase of the GALAXY demonstration, Language Arts for Grades 3-5, achieved a number of unequivocal successes. It brought to a cross-section of America's economically disadvantaged students a classroom experience that connects reading and writing to their own concerns, knowledge, and experiences, and that respects their substantial intellectual capabilities.

GALAXY reached its diverse multicultural learners in a way that generated extraordinary student enthusiasm. That enthusiasm was shared by teachers, who in numerous cases reported that the experience had brought new life to their professional work. GALAXY has had an impact beyond language arts; it has changed the way many teachers view the capabilities of their students. GALAXY's unique interactive component, the use of the fax machine, fueled that enthusiasm, despite technical problems.

The changes that GALAXY generated had a positive impact on student learning; GALAXY students achieved statistically significant greater gains on both Vocabulary and Reading Comprehension measures when compared with the gains of students in similar classrooms. Writing measures for GALAXY students also showed a statistically significant pattern of gain. As experience develops further in subsequent iterations of GALAXY, further positive impact should be seen.

The evaluation team can point to a number of factors that makes GALAXY work:

- The integrated thematic curriculum links broadcasts, literature, instructional activities, and the use of the fax. The themes have personal relevance to children's lives and provide a context for reading and writing, a common frame of reference for teachers and students.

- Access to the technology in their own classrooms — TVs for viewing GALAXY broadcasts, VCRs for reviewing shows, fax machines for communicating with other students and with the producers — provides students with opportunities to write for real audiences and to become part of a nationwide community of learners. Further, they gain positive reinforcement for using technology -- a good experience for many of the students and their teachers.

- A key component is the staff development for the teachers in how to use the curriculum, its literacy strategies, and its activities and how to integrate technology into the curriculum

Perhaps the impact of GALAXY can best be summed up in the words of a GALAXY student from Orangeburg, SC: *"You can be smart, but it [GALAXY] can help you get smarter."*

APPENDICES

Appendix A. Technical Appendix

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NCE Scores In General

The Normal Curve Equivalent, or NCE, is a kind of standard score that is designed to be similar to percentile scores. As a standard score, it is approximately Normally distributed. It is set so that, for the reference group (in this case the sample used for establishing norms), it has a mean of 50 and a standard deviation of about 21.06. The standard deviation is actually set to that an NCE of 1 corresponds to a percentile of 1 and NCE of 99 corresponds so a percentile of 99. By convention, the NCE scale is truncated at 1 and 99, even though as a standard score it has no theoretical upper or lower limits.

As a standard score, it is reasonable to manipulate NCE scores by addition, subtraction, and calculating an average. It is not appropriate to manipulate percentiles in this way. That is because a change from a percentile of 5 to 10 represents a much larger change than a change from 40 to 45, say. Near the middle of the distribution, a small change in test score allows you to move past many others. In contrast, near the ends of the distribution, a large change in test score is needed to move past the same number of individuals.

NCE Scores on CAT/5 Tests

The NCE scores available from CTB for the CAT/5 tests administered are based on a national norming sample from a few years ago. Even assuming the national norming sample was representative of the target national population, the population has undoubtedly changed since the norming sample was tested. To the extent the nature of those changes are known, they should be considered in interpreting the NCEs.

The students tested have an average NCE around 40, which corresponds to a percentile of around 32. This means that, as expected, the students tested tend to score lower than the national norming sample.

The national norming sample is cross-sectional. That means that, for example, the third graders and fourth graders were tested the same year. There is no assurance that the third graders would, as a group, have the same distribution of scores the following year (when they are in fourth grade) as the fourth graders who were actually tested. In fact, if test scores are steadily increasing or steadily decreasing over time, the cross-sectional norms can be misleading when considered longitudinally.

Consider the following simplified example. Suppose third graders in the national norming sample get an average score of 350 and fourth graders an average score of 400.

Suppose further that test scores in general are declining 10 points per year. Then the next year the third graders in the national norming sample, who would now be in the fourth grade, would be expected to average 390 (not 400). Furthermore, even if it is known that the students will average 390 that does not say a great deal about the distribution of gain scores. It is unlikely in the extreme that every student will increase by 40 points. No doubt many students will increase by substantially less or even decline (due largely to measurement error), and others will increase by substantially more. The only way to know the distribution of gain scores would be to have a longitudinal norming study. Unfortunately, test publishers rarely have the time and resources to perform a longitudinal norming study.

Instead of longitudinal norming studies, users of norm-referenced tests are usually forced to rely on assumptions. Usually it is assumed that the norming sample, although cross-sectional, is representative of the distribution to be expected among the tested students. Furthermore, it is assumed that the growth among students is symmetric about its mean, so that half the students grow more than the midpoint of the norms and half grow less. Unfortunately, even with these assumptions, it is still not possible to calculate the average growth for a group of tested students unless their score distribution is centered at the same place as the national norming sample.

For students who score lower on average than the national norming sample, empirical studies have shown that they tend to grow less than indicated by the national norms. Unfortunately, we don't know how much less. Thus the expected average gain for the students in this study lies between a zero gain in scale score (a drop in NCE or percentile) and a zero gain in NCE or percentile (an increase in scale score).

Scale Scores

The scale scores reported for the CAT/5 are designed to be an equal-interval scale across the grades and abilities of elementary and secondary education. That is, a 10 point increase from 300 to 310 is designed to be comparable to a 10 point increase from 800 to 810. Furthermore, the scale scores are standard scores, based on the Normal distribution, and therefore can be manipulated by addition, subtraction, and calculating averages.

Floor and Ceiling Effects

If a test is much too difficult or much too easy for a student, the resulting score is questionable. For each test, there is a lowest obtainable scale score (LOSS) and a highest obtainable scale score (HOSS). Students who score only about as well as would be expected by chance would be assigned scale scores at or near the LOSS, the "floor" for scale scores for the test and level. Given a more appropriate level of the test (an easier one), those students might get about the same scores or might get substantially lower scores. They are unlikely to get substantially higher scores. Similarly, students who get all the items correct would be assigned the "ceiling" scale score, the HOSS. If these

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high-scoring students were given a more appropriate (harder) test, e could estimate their true scale score much better.

Standard Error of Measurement

Associated with any test is measurement error. This represents the fact that in hypothetical repeated administrations of the same test to the same individual, the resulting score will not be exactly equal every time but tend to fluctuate around the individual's "true score." The "true score" is nothing more or less than the (theoretical) mean score that would be obtained in repeated administrations. In practice, one cannot expect to estimate the score by repeated administration because the individual would remember items if the administrations were close in time and because the individual might have learned things if the administrations were not very close in time.

There are various ways to estimate the measurement error, however, and CTB provides an estimate of the Standard Error of Measurement (SEM) associated with the scale score for each subtest. The SEM varies substantially according to the actual test score. Students scoring near the middle of the test range (getting around half the items correct) will tend to have the smallest estimated SEM. Students assigned the lowest or highest obtainable scale scores will have the largest estimated SEM -- a value often many times larger than the smallest SEMs. For the CAT/5 tests, the estimated SEMs are quite near their minimum value for a wide range of test scores but inevitably increase dramatically as the ceiling or, especially, the floor of the test is approached.

There are more scale scores associated with large SEM at the low end of the scale because of guessing. On a 25-item multiple-choice test with five choices for each item, a student attempting all items can be expected to get about 5 correct purely by chance. However, it is quite possible that students guessing randomly on each item might get 6 or 7 or even 8 or more items correct purely by chance. On the other hand, they might get only 2 or 3 correct by chance and other items that were correct might reflect true knowledge. The calculation of the SEM takes into account the likelihood of obtaining the resulting score purely by chance and so is noticeably large for scale scores associated with answers below or near the guessing threshold. In contrast, only the top few scores have highly inflated SEMs. The highest score (HOSS) has a large standard error of measurement because it is hard to estimate how much higher the scale score would have been with a harder test. Similarly, an individual getting only one or two items incorrect might actually know the correct answer (and merely have mismarked the test) or might be able to do many similar questions but have misinterpreted the item or otherwise had unusual difficulty with it. In other words, the very large SEMs at the high end of the score distribution tend to be associated with "careless errors" or no errors at all.

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Gain Scores

We performed our analyses with gain scores, the difference between the post-test score and the pre-test score. In the case of two test scores, as we have here, the gain score analysis is equivalent to a repeated-measures Analysis of Variance and is also equivalent to an analysis of individual growth curves. Both of these alternative analyses are appropriate when three or more time points are available. There was a time when some authors argued against analyzing gain scores, but their arguments have been convincingly answered in the more recent literature. In particular, the analysis of post-test score using the pre-test score as a covariate has been shown to be fraught with problems.

Although the reliability of the gain score is low relative to the reliability of the pre-test and of the post-test, that is more due to the fact that the actual differences in growth among individuals (true variance) tend to be small when the pre-test and post-test are only a few months apart. Note that the reliability, defined as the true variance divided by the sum of the true variance and the measurement error variance, approaches zero as the time between the pre-test and the post-test approaches zero because the true variance also approaches zero. For current purposes, suffice it to say that the gain score is an unbiased estimate of the growth between the two tests and that it is as reliable as possible.

The "Reading Total" Score

The "Reading Total" scale score is simply the average of the Vocabulary scale score and the Reading Comprehension scale score. The standard error of measurement (SEM) for the Reading Total score is provided by CTB. It appears to be calculated as one would expect under the usual assumption of uncorrelated measurement error across subtests, namely as half the square root of the sum of squared SEMs. Thus if the SEM for Vocabulary were 10 and the SEM for Reading Comprehension were 8, their minimum values, the SEM for the Reading Total would be at its minimum value of 7 (half of the square root of 100+64, or about 13/2).

The SEM for the Gain Score

The SEM for the gain score is not reported by CTB, but can be estimated under the simplifying assumption of uncorrelated measurement errors between the pre-test and post-test. Under that assumption, the SEM for the gain score can be estimated as the square root of the sum of squared SEMs for the pre-test and the post-test. The minimum estimated values are given in the following table:

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Table A.1 Minimum Estimated SEM of Gain Scores

Test	Minimum SEM for Pre- or Post-test	Minimum SEM for Gain Score
Vocabulary	10	14.14
Reading Comprehension	8	11.31
Reading Total	7	9.90

This means that the gain score for an individual is at best known within a standard error of 10 or more.

Weighting Scores According to Estimated Variance

Scores with high standard error of measurement (SEM) are not estimated very precisely. This ancillary information needs to be considered in the analysis. One relatively crude approach would be to eliminate from the analysis any individuals with "unacceptably large" SEMs. This approach creates several difficulties. One is that the cutoff for elimination is necessarily arbitrary. Another is that individuals with acceptable SEM for one subtest but not the other either must be eliminated from both analyses (thereby eliminating perfectly good information) or the sample used for each subtest (and the Total Reading score) must be allowed to be different.

