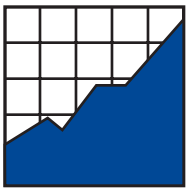
ELLs with Disabilities Report 11

Student Perceptions of Instructional Strategies: Voices of English Language Learners with Disabilities



NATIONAL CENTER ON EDUCATIONAL OUTCOMES

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Student Perceptions of Instructional Strategies: Voices of English Language Learners with Disabilities

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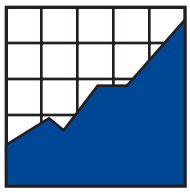
July 2005



NATIONAL CENTER ON EDUCATIONAL OUTCOMES

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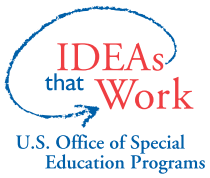

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Introduction

The rapid increase of culturally diverse populations with special needs in the United States has important implications for delivering grade-level, standards-based instruction to English language learners with Individualized Education Programs (ELL/IEP students). One of the major challenges in both special education and bilingual education is the dearth of research on ELL/IEP students' needs. To be consistent with federal education law requirements, there is a need to focus on content in at least three areas—reading, mathematics, and science. As indicated in the 2001 No Child Left Behind Act (NCLB):

> *By the 2005–06 school year, states must develop and implement annual assessments in reading and mathematics in grades 3 through 8 and at least once in grades 10–12. By 2007–08, states also must administer annual science assessments at least once in grades 3–5, grades 6–9, and grades 10–12. These assessments must be aligned with state academic content and achievement standards and involve multiple measures, including measures of higher order thinking and understanding* (20 U.S.C. 6311(b)(3)).

In the content area of reading, for example, research highlights the importance of specific strategies tailored to ELL/IEP students' needs (England, Collins, & Algozzine, 2002). The quality of instruction depends on the application of appropriate teaching strategies (Langdon, 2002). It is important to investigate which instructional strategies are most effective for students who are English language learners with IEPs.

All students in general, and ELL/IEP students in particular, are major stakeholders in the educational system. Their voices should be heard by educators, policymakers, and researchers to enhance the educational process. According to Kordalewski (1999, p. 4), "acknowledging the importance of student voice in the classroom means acknowledging students' active role in the learning process." Research suggests that ELL/IEP students may not always communicate their needs effectively when faced with more complex learning material and greater demands (Langdon, 2002). This study was conducted to ensure that we learn from Hmong students with disabilities about their preferred methods of instruction.

The present study builds on earlier work in which educators of ELL/IEP students were asked about instructional strategies (Thurlow, Albus, Shyyan, Liu, & Barrera, 2004). Specifically, educators generated and weighted the importance, feasibility, and use of content areas and instructional strategies for delivering grade-level, standards-based instruction to ELL/IEP students. Although initial strategies included in the research were from Gersten, Baker, and Marks (1998), 30 educators added strategies to that list. The final list of instructional strategies included 27 reading strategies, 19 mathematics strategies, and 23 science strategies.

This study was undertaken to obtain students' input on the instructional strategies generated by educators. The following questions served as the focus of this study:

1. What instructional strategies do ELL/IEP students consider important in reading, mathematics, and science standards-based instruction?

2. What instructional strategies are feasible, as perceived by ELL students with disabilities?

3. What instructional strategies are employed in the instruction of ELL students with disabilities?

Method

Multiple definitions for the same subject or phenomenon exist in the domain of education. For the purposes of this study, the following definitions were employed:

> *English language learners with Individualized Education Programs (ELL/IEP students)* are students whose primary or native language is not English, who have difficulty in using English (i.e., reading, writing, speaking, and listening) and who have a special education plan, based on their unique needs, containing a statement of their present level of performance, educational needs, goals, and measurable objectives.
>
> *An instructional strategy* is a purposeful activity to engage learners in acquiring new behaviors or knowledge. An instructional strategy should have clearly defined steps or a clear description of what the teacher does.