A better approach is to downweight the scores with high SEM. It can be shown that using weights inversely proportional to the variance of the score (the square of the SEM) results in optimal estimates (in the sense of Best Linear Unbiased Estimates). For convenience, the weights were defined relative to the minimum estimated variance. Thus individuals with estimated gain score SEM equal to the minimum for the test were assigned a weight of 1.0. Individuals with very high gain score SEM were assigned a very low weight.

Student-Level Analyses of Matched Classrooms

Many of the analyses comparing treatment to control were done for two distinct sets of students. The first set of students represent the most tightly matched groups of students and the second set represents the vast majority of students. The most tightly matched groups of students were the comparison classrooms in GALAXY schools and the corresponding GALAXY classrooms (in the same grade). There were 29 comparison classrooms in 22 school-grade combinations across 21 schools (one school had comparison classrooms in two grades). Each of these 22 school-grade combinations was matched with at least one GALAXY classroom at the same grade, for a total of 26 GALAXY classrooms. There were, in general, other GALAXY classrooms in the schools but they were at different grades. Thus a total of 55 classrooms in 21 schools were matched in 22 school-grade combinations.

The analysis of these matched classrooms was done at the student level. Logically, the difference between treatment and control was estimated for each of the 22 school-grade combinations and then the 22 estimates combined. If all of the school-grade combinations had included exactly the same number of GALAXY and comparison students with valid test scores (a completely balanced design), the difference between GALAXY and comparison would be the difference between the means for the two groups of students. Because the number of students varied somewhat from school to school, the actual estimate deviates somewhat from the simple mean. The estimated mean scores for the treatment and control students in unbalanced designs are sometimes called "least-squares means" or "estimated population means." We will usually term them estimated means to distinguish them from the simple sample means.

For the matched-classrooms analysis, it is appropriate to perform the analysis at the student level because each school-grade combination included in the analysis had both treatment and control students. That is, the treatment was crossed with the experimental unit (school-grade combination). This provides a relatively powerful analysis because the treatment effect is estimated after controlling for school and grade. On the other hand, many students had to be omitted from the analysis, including all the students from non-GALAXY comparison schools and all the students from GALAXY schools where there were no comparison classrooms.

Classroom-Level Analyses of Most Students

Besides the student-level analyses of students in the matched classrooms in the 21 schools, additional analyses were performed on the vast majority of classrooms. These analyses were performed at the classroom level. In other words, the difference between GALAXY and comparison was evaluated by comparing the gains among comparison classrooms as a group with the gains among GALAXY classrooms as a group. Where the distribution of gains among GALAXY classrooms was shifted compared to the distribution of gains among comparison classrooms by more than could be expected by chance, GALAXY gains were declared to be significantly greater than comparison gains. Note that these analyses include the matched classrooms in the 21 schools.

The analysis as described does not control for possible grade, school, or district (region of the country) effects. In fact the analyses checked for grade effects (and grade-by-treatment interactions) and found none. There were significant school and district effects, but the analyses did not control for them. The decision not to control for school and district effects was based on a series of analyses that considered the effect of controlling for school and district in the classroom-level analyses. Although there is substantial variation from school to school and district to district (region to region), the variability is only about twice as large as the class to class variability within schools. Because controlling for school would necessitate eliminating many classrooms, including all classrooms in non-GALAXY schools, statistical power to detect treatment differences was improved by not controlling for school effects. Similarly, even controlling only for district (region) would have meant eliminating those districts that had no comparison classrooms. The small increase in error variance (class to class

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variability) from ignoring school and district effects was more than offset by the increase in classrooms includible in the analysis and the simpler form of the analysis.

Students Included In The Analysis

We omitted students who had invalid CAT/5 tests, who took any test in Spanish (the SABE 2 or Writing Prompt or Performance Assessment), or who took the wrong level CAT/5 test. We also eliminated students who did not have both CAT/5 subtests.

Item Response Theory Scoring

The tests were scored using Item Response Theory (IRT) rather than simple number-correct raw scores. This scoring method takes into account the difficulty of an item when evaluating the effect on the score of a correct or incorrect answer. The effect is that the standard error of measurement is smaller with IRT scoring than with traditional number-correct scoring. That is, the resulting scale score is generally more accurate when using IRT scoring than when using number-correct scoring. One effect is that two individuals with the same number of correct items may have different scale scores.

Correlation Between Pre-test And Gain

The correlation between the pre-test score (initial status) and gain score (difference between post-test and pre-test) is of considerable theoretical interest. A positive correlation indicates that students who start higher tend to gain more ("the rich get richer"), while a negative correlation indicates that students who start lower tend to gain more ("the poor are catching up"). If the correlation is approximately zero, this means that the gains are not systematically related to initial status ("a rising tide lifts all boats").

Unfortunately, the sample correlation between the pretest and the gain score is not an unbiased estimate of the corresponding population correlation because of measurement error and the associated "regression to the mean" effect. The bias is such that the sample correlation tends to be negative when the true correlation is zero. The following simplified example illustrates this. Suppose that the true gain is the same for every individual and so the gain is unrelated to the initial status. Individuals who (by measurement error) have a relatively low pretest score will tend to have a higher post-test score (and greater gain). Similarly, individuals with a relatively high pre-test score because of measurement error will tend to have a lower post-test score. Both of these effects lead to a negative correlation between pre-test and gain score.

Given an estimate of the reliability of the test scores, however, it is possible to obtain an unbiased estimate of the population correlation between the pre-test and the gain score. From the CAT/5 Technical Bulletin 1 (June 1992, p. 49), we get the following values for reliability as measured by Kuder-Richardson Formula 20 (KR20):

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Table A.2 Reliability by Test and Grade for Pre-test/Post-test

	Grade		
	3	4	5
Vocabulary	.78	.78	.69
Reading Comprehension	.80	.79	.80
Reading Total	.87	.87	.84

Using V1 and R1 to denote the variance and reliability of the pretest and V2 and R2 the corresponding values for the posttest, and using C12 to denote the covariance between the pretest and posttest, the estimated reliability of the gain score, R12, is calculated as:

$$R12 = \frac{V1*R1 + V2*R2 - 2*C12}{V1 + V2 - 2*C12}$$

Choosing reliability values as indicated for the pre-test and post-test, we obtain the following reliabilities for the gain scores:

Table A.3 Reliability of Gain Score

	Reliability of Pre- and Post Test	Reliability of Gain Score
Vocabulary	.78	.046
Reading Comprehension	.80	.126
Reading Total	.87	.192

These low values are typical for gain scores over relatively short intervals of time (in this case, 17 weeks). They reflect the fact that the true variability between individuals in gain score over a short period of time is small relative to measurement error. As the time interval between tests is reduced to zero, the reliability of the gain score is also necessarily reduced to zero.

Having an estimate of the reliability of the gain scores and of the pretest score permits the calculation of a reliability-adjusted estimated correlation between the pre-test and gain:

Table A.4 Estimated Correlations Between Pre-test and Gain

	Sample Correlation	Estimated Reliability-Adjusted Correlation
Vocabulary	-.3315	-.0453
Reading Comprehension	-.2555	.0975
Reading Total	-.2156	.0216

The reliability-adjusted correlations between pre-test and gain are all very small and vary in sign. This implies that there is no measurable systematic relationship between pre-test score and gain score: test score improvements are approximately the same for all levels of initial status.

Reliability of Writing Prompts and Performance Assessments

The Writing Prompts (WP) and Performance Assessments (PA) were scored using a similar process. A scoring rubric was developed and "anchor" papers provided during training sessions for the readers. The WP scores ranged from 1 to 6 (with some indicated as unscorable) and the PA scores from 0 to 5. During the actual readings, papers were read in batches of the same test (WP1, WP2, or PA1 through PA4). A random sample of 10% of the tests were then scored by a second reader. If the two readers differed by more than oı ə point, they were then scored by the chief reader.

For the writing prompts, most of the scores were between 2 and 4, with only a handful of the scores at 6. The distribution of scores across the two writing prompts was as follows:

Table A.5 Distribution of Writing Prompt Scores

	#	%
Unscorable	123	2.1
Score 1	362	6.3
Score 2	1207	21.0
Score 3	2591	45.2
Score 4	1126	19.6
Score 5	291	5.1
Score 6	35	0.6
Total	5735	100.0

The distribution of scores across the four performance assessments had a similar shape:

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Table A.6 Distibution of Performance Assessment Scores

	#	%
Score 0	36	0.8
Score 1	413	8.6
Score 2	1450	30.3
Score 3	1977	41.3
Score 4	743	15.5
Score 5	166	3.5
Total	4785	100.0

The score assigned for analysis purpose was the median of the available scores. For the papers that were assigned two scores that differed by 1, the median is the average of the two scores, giving rise to scores that end in ".5" in the analysis. For the 51 papers where the two readers differed by more than one point, the median turned out to be the value assigned by the third reader (the chief reader) in all but one case. That is because the chief reader almost always agreed with one of the readers or assigned a score in between the two. In the one exceptional case, the first reader gave a score of 4, the second reader a score of 2, and the chief reader a score of 5. The median score, 4, was used for analysis.

An analysis of variance was performed to check for various possible influences on test scores. The readers were at one of two tables during the scoring, but no significant difference between the two tables was found. Also, no significant order effect was found (whether readers were tougher or easier on papers when they were being scored first or were part of the 10% rescoring sample). There were, however, significant differences among the 16 readers. The following estimated "reader effects" relative to the chief reader were obtained from the papers that were scored twice:

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Table A.7 Estimated Reader Effects for Writing Prompt and Performance Assessment Scores

Reader	Effect	t	P
120	-.629	-3.64	<.001
122	-.577	-3.57	<.001
114	-.319	-2.03	.043
127	-.298	-1.80	.073
113	-.228	-1.49	.140
121	-.219	-1.40	.160
125	-.121	-0.78	.440
112	-.113	-0.69	.490
116	-.096	-0.68	.500
115	-.089	-0.58	.560
123	-.072	-0.44	.660
124	-.057	-0.37	.710
111	.023	0.06	.950
126	.023	0.15	.880
110	.246	1.74	.082

It can be seen that most readers tend to give slightly lower scores than the chief reader. The two lowest-scoring readers assign significantly lower scores. The other readers give scores that are reasonably close to each other and to the chief reader. A synopsis of the reader effects might be as follows:

120, 122	Low about .5 points
114, 127	On the low side of normal range (.25 points?)
111,112,113, 115,116,121, 123,124,125,126	In the normal range
110	On the high side of normal range (.25 points?)

Although it would be possible to analyze the WP and PA after making adjustments based on this ANOVA, no such analyses were performed. The reader effects are fairly small and are unlikely to result in any significant biases in the analyses performed.

From the ANOVA and related analyses, it is possible to estimate the interjudge reliability of the WP and PA tests to be in the range .59 to .79. These are reasonable

interjudge reliabilities but unfortunately they serve only as an upper bound on the test-retest reliability that we need to use to calculate a reliability-adjusted estimate of the correlation between pre-test and gain.

Perhaps more instructive is to estimate the test-retest reliability that would produce a zero estimated correlation between pre-test and gain. That calculation yields reliability figures of .202 (for the gain from PA2 to PA3), .275 (for the gain from PA1 to PA4), and .303 (for the gain from WP1 to WP2). In other words, if the test-retest reliability is around .2 to .3 for these tests, then the estimated correlation between the pre-test and the gain is zero.

If the test-retest reliability of these tests is greater than the .2 to .3 range and approaches the interjudge reliability of .6 to .8, then the estimated correlation between pre-test and gain is increasingly negative.

In light of the relatively low correlation between pre-test and post-test (.22 for PA23, .33 for PA14, and .37 for WP12). it seems reasonable to conjecture that the test-retest reliability is fairly low for these tests. Moreover, a true negative correlation between pre-test and gain could be due in part to floor and ceiling effects in the restricted range of scores available. Accordingly, it seems unreasonable to reach any conclusions based on the possibly negative correlation between pre-test and gain for the PA and WP tests.

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APPENDIX B: PSYCHO-SOCIAL INSTRUMENT

Key: R=Reading, W=Writing, S=About School, SC=Harter's Scholastic Competence[1]

What I Am Like

For Teacher to Fill Out:
School: _____ Teacher: _____ Class: _____

For Student to Fill Out:
Student Name: _____
                     (first)   (last)

Age: _____ Birthdate: _____   Boy   Girl
                         month   day   year   (circle one)

Really True for me	Sort of True for me				Sort of True for me	Really True for me	
		Sample Sentences					
(a) ☐	☐	Some kids would rather play outdoors in their spare time	BUT	Other kids would rather watch TV.	☐	☐	
(b) ☐	☐	Some kids do very well at all kinds of sports	BUT	Other kids don't feel that they are very good when it comes to sports.	☐	☐	
1. **4**	**3**	Some kids like to read in their free time	BUT	Other kids would rather not read in their free time.	**2**	**1**	R
2. **4**	**3**	Some kids wish they could do more writing in school	BUT	Other kids wish they could spend less time writing in school.	**2**	**1**	W
3. **4**	**3**	Some kids feel that they are very good at their schoolwork	BUT	Other kids worry about whether they can do the schoolwork assigned to them.	**2**	**1**	SC
4. **1**	**2**	Some kids do not like the things they do in school	BUT	Other kids like the things they do in school.	**3**	**4**	S
5. **1**	**2**	Some kids feel that what they read in school is boring	BUT	Other kids enjoy what they read in school.	**3**	**4**	R
6. **1**	**2**	Some kids hate to change something they have written	BUT	Other kids like to change what they write.	**3**	**4**	W
7. **4**	**3**	Some kids feel that they are just as smart as other kids their age	BUT	Other kids aren't so sure and wonder if they are as smart.	**2**	**1**	SC
8. **4**	**3**	Some kids like the way they are taught to read	BUT	Other kids do not like the way they are taught to read.	**2**	**1**	R
9. **4**	**3**	Some kids feel they are good readers	BUT	Other kids feel they don't read very well.	**2**	**1**	R

[1]Thanks to Professor Susan Harter of the University of Denver for facilitating our use of elements from the *Self-Perception Profile for Children*, which she developed.

10.	**4**	**3**	Some kids feel they are good at writing about their ideas	*BUT*	Other kids wish they were better at writing about their ideas.	**2** **1**	W
11.	**1**	**2**	Some kids are pretty slow in finishing their schoolwork	*BUT*	Other kids can do their schoolwork quickly.	**3** **4**	SC
12.	**1**	**2**	Some kids are not so sure that they like going to school	*BUT*	Other kids like going to school.	**3** **4**	S
13.	**1**	**2**	Some kids don't like to talk about a good book they have read	*BUT*	Other kids like to tell their friends about a good book they enjoyed.	**3** **4**	R
14.	**1**	**2**	Some kids hate to write	*BUT*	Other kids feel that writing is fun.	**3** **4**	W
15.	**1**	**2**	Some kids often forget what they learn	*BUT*	Other kids remember things easily.	**3** **4**	SC
16.	**4**	**3**	Some kids feel they learn a lot in school	*BUT*	Other kids feel they don't learn very much in school.	**2** **1**	S
17.	**4**	**3**	Some kids feel that it is important to read well	*BUT*	Other kids feel that it is not important to read well.	**2** **1**	R
18.	**4**	**3**	Some kids are proud of the things they write in school	*BUT*	Other kids wish they could feel more proud about what they write.	**2** **1**	W
19.	**4**	**3**	Some kids do very well at their classwork	*BUT*	Other kids don't do well at their classwork.	**2** **1**	SC
20.	**1**	**2**	Some kids feel that it is not important to write well	*BUT*	Other kids feel it is important to write well.	**3** **4**	W
21.	**1**	**2**	Some kids have trouble figuring out the answers in school	*BUT*	Other kids can almost always figure out the answers.	**3** **4**	SC
22.	**1**	**2**	Some kids would like to do less reading in school	*BUT*	Other kids wish they could spend more time reading in school.	**3** **4**	R
23.	**1**	**2**	Some kids do not like the way they are taught to write	*BUT*	Other kids like the way they are taught to write.	**3** **4**	W

Directions To Teachers On Administration Of The Writing Prompt

IMPORTANT!! PLEASE REFRAIN FROM LOOKING AT THE DESCRIPTION OF THE WRITING ACTIVITY UNTIL THE TIME YOU ADMINISTER THE WRITING PROMPT. THANKS!

Note to Teachers: Students will be scored on their ability to write their ideas clearly and persuasively. They will *not* be scored on spelling or form.

Please proceed as follows:

- See that each student receives **one** copy of the "writing packet" and **one** piece of yellow blank paper. The yellow paper is a planning page for organizing their ideas and making notes.
- Ask students to fill in the information on the cover page — name, age, birthdate (day, month, and year).
- Read aloud the section entitled "Instructions" or ask students to read the instructions aloud .
- Answer any student questions about the directions.
- Ask students to open their booklet to the second page, where they will find the writing task entitled "Writing a Letter."
- Read aloud the description of the writing task, and ask students to follow you by reading silently.
- Take a few minutes to answer their questions about the task. Try to be sure they understand the task.
- Remind them about using the yellow paper to help them get started.
- When you feel they understand what they are supposed to do, please say, **"You may now begin. You have 25 minutes to complete the task"** and start timing the 25 minute period from that moment.

At the end of 25 minutes, please collect the packets. You may discard the yellow sheets of paper. Write your school, teacher, name, and class in the space provided on the cover sheet of each student's packet. If you teach only one Galaxy class, put in "A." For each additional Galaxy class that you teach, use "B," "C," "D," etc.

Hand these packets to your Data Coordinator.

Thank you very much!

Writing Activity

For Student to Fill Out:

Student Name: _____
                 (first)   (last)

Age: _____ Birthdate: _____ Boy Girl
                  month   day   year   (circle one)

Instructions

You will have 25 minutes to write a letter. Read the assignment carefully and think about it before you begin. Be sure to respond to every part of the assignment. Remember that you can use the planning page to make notes and organize your ideas.

Write your letter on the lined pages. Make your response as thoughtful and complete as possible. When you are writing your letter, be sure that your handwriting is clear.

If you finish before time is called, you should go over your work again and change anything that you think will make your writing better.

Text of First Writing Prompt[2]

Writing a Letter

A spaceship from another planet has landed on Earth. The creatures in the spaceship seem to be friendly and have let the space center in the United States know that their ship must return to their planet. Some scientists want to keep the spaceship on Earth and study the creatures. Others think the creatures should be allowed to return to their own planet.

Write a letter to the director of the space center. Tell what you think should be done with the creatures and their spaceship. Be sure to give reasons to support your ideas.

[2]Based on the fourth grade persuasive writing prompt of the National Assessment of Educational Progress (NAEP).

Directions To Teachers On Administration Of The Writing Prompt

IMPORTANT!! PLEASE REFRAIN FROM LOOKING AT THE DESCRIPTION OF THE WRITING ACTIVITY UNTIL THE TIME YOU ADMINISTER THE WRITING PROMPT. THANKS!

Note to Teachers: Students will be scored on their ability to write their ideas clearly and persuasively. They will *not* be scored on spelling or form.

Please proceed as follows:

- See that each student receives **one** copy of the "writing packet" and **one** piece of yellow blank paper. The yellow paper is a planning page for organizing their ideas and making notes.
- Ask students to fill in the information on the cover page — name, age, birthdate (day, month, and year).
- Read aloud the section entitled "Instructions" or ask students to read the instructions aloud .
- Answer any student questions about the directions.
- Ask students to open their booklet to the second page, where they will find the writing task entitled "Writing a Letter."
- Read aloud the description of the writing task, and ask students to follow you by reading silently.
- Take a few minutes to answer their questions about the task. Try to be sure they understand the task.
- Remind them about using the yellow paper to help them get started.
- When you feel they understand what they are supposed to do, please say, **"You may now begin. You have 25 minutes to complete the task"** and start timing the 25 minute period from that moment.

At the end of 25 minutes, please collect the packets. You may discard the yellow sheets of paper. Write your school, teacher, name, and class in the space provided on the cover sheet of each student's packet. If you teach only one Galaxy class, put in "A." For each additional Galaxy class that you teach, use "B," "C," "D," etc.

Hand these packets to your Data Coordinator.

Thank you very much!

Writing Activity

For Teacher to Fill Out:

School: _____ Teacher: _____ Class: ____

For Student to Fill Out:

Student Name: _____
                    (first)   *(last)*

Age: _____ Birthdate: _____ Boy Girl
                     month   *day*   *year*   *(circle one)*

Instructions

You will have 25 minutes to write a letter. Read the assignment carefully and think about it before you begin. Be sure to respond to every part of the assignment. Remember that you can use the planning page to make notes and organize your ideas.

Write your letter on the lined pages. Make your response as thoughtful and complete as possible. When you are writing your letter, be sure that your handwriting is clear.

If you finish before time is called, you should go over your work again and change anything that you think will make your writing better.