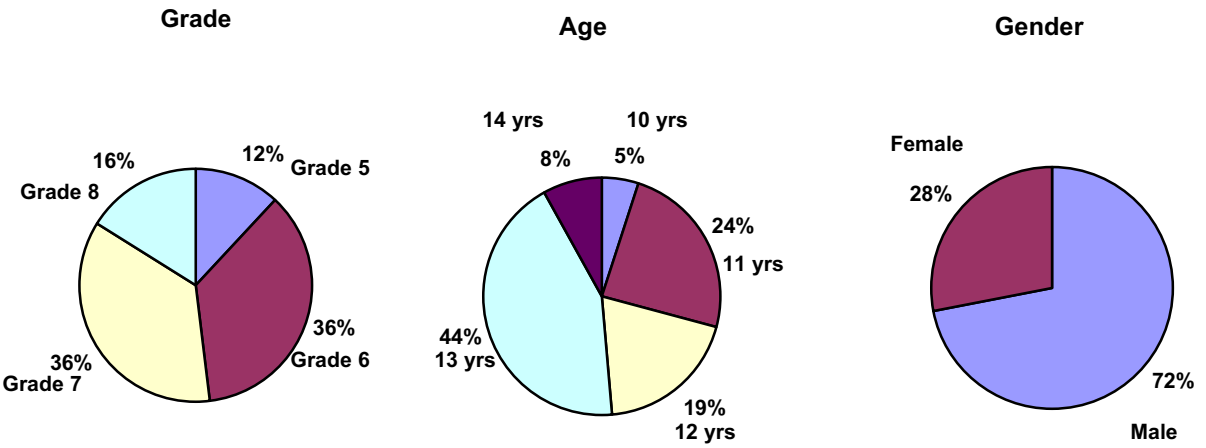
Participants.

The research sample included 25 Hmong students with disabilities from four urban charter schools in Minnesota. Middle school students from grades 5 through 8 were invited to participate in the study. The demographic survey results indicated that more than half of the students (56%) had resided in the U.S. for over 10 years; 36% of the students involved in the study had lived in the U.S. for 5–10 years; and 8% of the students were U.S. residents for 1–5 years.

Figure 1 shows the distribution of research participants according to their grade, age, and gender. According to the grade chart, the two largest groups of students were sixth- and seventh-graders, followed by eighth-graders and fifth-graders. The age figure describes the age of research par-

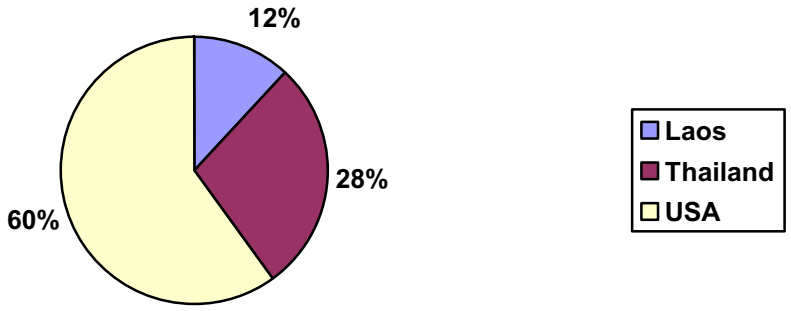
ticipants. The largest age group is 13-year-old students, the second largest group is 11-year-old students, and the third largest group is 12-year-old students. Boys constituted over two-thirds of the study participants; this distribution is shown in the gender figure.