Writing a Letter

For a long time, people who live near a lake called Loch Ness in Scotland have reported seeing a huge, strange animal swimming in the lake. The people said that the animal looks like a dinosaur, and they have tried to take pictures of it or catch it. The animal has been nicknamed Nessie.

Finally, a group of scientists has figured out how to catch Nessie. They want to keep the animal in their laboratory to study it. Some people have said that it is unfair to take the animal out of its natural home.

Write a letter to the scientist in charge of the project. Tell what you think should be done when they catch Nessie. Be sure to give reasons to support your ideas.

PERFORMANCE ASSESSMENT TASK 1
THEME 2

ESTABLISHING YOUR OWN SPACE
THE SECRET ROOM

Purpose

The purpose of the writing task in this performance assessment is to allow each student to state:

- how he/she perceives the situation in the Secret Room;

- what position the student would take on the situation and reasons for that position (problem/solution); and

- what suggestions she/he would offer to Jannelle, Carl, and Joey (seeing others' point of view).

What Is Being Assessed

An aspect of taking a stand (identifying a problem/proposing a solution)
Communicating in writing

Materials for the Teacher to Provide

Videotape of the A-Show to review (made during initial transmission)
Markers for students to use in small group work

Materials Packet

Fax, copy for each student (with extras as needed)
10 solution charts to be filled out in small groups
Stationery with cover sheet for individual letters

Procedures

Before Administering the Task

1. Prior to Day 1 activities, be sure you have read the letter of introduction from the staff at Far West Lab (FWL).
2. Decide the composition of the working groups for the small group activity on Day 1; the criterion may be existing groups of students, teacher choice, or student choice; the teacher should decide who would be a reliable scribe for each group.
3. Cue the tape of the A-Show as follows so that students can review relevant portions; set the video counter to 00 at the beginning of the opening rap and cue it to point 01 30 for the first segment (see below for other segments).
4. Have the solution charts and markers ready for each group of students.
5. Encourage students to take notes during the videotape or group or class discussions, if they would like, in preparation for the letter writing activity.

Day 1
1. Reviewing the A-Show (approximately 8 minutes)
    ● Tell students to pay particular attention to the problems that are developing between Jannelle, Carl, and Joey in the Secret Room; show the following segments:
        1st segment: 01 30 to 03 90   Beginning scene: Jannelle goes upstairs.
                                           Closing scene: Jannelle tells Mira she wants to be a writer or an actress.
        2nd segment: 06 75 to 07 78   Beginning scene: Jannelle hides her diary.
                                           Closing scene: Jannelle goes downstairs.
        3rd segment: 11 03 to end.   Beginning scene: Jannelle goes upstairs.

2. Sharing the Fax from FWL (3 - 5 minutes)
    ● Have students form their small groups.
    ● Distribute the fax from FWL.
    ● Read the fax orally as students follow along.
    ● Elicit from the students a few of the problems they saw developing.
    ● Elicit several suggestions for possible solutions to the problems that the children are experiencing.

3. Small Group Activity (15 to 18 minutes)
    ● Distribute the solution charts and markers.
    ● Explain that the students are to brainstorm suggestions for solutions to the problems in the Secret Room and are to discuss the advantages and disadvantages of their solutions; emphasize that the brainstorming is a prewriting activity to help students prepare to write their letters on the next day.
    ● Demonstrate on the board the way in which the scribe should fill out the solution chart. Use one of the solutions offered and elicit student comments about the advantages and disadvantages for that solution.

    2

- Remind students that there are many different solutions and all opinions should be respected.
- As students brainstorm ideas, the scribe should write brief phrases to record the ideas in the appropriate columns.
- Circulate among the small groups as students work.
- The solution charts should be taped to the wall for reference the next day to remind students of their discussions.

4. Class Discussion (10 minutes at most)
- Lead the class in a discussion to summarize the small group work.
- Ask a volunteer from each group to suggest a solution for the problems and cite an advantage and a disadvantage; remind t' em that their solutions should be practical and fair for all three children.
- Keep this discussion quick-paced and nonjudgmental.
- Record their ideas on the board or an overhead transparency so that students may refer to them on Day 2.
- Four or five reasonable solutions should have been presented by the end of the discussion. Elicit additional suggestions as needed.

Day 2

1. Brief Review and Assignment (3-5 minutes)
- Very briefly recap the suggested solutions, advantages, and disadvantages from the previous day's class discussion.
- Quickly reread the fax with the students; remind the students to refer to the groups' charts, the class chart, and any notes that they took as they begin to write their letters.
- Pass out the stationery and point out the reminders on the cover sheet of what the students are to include in their letters; also remind them to fill in the information requested at the top of the first sheet.
- Tell the students that they will have only about 35 minutes to think up their letter and compose a first draft; pass out scratch paper if students want to make some notes before beginning to write.
- Emphasize that the letters will be evaluated on how good the students' thinking about the situation is and not on their spelling or mechanics.

2. Individual Letter Writing (35 minutes)
- Students write a letter to FWL.

To Be Distributed by Teacher
Fax from FWL   Stationery with cover sheet   Solution charts and markers

BEST COPY AVAILABLE

Time Frame
Between the A-Show and the B-Show Two consecutive school days with class periods of approximately 30-35 minutes each

What Is Turned In
Individual letters

4

Text of Fax for Performance Assessment 1

Dear Galaxy Student,

We've been watching the Galaxy broadcasts along with you. We would like to find out what you think about what is happening as THE HOUSE.

This week Jannelle, Joey, and Carl are having problems sharing the Secret Room. We are wondering if they will find a way to solve their problems.

What do you think is the best way for the kids at the house to work things out? Please write a letter to us explaining your solution and tell why it's best for the kids at THE HOUSE. Try to convince us that your idea is a good one. You may want to include some of your own experiences about sharing space with others at home or at school.

Before you write your letter, put your heads together with others from your class and see what their ideas are.

Thanks for your help!

Andrea, Cliff, Gloria, and Sue
Far West Laboratory, San Francisco

STUDENT NAME _____

TEACHER_____

GRADE _____

SCHOOL _____

DATE _____

INSTRUCTIONS

Use these pages to write to us at Far West Lab.

1. Write a sentence or two about what has happened so far.

2. Tell what you think the **BIG** problem is.

3. Make suggestions about how Jannelle, Joey, and Carl can solve their problems.

4. Be sure to give **REASONS** for your suggestions.

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APPENDIX F: PERFORMANCE ASSESSMENT 2

> ## PERFORMANCE ASSESSMENT TASK 2
>
> ### THEME 3
>
> ### WHO IS A HERO?

Purpose

The purpose of this performance assessment is to allow each student to:

- state how he/she defines hero (what characteristics does a hero have)
- develop a drawing depicting an individual whom the student considers heroic
- prepare a written discussion that cites evidence to support the student's selection

---

What Is Being Assessed

Taking a stand/presenting a position and offering supporting evidence
Communicating in writing

Time Frame

Between A-Show and B-Show
Two consecutive school days with class periods of approximately 30 minutes each

---

Materials for the Teacher to Provide

Paper and drawing materials

Materials Packet

Stationery with cover sheet for student's written work
Fax from Far West Lab (FWL)
Master copy of "The True Story of a 12 year-old Hero" from The Second Story magazine
for Theme 3 for duplication (in the event magazines have been sent home)

Procedures

Before Task 2 is administered:

1. Decide the composition of the working groups for the small group activity on Day 1; the criterion may be existing groups of students, teacher choice, or student choice.
2. Make sure that you have a full class set of the Galaxy magazine The Second Story, Volume 1, Issue 3; they will be reading "The True Story of a 12 year-old Hero." OR If you have sent the magazine home with your students, please use the master copy of the story provided in your materials packet to make copies for the students in your class.
3. Have students sitting in their working groups before the task begins.
4. Write HEROIC CHARACTER TICS as a heading on the board or on chart paper; if the chart is written on the board, be sure that it can be kept intact until Day 2 of the activity.

Day 1

1. **Class Discussion (15 minutes)**

   - Introduce the lesson by saying that students are going to consider characteristics of individuals who can be considered heroes. Their work will consist of class and small group discussion, preparation of drawings, and writing. (See the last page of these instructions for options about displaying the drawings.)
   - Have students turn to "The True Story of a 12 year-old Hero" on the last page of the magazine or hand out the copies you have made.
   - Read "The True Story" orally as students follow along; this reading should not take long.
   - Lead the class in a quick-paced discussion of the characteristics of people who can be considered heroic. Students may mention the characteristics depicted in the story from The Second Story or characteristics of other individuals; they should be encouraged to draw upon their own ideas and upon literature they have read. Be sure students mention or acknowledge diverse characteristics of heroes that include (but are not limited to) those listed:
     - Ordinary people can be heroic.
     - Heroic people can be any age.
     - Both females and males can be heroic.
     - Heroes can have weakness as well as strengths.
     - Heroes may not always succeed at everything they try to do.
     - There are disadvantages to being considered a hero.
   - As the students make suggestions, summarize their ideas by listing brief descriptive phrases on the HEROIC CHARACTERISTICS chart. Help the students recognize the following:
     - The usual concept of "hero" from sports or entertainment is different from the idea being discussed here; people from these fields may become heroes, but their identities as "stars" do not immediately make them heroic.
     - There is a difference between being a hero and being a "helper"; this concept will be developed further in Task 3 (Theme 6).

2

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- Stress that people usually do not plan to become heroic; often, a person becomes a hero by responding to extraordinary circumstances (that are often dangerous) in highly extraordinary ways (that often put the person "on the line" in some way); in other cases, individuals live their lives in heroic ways, working for the causes and issues that they consider important and often overcoming social, political, physical, or other obstacles.

2. **Small Group Activity (5-7 minutes)**

- Tell the students that they are to spend the next few minutes extending the class discussion; this small group work will help students affirm their individual concepts about heroes.
- State that each group member is to think of people whom they consider to be heroes and that they will have to select one of those people to depict in a drawing and to discuss further in writing. In their discussion, they are to provide evidence to support their choice by citing characteristics and behaviors that have made these people heroes; this process should help students identify the one person about whom they will write.

3. **Preparation of Drawings (10 minutes)**

- Tell the students to begin drawing about one person (young or old, female or male) whom they consider a hero; they may draw a portrait or a scene depicting some aspect of the person's life; they should also write a few phrases that capture why their selection can be considered a hero, referring if necessary to the chart developed by the teacher.
  [Note: While the drawings may be displayed in the classroom at the end of the activity, stress that now students should consider their drawing a prewriting exercise; if they do not finish their drawings within the time period, they may finish them later; if they are reluctant to draw ("I'm not a good artist"; "I don't know what the person really looked like," etc.), reassure them that they will not be "graded" on their artistic ability or accuracy.]
- Circulate among the small groups as students work, providing help and encouragement; make sure that each student has written the name of the hero on the drawing.
- After 10 minutes, call time again and ask students to share their hero and their thoughts about what makes this person heroic with their group; make sure they realize that their efforts so far may still be works-in-progress.

Day 2

1. **Brief Review and Assignment (10 minutes)**

- Read the fax from FWL and remind students that Andrea, Cliff, Gloria, and Sue are their audience.
- Briefly review the HEROIC CHARACTERISTIC chart, explaining that this material may be helpful to students as they write.

3

Language Arts Final Report

- Explain to students that they are to write about the person they selected on the previous day and are to provide evidence for their choice.
  [If students ask, tell them that they may change their choice of hero from the previous day; it is possible students will have thought more about whom they consider a hero and have new ideas.]

2. Individual Writing Assignment (20 minutes)

- Tell students to compose a first draft of the statement/letter to FWL supporting their choice.

To Be Distributed by Teacher

Stationery with cover sheet
The Second Story or copies of "The True Story of a 12 year-old Hero"

What Is Turned In

Individual written work

Options for Using the Drawings

- Arrange the drawings on a bulletin board; be sure that each drawing is labeled with the name of the hero it depicts.
- Teachers may also want to consider students' drawings a first draft of work to be revised by students and used to construct a "hero quilt" (as discussed on page 2 of the green "Sample Activities for Theme 3" supplied by Galaxy).
- Alternatively, the drawings could be revised and then published in a book for the class library.

Text of Fax for Performance Assessment 2

Dear Galaxy Student,

Hello again! Thanks for your letters about the problem at THE HOUSE. You all had some great ideas for how Jannelle, Joey, and Carl should share the secret room.

We know that you have been talking, reading, writing and drawing about heroes lately, and we would like to hear about your own personal heroes. Please send us a description of your own hero and try to convince us why you think he or she has been heroic.

We're looking forward to reading about your heroes!

Andrea, Sue, Gloria and Cliff
Far West Laboratory
San Francisco, California

STUDENT NAME _____

TEACHER _____

GRADE _____

SCHOOL _____

DATE _____

INSTRUCTIONS

Use these pages to write to us at Far West Lab
giving your description of a person you consider to
be a hero. Make sure that you:

1. Give the name of the person you have
    selected as a hero.

2. Explain why you think this person is a hero.

3. Give **REASONS** to convince Andrea, Sue,
    Gloria, and Cliff that your person is truly a
    hero.

PERFORMANCE ASSESSMENT TASK 3

THEME 6

PEOPLE NEED PEOPLE

Purpose

The purpose of this performance assessment is to allow each student to:

- state what he/she believes to be the characteristics of people who are helpers
- provide examples of actions that are helpful
- develop a drawing depicting an individual whom the student considers to be a helper
- prepare a written discussion that cites evidence to support the student's selection

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What Is Being Assessed

Taking a stand/presenting a position and offering supporting evidence
Communicating in writing

Time Frame

Between A-Show and B-Show
Two consecutive school days with class periods of approximately 30 minutes each

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Materials for the Teacher to Provide

Paper and drawing materials

Materials Packet

Stationery with cover sheet for student's written work
Fax from Far West Lab (FWL)
Copy of story about Trevor Ferrell

Procedures

Before Task 3 is administered:

1. Decide the composition of the working groups for the small group activity on Day 1; the criterion may be existing groups of students, teacher choice, or student choice.
2. Make sure that all your students have their copy of the story about Trevor Ferrell; use the copy of the story provided in your materials packet to make any extra copies that may be needed.
3. Have students sitting with their working groups before the task begins.
4. Write CHARACTERISTICS AND ACTIONS OF PEOPLE WHO ARE HELPERS as a heading on the board or on chart paper; if the chart is written on the board, be sure that it can be kept intact until Day 2 of the activity.

Day 1

1. Class Discussion (15 minutes)

   ● Introduce the lesson by telling students that they are going to consider characteristics and actions of individuals who can be considered helpers. Their work will consist of class and small group discussions, preparation of drawings, and writing. (See the last page of these instructions for options about displaying the drawings.)
   ● Read the story about Trevor Ferrell orally, as the students follow along silently on their own copies.
   ● Lead the class in a quick-paced discussion of the characteristics and actions of people who can be considered helpers. Students may mention the characteristics and actions depicted in the story of Trevor Ferrell or characteristics of other individuals. Students should be encouraged to draw upon their own ideas and experiences, and upon literature they have read. Be sure students mention or acknowledge diverse characteristics and behaviors, such as:
       ● being kind, friendly, considerate
       ● running errands
       ● visiting people who cannot leave home
       ● volunteering to baby-sit
   ● As students discuss, summarize their ideas to key phrases; enter these phrases in the chart of CHARACTERISTICS AND ACTIONS OF PEOPLE WHO ARE HELPERS. In the discussion, students may mention characteristics or actions; in all probability, students will mention both aspects of helpers. Develop the point that people who are helpers may have some heroic characteristics (as developed in Task 2) but that their behaviors are usually ongoing, long-term, and arising from a particular inclination to be helpful; discussion should include, but not be limited to, the following points:
       ● Helpers can be any age.
       ● Both females and males can be helpers.
       ● Sometimes, behaviors that are intended to be helpful may not be perceived accurately.
       ● There may be disadvantages to being considered a helper; people may take advantage of helpers.

2

- Stress that people usually do not <u>plan</u> to become helpers, any more than they plan to become heroes; also, being a helper does not have to be a full-time job, although some people, like Trevor Ferrell, find that their first helping action turns into a large and important effort; students may also suggest that nurses and teachers are helpers.

2.   **Small Group Activity: Brainstorming (5-7 minutes)**

- Tell the students that they are to spend the next few minutes extending the class discussion; this small group work will help students affirm their individual concepts about helpers.
- State that each group member is to think of people whom they consider to be helpers and that they will have to select one of those people to depict in a drawing and to discuss further in writing. In their discussion, they are to provide evidence to support their choice by citing characteristics and actions that have made these people helpers; this process should help students identify the <u>one</u> person about whom they will write. The people whom they discuss may be individuals they know personally or people they have heard or read about; encourage them to extend their thinking to people other than those in their immediate family or community but do not devalue their ideas if they insist upon writing about someone close to them. [It might be a good idea to discourage the students from writing about their teacher, however!]

3.   **Individual Preparation of Drawings (10 minutes)**

- Tell the students to begin drawing a picture about <u>one</u> person (young or old, female or male) whom they consider a helper; they may draw a portrait or a scene depicting how the person helps others; they should also write a few phrases that capture why their selection can be considered a helper, referring if necessary to the chart developed by the class and transcribed by the teacher.
  [Note: While the drawings may be displayed in the classroom at the end of the activity, stress that now students should consider their drawing a prewriting exercise: if they do not finish their drawings within the time period, they may finish them later; if they are reluctant to draw ("I'm not a good artist"; "I don't know what the person really looked like," etc.), reassure them that they will not be "graded" on their artistic ability or accuracy.]
- Circulate among the small groups as students work, providing help and encouragement. Make sure that each student has written the name of the helper on the drawing and a few phrases to describe why that person is a helper.
- After 10 minutes, call time again and ask students to share ideas about their helper and their thoughts about what makes this person helpful with their group; make sure they realize that their efforts so far may still be works-in-progress.

<u>Day 2</u>

1.   **Brief Review and Assignment (10 minutes)**

- Read the fax from FWL and remind students that Andrea, Cliff, Gloria, and Sue are their audience.
- Review the CHARACTERISTICS AND ACTIONS OF PEOPLE WHO ARE HELPERS chart, explaining that this material may be helpful to students as they write.

- Explain to students that they are to write about the person they selected on the previous day and are to provide evidence for their choice.

  [If students ask, tell them that they may change their choice of helper from the previous day; it is possible students will have thought more about whom they consider a helper and have new ideas.]

2. Individual Writing Assignment (20 minutes)

- Tell students to compose a first draft of the statement/letter to FWL supporting their choice.

To Be Distributed by Teacher
Stationery with cover sheet Story about Trevor Ferrell

What Is Turned In
Individual written work

Options for Using the Drawings
• Arrange the drawings on a bulletin board; be sure that each drawing is labeled with the name of the helper it depicts. • Teachers may want to consider students' drawings a first draft of work to be revised by students and used to construct a "helper quilt" (as discussed on page 2 of the green "Sample Activities for Theme 6" supplied by Galaxy). • Alternatively, the drawings could be revised and then published in a book for the class library.

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Text of Fax for Performance Assessment 3

Dear Students,

Hello again! It was great to read about your heroes. You all had some good reasons for choosing them.

We know that you have been talking, reading, writing and drawing about helpers lately, and we would like to hear about people you think are helpers. Please send us a description of the helper you have chosen to write about. Tell us about what this person does or has done and convince us that the person is really a helper.

We're looking forward to reading about the people you think are helpful and about how they help other people!

Your Friends,

Andrea, Sue, Gloria and Cliff
Far West Laboratory
San Francisco, California

STUDENT NAME _____

TEACHER _____

GRADE _____

SCHOOL _____

DATE _____

INSTRUCTIONS

Use these pages to write to us at Far West Lab giving your description of a person you consider to be a helper. Make sure that you:

1. Give the name of the person you have selected as a helper.

2. Explain why you think this person is a helper.

3. Give **REASONS** to convince Andrea, Sue, Gloria, and Cliff that your person is truly a helper.

PERFORMANCE ASSESSMENT TASK 4

THEME 7

PEOPLE WORKING TOGETHER CAN MAKE A DIFFERENCE

Purpose

The purpose of the writing task in this performance assessment is to allow each student to state:

- how he/she perceives the situation among Carl, Miguel, and Joey;

- what position the student would take on the situation and reasons for that position (problem/solution); and

- what suggestions she/he would offer to Carl, Miguel, and Joey (seeing others' point of view).

What Is Being Assessed

An aspect of taking a stand (identifying a problem/proposing and supporting a solution)
Communicating in writing

Time Frame

Between the A-Show and the B-Show
Two consecutive school days with class periods of approximately 30-35 minutes each

Materials for the Teacher to Provide

Videotape of the A-Show to review (make sure to record the A-Show during initial transmission)
Markers for students to use in small group work
Scratch paper for students to take notes or organize their ideas before writing

Materials Packet
Fax, copy for each student (with extras as needed) 10 solution charts to be filled out in small groups Stationery with cover sheet for individual letters

Procedures

Before Administering the Task

1. Decide the composition of the working groups for the small group activity on Day 1; the criterion may be existing groups of students, teacher choice, or student choice; the teacher should decide who would be a reliable scribe for each group.
2. Cue or fast forward the tape of the A-Show to immediately after the opening rap so that students can review the show.
3. Have the solution charts and markers ready for each group of students.
4. Encourage students to take notes during the videotape or during group or class discussion in preparation for the letter-writing activity.