Figure 1. Research Subjects by Grade, Age, and Gender



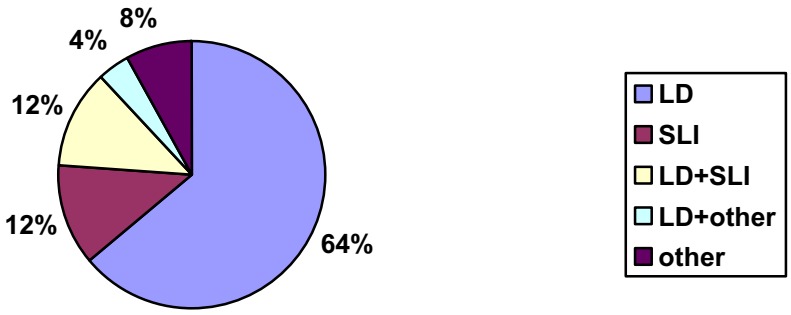
To obtain a better understanding of the students' background, a question about their country of origin was included in the demographic survey. Knowing the students' origin helps researchers understand their educational needs. Figure 2 summarizes the results generated by the question. Most of the students were born in the U.S., but were enrolled in bilingual education programs. Two other countries were represented—Thailand (28%) and Laos (12%).

Figure 2. Students' Country of Origin



The students' primary disability is shown in Figure 3. The majority of students (64%) had learning disabilities (LD). The next largest group of students (12%) had speech language impairments (SLI). The remaining 24% of students had either a combination of a learning disability with another disability or some other disability (deaf/hard of hearing or visually-impaired). Knowing the research subjects' primary disabilities was fundamental to the study because students in some disability categories are more likely than others to be included in grade-level content

Figure 3. Students by Disability



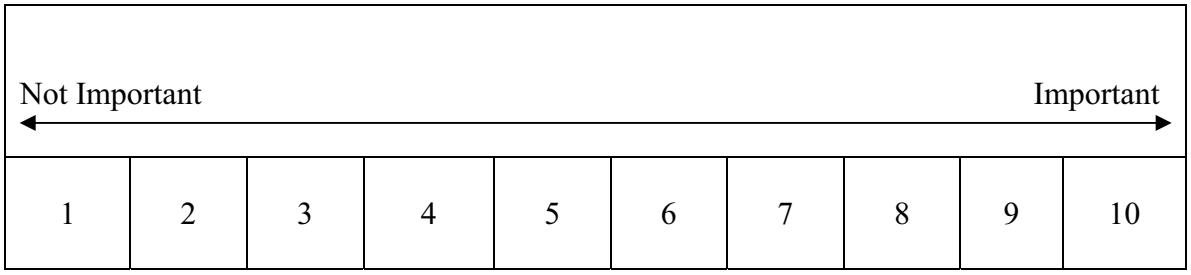
instruction. Knowing the disability category also allowed the researchers to categorize the data by students' disability and analyze them that way.

In general, the demographic findings suggest that research subjects with diverse backgrounds and experiences participated in the study. They reflect the characteristics of ELLs and students with disabilities and the diversity of the student population from which they were selected.

Procedure

A modified version of the focus group Multi-Attribute Consensus Building (MACB) research method was used to collect students' perceptions about instructional strategies. MACB is a quantitative, objective approach for determining a small group's opinion about the importance of each item in a list (Vanderwood, Ysseldyke, & Thurlow, 1993). The study participants were presented with a list of content areas and instructional strategies and then each member was asked to weight the importance of each item in the list. Instead of using the 0–100 weighting scale where a zero represented very unimportant strategies and one hundred represented very important ones (which is what educators used), the scale for students was simplified. The students' scale used a 1–10 range as shown in Figure 4.

Figure 4. The Weighting Scale



The language of the strategy list generated by teachers was also simplified for use with students. For example, a reading strategy *practicing paraphrasing and retelling* was modified into *using your own words to describe what you read*. Appendix A contains the list of all strategies, their corresponding explanations for students, and strategy definitions.

Before the beginning of each focus group session, the students' teachers were asked to complete a brief demographic survey, which addressed the students' grade, age, gender, home location, ethnicity, country of origin, primary language, length of time residing in Minnesota, and disability. Students' identities were removed from each survey sheet and code numbers were assigned to each student.

Students were invited to weight the importance of each content area and instructional strategy by circling a digit on the 1–10 scale. The weightings were entered instantly into a Microsoft Excel worksheet and projected onto a screen for students to see their weightings. This allowed them to be able to discuss the weightings and to change them if necessary.