Day 1
1. Reviewing the A-Show (approximately 10-15 minutes)
   ● Tell students that as they review the A-Show, they should pay particular attention to the problems developing among Miguel, Carl, and Joey with regard to their act for the talent show.

2. Sharing the Fax from FWL (3-5 minutes)
   ● Have students form their small groups.
   ● Distribute the fax from FWL.
   ● Read the fax orally as students follow along.
   ● Elicit from the students the problems they see developing among Miguel, Joey, and Carl.
   ● Elicit several suggestions for possible solutions to the problems that the boys are experiencing.

3. Small Group Activity (15-18 minutes)
   ● Distribute the solution charts and markers.
   ● Explain that the students are to brainstorm suggestions for solutions to the problems among Joey, Miguel, and Carl and are to discuss the advantages and disadvantages of their solutions; emphasize that the brainstorming is a prewriting activity to help students prepare to write their letters on the next day.
   ● Demonstrate on the board the way in which the scribe should fill out the solution chart. Use one of the solutions offered and elicit student comments about the advantages and disadvantages for that solution.

2

- Remind students that there are many different solutions and that all opinions should be respected.
- As students brainstorm ideas, the scribe should write brief phrases to record the ideas in the appropriate columns.
- Circulate among the small groups as students work.
- The solution charts should be taped to the wall for reference the next day to remind students of their discussions.

4. **Class Discussion** (10 minutes at most)
- Lead the class in a discussion to summarize the small group work.
- Ask a volunteer from each group to suggest a solution for the problems and cite an advantage and a disadvantage of the solution; remind them that their solutions should be practical and fair for all three children.
- Keep this discussion quick-paced and nonjudgmental.
- Record their ideas on the board or an overhead transparency so that students may refer to them on Day 2.
- Four or five reasonable solutions should have been presented by the end of the discussion. Elicit additional suggestions as needed.

Day 2

1. **Brief Review and Assignment** (3-5 minutes)
- Very briefly recap the suggested solutions, advantages, and disadvantages from the previous day's class discussion.
- Quickly reread the fax with the students; remind the students to refer to the groups' charts, the class chart on the board or overhead transparency, and any notes that they took as they begin to write their letters.
- Pass out the stationery and point out the reminders on the cover sheet of what the students are to include in their letters; also remind them to fill in the information requested at the top of the first sheet if there is no label on their first sheet.
- Tell the students that they will have only about 35 minutes to think up their letter and compose a first draft; pass out scratch paper if students want to make some notes or organize their ideas before beginning to write.
- Emphasize that the letters will be evaluated on how good the students' thinking about the situation is and not on their spelling or mechanics.

2. **Individual Letter Writing** (35 minutes)
- Students write a letter to FWL.

To Be Distributed By Teacher
Fax from FWL Stationery with cover sheet Solution charts and markers Scratch paper

What Is Turned In
Individual letters

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Text of Fax for Performance Assessment 4

Dear Galaxy Student,

Wow! We can't believe that the school year is almost over and we'll be saying good-bye to Galaxy for a while. But before the year is over, we would like to find out one last time what you think about what is happening at THE HOUSE.

As you know, Miguel, Carl, and Joey are having problems working together on the talent show. In fact, they aren't working together anymore and their problems may affect the success of the show.

You have had such good ideas about how the kids at THE HOUSE could solve the other problems they have faced. What do you think is the best way for Miguel, Carl, and Joey to work things out?

Write a letter to us explaining your solution and tell why it's the best solution for the kids at THE HOUSE. Try to convince us that your idea is a good one. You may want to include some of your own experiences about working with others.

Before you write your letter, put your heads together with others from your class and see what their ideas are.

Thanks for your help!

Andrea, Cliff, Gloria, and Sue
Far West Laboratory, San Francisco

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STUDENT NAME _____

TEACHER _____

GRADE _____

SCHOOL _____

DATE _____

INSTRUCTIONS

Use these pages to write to us at Far West Lab about your solutions to the problem.

1.   Write a sentence or two about what has happened so far with the talent show.

2.   Tell what you think the **BIG** problem is.

3.   Make suggestions about how Miguel, Joey, and Carl can solve their problems can solve their problems.

4.   Be sure to give **REASONS** for your suggestions.

SCORING GUIDE: Task 1

Scoring Rationale: The directions require that the respondent take a stand by suggesting a solution to the problem Jannelle, Joey, and Carl are having sharing the Secret Room, and to provide reasons to support the solution as a good one.

5   OUTSTANDING RESPONSE
- Students present a statement that indicates they have taken a stand or that they have proposed a compromise by suggesting a solution to the problem.

- Students present an elaborated, well-developed set of compelling, logical, and thoughtful reasons to support their stand. Students indicate an awareness of multiple perspectives. As evidence to support their stand, students draw upon references from the stories at THE HOUSE, from material they have read or seen elsewhere, or from their own experience.

- It is clear from the students' work that they understand the broader issues, such as the need to respect others' right to privacy and/or the need to share space.

4   COMPETENT RESPONSE
- Students present a statement that indicates they have taken a stand or that they have proposed a compromise by suggesting a solution to the problem.

- Students present reasons to support their stand but these may be less compelling, logical, thoughtful, or diverse than in responses ranked higher. Students suggest there are multiple perspectives to the situation. The discussion may be unevenly organized but students demonstrate some development of their position.

3   SUFFICIENT RESPONSE
- Students present a statement that indicates they have taken a stand or that they have proposed a compromise by suggesting a solution to the problem.

- Students provide minimal evidence to support their solution or recommendations, with little specific detail. Responses in this category typically do not include multiple perspectives. The discussion is not well organized and/or developed.

2   MINIMAL RESPONSE
- Students state or imply a stand about the situation. They may offer suggestions about what should have been done to prevent the initial problem or assign blame, rather than suggesting a solution. For example, they may suggest that Jannelle should have taken her diary with her when she left the room, or that Mira should not have told the boys about the diary.

- Students do not offer support for their positions. The discussion is undeveloped.

1   INCOMPLETE RESPONSE
- Students attempt to respond to the topic but do not seem to have an understanding of the task and/or do not understand the problem presented in the videotape. Students respond to the topic in very general terms. For example, they may refer to getting along or needing to help each other. Alternately, they may restate the tasks or retell the events presented in the video.

0   UNSCORABLE
- Students do not respond in writing, the writing is illegible, or students may not have expressed a thought complete enough to score as a 1.

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SCORING GUIDE: Task 2

Scoring Rationale: The directions require that the respondent identify someone that is a hero and provide reasons for the choice. Writing mechanics are not to be considered when scoring.

5   OUTSTANDING RESPONSE
- Students identify a person whom they consider a hero; he/she may be from real life or from literature.

- Students give compelling, logical, and thoughtful reasons to support their choice and provide ample evidence about the person or his/her behaviors to substantiate their contention that the person has been heroic.

- It is clear from the students' work that they have selected an individual who has performed in a heroic manner at some point or who has continued to perform heroically in support of a cause or issues; students do not offer sports or entertainment personalities without specific and accurate reference to behavior that qualifies to make the person heroic; students have not confused heroic behavior with helping behavior or "stardom."

4   COMPETENT RESPONSE
- Students identify a person whom they consider a hero; he/she may be from real life or from literature.

- Students present reasons to support their choice. They provide sufficient evidence about the person or his/her behaviors to substantiate their contention that the person has been heroic, but these may be less compelling, logical, or thoughtful than in responses ranked higher; the discussion is less adequately developed and organized.

3   SUFFICIENT RESPONSE
- Students identify a hero but provide minimal evidence, with little specific detail about the person's life or behaviors to support their choice.

- The discussion is not well-organized and/or developed and may indicate some confusion about the characteristics of a hero. There may be confusion between heroic and helping behaviors; the person identified as a hero or the reasons for the selection may be inappropriate or unclear.

2   MINIMAL RESPONSE
- The discussion is poorly developed. Students identify a hero and attempt to support their position but the evidence is general and vague. Students may attempt to support their position by listing heroic attributes without any supporting examples. There may be confusion between heroic and helping behaviors.

1   INCOMPLETE RESPONSE
- Students may or may not identify a hero; they may simply state a name. They do not seem to understand the task and/or the concept of heroic behavior. They do not offer supporting evidence for their position.

0   UNSCORABLE RESPONSE
- Students do not respond in writing, the writing is illegible, or students may not have expressed a thought complete enough to score as a 1.

SCORING GUIDE: Task 3

Scoring Rationale: The directions require that the respondent identify someone that is a helper and provide reasons for their choice. Writing mechanics are not to be considered when scoring.

5   OUTSTANDING RESPONSE
- Students identify a person whom they consider a helper; he/she may be from real life or from literature.

- Students give compelling, logical, and thoughtful reasons to support their choice and provide ample evidence about the person or his/her behaviors to substantiate their contention that the person is helper.

- It is clear from the students' work that they have selected an individual who has demonstrated characteristics and/or actions of people who are helpers. People who are helpers may have some heroic characteristics, but their behaviors are usually ongoing, long-term, and arising from a particular inclination to be helpful.

4   COMPETENT RESPONSE
- Students identify a person whom they consider a helper; he/she may be someone they know personally or about whom they have read or heard.

- Students present reasons to support their choice. They provide sufficient evidence about the person or his/her behaviors to substantiate their contention that the person is a helper, but these may be less compelling, logical, or thoughtful than in responses ranked higher; the discussion is less adequately developed and organized.

3   SUFFICIENT RESPONSE
- Students identify a helper but provide minimal evidence, with little specific detail about the person's life or behaviors to support their choice.

- The discussion is not well-organized and/or developed and may indicate some confusion about the characteristics of a helper. There may be confusion between heroic and helping behaviors; the person identified as a helper or the reasons for the selection may be inappropriate or unclear.

2   MINIMAL RESPONSE
- The discussion is poorly developed. Students identify a helper and attempt to support their position but the evidence is general and vague. Students may attempt to support their position by listing attributes of a helper without any supporting examples. There may be confusion between heroic and helping behaviors.

1   INCOMPLETE RESPONSE
- Students may or may not identify a helper; they may simply state a name. They do not seem to understand the task and/or the concept of the characteristics and actions of people who are helpers. They do not offer supporting evidence for their position.

0   UNSCORABLE RESPONSE
- Students do not respond in writing, the writing is illegible, or students may not have expressed a thought complete enough to score as a 1.

SCORING GUIDE: Task 4

Scoring Rationale: The directions require that the respondent take a stand by suggesting a solution to the problem Joey, Carl, and Miguel are having working as a team for the talent show and to provide reasons to support the solution as a good one.

5   OUTSTANDING RESPONSE
- Students present a statement that indicates they have taken a stand or that they have proposed a compromise by suggesting a solution to the problem.

- Students present an elaborated, well-developed set of compelling, logical, and thoughtful reasons to support their stand. Students indicate an awareness of multiple perspectives. As evidence to support their stand, students draw upon references from the stories at THE HOUSE, from material they have read or seen elsewhere, or from their own experience.

- It is clear from the students' work that they understand the broader issues, that cooperation and teamwork are difficult yet necessary for the good of the show.

4   COMPETENT RESPONSE
- Students present a statement that indicates they have taken a stand or that they have proposed a compromise by suggesting a solution to the problem.

- Students present reasons to support their stand but these may be less compelling, logical, thoughtful, or diverse than in response ranked higher. Students suggest there are multiple perspectives to the situation. The discussion may be unevenly organized but students demonstrate some development of their position.

3   SUFFICIENT RESPONSE
- Students present a statement that indicates they have taken a stand or that they have proposed a compromise by suggesting a solution to the problem.

- Students provide minimal evidence to support their solution or recommendations with little specific detail. Responses in this category typically do not include multiple perspectives. The discussion is not well organized and/or developed.

2   MINIMAL RESPONSE
- Students state or imply a stand about the situation. They may offer suggestions about what should have been done to prevent the initial problem or they may assign blame, rather than suggesting a solution. For example, they may suggest that Carl should have asked Miguel before including Joey or that Joey should not have quit the team.

- Students do not offer support for their positions. The discussion is undeveloped.

1   INCOMPLETE RESPONSE
- Students attempt to respond to the topic but do not seem to have an understanding of the task and/or do not understand the problem presented in the videotape. Students respond to the topic in very general terms. For example, they may refer to getting along with others or needing to help each other. Alternately, they may restate the tasks or retell the events presented in the video.

0   UNSCORABLE RESPONSE
- Students do not respond in writing, the writing is illegible, or students may not have expressed a thought complete enough to score as a 1.

Scoring Guide: Writing Prompt #1

Spaceship   O1W11
Books W67, W68, W73, W77   Grade 4

Persuasive

SCORING GUIDE
Primary Trait

Primary trait: Persuasion through articulation and support of a position.

Scoring rationale: The directive requires respondents to take a position about whether the spaceship should be allowed to return to its planet, and to provide reasons to support their position.

6   Extensively elaborated. In these responses, students articulate a position for or against the return of the spaceship, or suggest a plan, and they present an extended, well-written discussion on the reasons for their position. These responses may be similar to "5" responses, but they are better organized, more clearly written, and less flawed.

5   Elaborated. In these responses, students articulate a position for or against the return of the spaceship, or suggest a plan, and they provide an extended discussion on the reasons for their position. Or they present an argument based on a strong sense of audience.

4   Developed. In these responses, students take a position for or against the return of the spaceship, or suggest a plan, and they discuss the reasons or give a brief argument for their position. Although the reasons may be more compelling or more clearly stated than in papers that received lower scores, the discussion may be unevenly developed.

3   Minimally developed. In these responses, students state or imply a position for or against the return of the spaceship and give at least one substantive reason or several brief reasons to support their stand. Or, they present a plan for resolving the problem that includes some explanation about its benefits. These papers can be brief or have vague and confusing aspects. Note: Reasons can include humanitarian appeals (e.g., the scientists would not like to be studied, the aliens have a right to live their own life.)

2   Undeveloped response to task. In these responses, students state a position for or against the return of the spaceship or they present a plan for resolving the problem, but they offer no reasons or only vague/inappropriate/irrelevant reasons to support their point of view. Or, they present confusing plans. Or, they present a reason or two on each side of the issue without articulating that they are undecided.

1   Response to topic. In these responses, students respond to the topic but do not appear to have understood the task or they may appear to state a position but the paper is largely incomprehensible. For example, they may refer to spaceships in general or about aliens visiting the earth without any indication of what to do about the problem or why. Or, they recopy text from the prompt.

SCORING GUIDE: Writing Prompt # 2

Primary trait: Persuasion through articulation and support of a position

Scoring rationale: The directive requires respondents to take a position about what should be done with Nessie when caught or argue against a capture or present a compromise.

6 **Extensively elaborated.** In these responses, students articulate a position about what should be done when Nessie is caught or argue against a capture or present a compromise. Students present an extended, well-written discussion on the reasons for their position. These responses may be similar to "5" responses, but they are better organized, more clearly written, and less flawed.

5 **Elaborated.** In these responses, students articulate a position about what should be done when Nessie is caught or argue against a capture or present a compromise. Students provide an extended discussion on the reasons for their position. Or they present an argument based on a strong sense of audience.

4 **Developed.** In these responses, students take a position about what should be done with Nessie when caught or argue against a capture or present a compromise. Students discuss the reasons or give a brief argument for their position. Although the reasons may be more compelling or more clearly stated than in papers that received lower scores, the discussion may be unevenly developed.

3 **Minimally developed.** In these responses, students state or imply a position or compromise. Students should give at least one substantive reason or several brief reasons to support their position. These papers can be brief or have vague and confusing aspects. Note: Reasons can include humanitarian appeals.

2 **Undeveloped response to task.** In these responses, students state a position about what should be done with Nessie, but they offer no reasons or only vague/inappropriate/irrelevant reasons to support their point of view. Or they present confusing plans. Or they present a reason or two on each side of the issue without articulating that they are undecided.

1 **Response to topic.** In these responses, students respond to the topic but do not appear to have understood the task or they may appear to state a position but their arguments are largely incomprehensible. For example, they may refer to dinosaurs or "monsters" in general or without any indication of what to do about the problem. Or they may recopy text from the prompt.

APPENDIX K. RESULTS FROM THE END OF YEAR TEACHER SURVEY

1. The Galaxy language arts cycle lasted 14 weeks. During approximately how many weeks was the following equipment not working? Please put an X in the appropriate box on each line.

	Never Worked	1-2 Weeks	3-4 Weeks	5-6 Weeks	7 Or More Weeks	Always Worked	
Fax machine	3 (2.9%)	26 (25.5%)	26 (25.5%)	12 (11.8%)	27 (26.5%)	8 (7.8%)	N=102
TV monitor	1 (1.0%)	9 (9.3%)	1 (1.0%)	1 (1.0%)	4 (4.1%)	81 (83.5%)	N=97
VCR	2 (2.0%)	4 (4.1%)	1 (1.0%)	2 (2.0%)	4 (4.1%)	85 (86.7%)	N=98
Voice connection (hoot 'n holler)	14 (15.7%)	8 (9.0%)	3 (3.4%)	2 (2.2%)	7 (7.9%)	55 (61.8%)	N=89

2. How often did you and/or your class use the following equipment as part of Galaxy? Please put an X in the appropriate box on each line.

	Not at All	Occasionally	Once per Week	2-3 Times per Week	Daily	
Fax machine	5 (4.9%)	19 (18.4%)	20 (19.4%)	48 (46.6%)	11 (10.7%)	N=103
TV monitor	5 (4.9%)	2 (1.9%)	12 (11.7%)	73 (70.9%)	11 (10.7%)	N=103
VCR	4 (3.8%)	5 (4.8%)	20 (19.0%)	68 (64.8%)	8 (7.6%)	N=105
Voice connection (hoot n' holler)	36 (36.4%)	46 (46.5%)	5 (5.1%)	9 (9.1%)	3 (3.0%)	N=99
Galaxy computer	68 (70.8%)	14 (14.6%)	3 (3.1%)	5 (5.2%)	6 (6.2%)	N=96
Other classroom computers	21 (21.4%)	22 (22.4%)	11 (11.2%)	19 (19.4%)	25 (25.5%)	N=98
Camcorder	12 (12.2%)	81 (82.7%)	3 (3.1%)	1 (1.0%)	1 (1.0%)	N=98

3. Many of the Galaxy program components are listed below. Please put an X in the appropriate boxes in the first column to indicate your opinion of their educational value. In the second column, indicate how well your students liked the components.

	Educational Value					Students Like				
	Great Value	Some Value	Little Value	Did Not Use		Liked a Lot	Liked Some-What	Did Not Like	Did Not Use	
Galaxy broadcasts	99 (95.2%)	5 (4.8%)	0 (0.0%)	0 (0.0%)	N=104	101 (8.1%)	2 (1.9%)	0 (0.0%)	0 (0.0%)	N=103
Galaxy themes	96 (92.3%)	8 (7.7%)	0 (0.0%)	0 (0.0%)	N=104	91 (89.2%)	10 (9.8%)	1 (1.0%)	0 (0.0%)	N=102
Galaxy activities	89 (87.3%)	12 (11.8%)	1 (1)	0 (0.0%)	N=102	79 (76.7%)	24 (23.3%)	0 (0.0%)	0 (0.0%)	N=103
Galaxy literature books	94 (91.3%)	8 (7.8%)	1 (1.0%)	0 (0.0%)	N=103	94 (90.4%)	10 (9.6%)	0 (0.0%)	0 (0.0%)	N=104
THE SECOND STORY (magazine)	60 (58.8%)	39 (38.2%)	2 (2.0%)	1 (1.0%)	N=102	67 (66.3%)	34 (33.7%)	0 (0.0%)	0 (0.0%)	N=101
THE MAX	41 (41.8%)	43 (43.9%)	7 (7.1%)	7 (7.1%)	N=98	48 (49.5%)	40 (41.2%)	2 (2.1%)	7 (7.2%)	N=97
Galaxy portfolios	55 (54.5%)	36 (35.6%)	8 (7.9%)	2 (2.0%)	N=101	51 (52.0%)	39 (39.8%)	5 (5.1%)	3 (3.1%)	N=98
Use of fax machine	75 (73.5%)	18 (17.6%)	4 (3.9%)	5 (4.9%)	N=102	86 (86.0%)	6 (6.0%)	0 (0.0%)	8 (8.0%)	N=100
Use of voice connection	11 (11.2%)	26 (27.1%)	19 (19.8%)	40 (41.7%)	N=96	24 (25.8%)	17 (18.3%)	2 (2.2%)	50 (53.8%)	N=93
Reviewing broadcasts with VCR	89 (86.4%)	11 (10.7%)	1 (1.0%)	2 (1.9%)	N=103	90 (88.2%)	9 (8.8%)	1 (1.0%)	2 (2.0%)	N=102
Galaxy partner school communications	44 (42.3%)	27 (26.0%)	18 (17.3%)	15 (14.4%)	N=104	62 (63.3%)	23 (23.5%)	5 (5.1%)	8 (8.2%)	N=98
Communications with other Galaxy teachers	31 (30.4%)	34 (33.3%)	10 (9.8%)	27 (26.5%)	N=102	33 (35.5%)	20 (21.5%)	0 (0.0%)	40 (43.0%)	N=104

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4. Student use of a fax machine is one of the innovative features of the Galaxy Classroom. We are interested in how helpful the following activities were in encouraging students to read and write.

	Student Enthusiasm About Reading and Writing				
	Very Enthusiastic	Somewhat Enthusiastic	Not Enthusiastic	Did Not Do	
Student faxing within your school	53 (53.5%)	16 (16.2%)	4 (4.0%)	26 (26.3%)	N=99
Student faxing to partner/other school	74 (74.0%)	17 (17.0%)	2 (2.0%)	7 (7.0%)	N=100
Student faxing to THE HOUSE	82 (81.2%)	14 (14.6%)	0 (0.0%)	5 (5.0%)	N=101
Student faxing to THE MAX	64 (64.0%)	26 (26.0%)	3 (3.0%)	7 (7.0%)	N=100
Receiving faxes from within your school	46 (46.0%)	23 (23.0%)	4 (4.0%)	27 (27.0%)	N=100
Receiving faxes from partner/other school	69 (69.1%)	9 (9.1%)	3 (3.0%)	18 (18.2%)	N=99
Seeing faxes on the B-Show	83 (80.6%)	14 (13.6%)	3 (29.%)	3 (2.9%)	N=103
Receiving THE MAX	53 (52.0%)	35 (34.3%)	11 (10.8%)	3 (2.9%)	N=99

5. Please rate the usefulness of the following in helping you to implement Galaxy with your students:

I. Teacher Resource Materials	Very Useful	Somewhat Useful	Not Very Useful	Did Not Use	
A. Theme folders					
Show synopses	84 (83.?%)	15 (14.9%)	1 (1.0%)	1 (1.0%)	N=101
List of critical issues	83 (81.4%)	18 (17.6%)	1 (1.0%)	1 (1.0%)	N=102
Literacy strategies and demonstration	87 (86.1%)	14 (13.9%)	0 (0.0%)	0 (0.0%)	N=101
Literary references	75 (75.8%)	21 (21.2%)	2 (2.0%)	1 (1.0%)	N=99
Lesson plans/activities	96 (94.1%)	5 (4.9%)	1 (1.0%)	0 (0.0%)	N=102
Written copy of the raps	65 (64.4%)	31 (30.7%)	3 (3.0%)	2 (2.0%)	N=101
Theme bibliographies	76 (75.2%)	24 (23.8%)	1 (1.0%)	0 (0.0%)	N=101
B. Other Materials					
Teacher Resource Book	84 (86.6%)	11 (11.3%)	1 (1.0%)	1 (1.0%)	N=97
Literacy Activities Handbook	81 (82.7%)	16 (16.3%)	0 (0.0%)	1 (1.0%)	N=98

II. Technical Aids	Very Useful	Somewhat Useful	Not Very Useful	Did Not Use	
1-800 phone number for technology problems	65 (66.3%)	12 (12.2%)	4 (4.1%)	17 (17.3%)	N=98
Galaxy technical manual (fax, VCR, etc.)	45 (44.6%)	36 (35.6%)	12 (11.9%)	8 (7.9%)	N=98

III. Staff development	Very Useful	Somewhat Useful	Not Very Useful	Did Not Use	
Los Angeles Institute	80 (84.2%)	8 (8.4%)	2 (2.1%)	5 (5.3%)	N=95
Atlanta Institute	78 (81.3%)	11 (11.5%)	0 (0.0%)	7 (7.3%)	N=96
Teacher newsletter	41 (46.6%)	30 (34.1%)	8 (9.1%)	9 (10.2%)	N=96
Technical teleconference (April)	25 (29.1%)	21 (24.4%)	7 (8.1%)	33 (38.4%)	N=86

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6. In your opinion, how well does Galaxy reach the following students:

	Very well	Somewhat well	Not very well	Not applicable	
Boys	95 (90.5%)	10 (9.5%)	0 (0.0%)	0	N=105
Girls	98 (94.2%)	6 (5.8%)	0 (0.0%)	0	N=104
Spanish LEP	41 (91.1%)	4 (8.9%)	0 (0.0%)	43	N=88
Other LEP	19 (23.8%)	11 (13.8%)	50 (62.5%)	0	N=80
New immigrants	20 (66.7%)	9 (30.0%)	1 (3.3%)	52	N=82
High-performing	91 (94.8%)	5 (5.2%)	0 (0.0%)	3	N=99
Low-performing	86 (85.1%)	13 (12.9%)	2 (2.0%)	0	N=101
Multicultural populations	83 (93.3%)	6 (6.7%)	0 (0.0%)	8	N=97
Low socio-economic background	92 (92.9%)	6 (6.1%)	1 (1.0%)	0	N=99
Hearing-impaired	27 (93.1%)	2 (6.9%)	0 (0.0%)	59	N=88
Learning-disabled	52 (81.3%)	12 (18.8%)	0 (0.0%)	32	N=96
Behavior-disordered	55 (77.8%)	16 (22.2%)	1 (1.4%)	24	N=96
Other special education	36 (83.7%)	7 (16.3%)	0 (0.0%)	38	N=91

7. In your opinion, how well does Galaxy reach students in the following groups:

	Very well	Somewhat well	Not very well	Not applicable	
White (non-Hispanic)	76 (91.6%)	5 (6.0%)	2 (2.4%)	16	N=99
Hispanic	66 (97.1%)	2 (2.9%)	0 (0.0%)	29	N=97
African American	89 (94.7%)	5 (5.3%)	0 (0.0%)	9	N=103
Asian or Pacific Islanders	36 (76.6%)	11 (23.4%)	0 (0.0%)	46	N=93
Native American	29 (90.6%)	3 (9.4%)	0 (0.0%)	57	N=89
Other groups	1 (100.0%)	0 (0.0%)	0 (0.0%)	31	N=32

8. How much has Galaxy helped you to do the following:

	A Lot	Somewhat	A Little	Not at All	
Recognize individual strengths	52 (51.55%)	41 (40.6%)	6 (5.9%)	2 (2.0%)	N=101
Enhance students' self-esteem	70 (68.6%)	28 (27.5%)	3 (2.9%)	1 (1.0%)	N=102
Turn students on to school	67 (66.3%)	28 (27.7%)	4 (4.0%)	2 (2.0%)	N=101
Enable students to value cultural diversity	57 (55.9%)	38 (37.3%)	6 (5.9%)	1 (1.0%)	N=102
Develop a more meaningful relationship with your students	60 (59.4%)	29 (28.7%)	7 (6.9%)	5 (5.0%)	N=101

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9. How well does Galaxy help students to:

	Very Well	Somewhat Well	Not Very Well	Not At All	
Brainstorm (cluster) to generate ideas for writing	79 (77.5%)	23 (22.5%)	0 (0.0%)	0 (0.0%)	N=102
Write more frequently	84 (82.4%)	15 (14.7%)	1 (1.0%)	2 (2.0%)	N=102
Revise writing for meaning	38 (37.6%)	55 (54.5%)	6 (5.9%)	2 (2.0%)	N=101
Reflect on and respond to what they read and write	61 (61.6%)	36 (36.4%)	1 (1.0%)	1 (1.0%)	N=99
Write for "real" audiences	77 (76.2%)	23 (22.8%)	1 (1.0%)	0 (0.0%)	N=101
Debate issues, using evidence	58 57.4%	40 (39.6%)	3 (3.0%)	0 (0.0%)	N=101
Engage in critical thinking	71 (70.3%)	30 (29.7%)	0 (0.0%)	0 (0.0%)	N=101
View themselves as confident, competent users of language	54 (53.5%)	43 (42.6%)	4 (4.0%)	0 (0.0%)	N=101
See an issue from multiple perspectives	57 (66.3%)	32 (31.7%)	2 (2.0%)	0 (0.0%)	N=101
Make meaning from text (predictions and context)	65 (64.4%)	35 (34.7%)	1 (1.0%)	0 (0.0%)	N=101
Make meaning from other media	67 (67.0%)	29 (29.0%)	4 (4.0%)	0 (0.0%)	N=100
Work productively in collaborative groups	58 (57.4%)	42 (41.6%)	1 (1.0%)	0 (0.0%)	N=101
Relate the Galaxy themes to their own experience	85 (84.2%)	15 (14.9%)	1 (1.0%)	0 (0.0%)	N=101
Develop an in-depth understanding of the seven themes	59 (58.4%)	39 (38.6%)	3 (3.0%)	0 (0.0%)	N=101

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10. Since Galaxy began, my students:

	True for Most	True For Some	True for a Few	Not True for Any	Rank of Importance*	
Have a better attitude about reading and writing	59 (59.0%)	32 (32.0%)	9 (9.0%)	0 (0.0%)	42	N=100
Are more willing to undertake writing assignments	57 (54.8%)	39 (36.5%)	6 (5.8%)	2 (1.9%)	40	N=104
Do a better job of working with their peers to solve problems	37 (35.9%)	49 (47.6%)	15 (14.6%)	2 (1.9%)	31	N=103
Read more	53 (52.0%)	31 (29.8%)	18 (17.3%)	2 (1.9%)	30	N=104
Are more willing to write on their own	53 (51.0%)	40 (38.5%)	8 (7.7%)	3 (2.9%)	29	N=104
Speak up more in class discussion	49 (47.1%)	46 (44.2%)	8 (7.7%)	1 (1.0%)	25	N=104
Have a better attitude about school	55 (52.9%)	33 (31.7%)	14 (13.5%)	2 (1.9%)	23	N=104
Reason about issues with their peers	40 (38.8%)	43 (41.7%)	19 (18.4%)	1 (1.0%)	18	N=103
Misbehave less during Galaxy than at other times	61 (59.2%)	30 (29.1%)	11 (10.7%)	1 (1.0%)	17	N=103
Misbehave in class in general less than before Galaxy	17 (17.3%)	50 (51.0%)	23 (23.5%)	8 (8.2%)	6	N=98
Are absent less than they were before Galaxy	24 (24.7%)	30 (30.9%)	20 (20.6%)	23 (23.7%)	4	N=97
Complete Galaxy homework more than other subjects	39 (39.8%)	34 (34.7%)	16 (16.3%)	9 (9.2%)	3	N=98
Complete homework in general more often	14 (14.0%)	48 (48.0%)	25 (25.0%)	13 (13.0%)	1	N=100

* Based on teacher selection of the three most important behaviors