In the second stage of the focus group process, students were asked to comment on feasibility and use of each instructional strategy. For the feasibility section the following question was asked: *How easy or difficult is it for your teacher to do this?* Four response options were offered: *difficult, somewhat difficult, somewhat easy,* and *easy*. The use dimension of each strategy was addressed with the question, *How often does your teacher do this?* Students could choose among the following options: *never, sometimes, often,* and *always*.

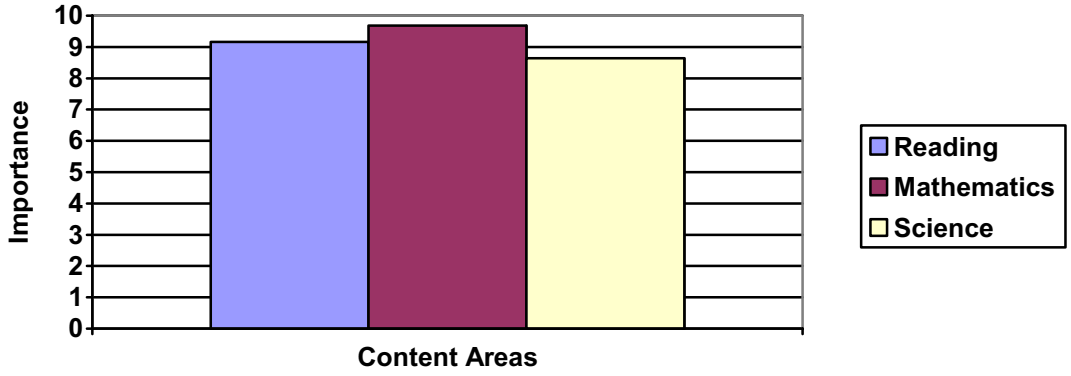
Results

Importance of Content Areas and Instructional Strategies

The first research question of the study focused on the importance of three content areas (reading, mathematics, and science) and corresponding instructional strategies in these areas. As Figure 5 shows, the Hmong students with disabilities considered the three content areas almost equally important. Mathematics was weighted the highest with the mean score of 9.68 on the scale of 10 points. Reading was weighted as the next highest in importance content area with the average score of 9.16. Science ranked third with the mean of 8.64. The MACB methodology requires that at least one content area be given a weighting of 10 in each individual case. The results show that mathematics was rated highest in most cases but reading and science were also considered to be important content areas.

The research instrument included 27 reading, 19 mathematics, and 23 science instructional strategies. Overall, the ELL/IEP students weighted the strategies as "important." The average weightings did not drop below six on the ten-point scale. Appendix B contains the list of all

Figure 5. Importance of Content Areas



teaching strategies for reading, mathematics, and science, as well as their minimum and maximum weightings, standard deviations, and average weightings for each strategy.

Table 1 shows the top five strategies for each content area weighted as most important and least important and their corresponding scores. The following reading strategies were considered most important by research subjects: direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments; specific informal assessments based on curriculum (Curriculum-Based Probe); fluency building (high frequency words); tactile vocabulary development steps; and combining kinesthetic and phonemic awareness. As weighted by students, the least important reading strategies were: using a book on tape as support; acting out a story; oral sharing on a related topic; prediction; and visualization of a story (draw a scene, plot, etc.).

As it is shown in Table 1, the top weighted strategies in the area of mathematics were: problem solving instruction and task analysis strategies; reciprocal peer tutoring (RPT) to improve math achievement; model-lead-test strategy instruction (MLT); explicit vocabulary building and random, recurrent assessments; and monitoring of progress through group and individual achievement awareness charts. Mathematics strategies weighted as least important were: students generate word problems; daily re-looping of previously learned material; ecological approach/ generating data from real life experiences to use in class; a response journal; and tactile, concrete experiences of math.

The following were the top weighted science strategies (see Table 1): pre-teaching vocabulary; peer tutoring; teaching how to pick out the main idea of the text and justify it; using visuals; and a KWL chart. The least important instructional strategies for this content area were: using response cards during instruction to answer teacher questions; specific informal assessments based on curriculum (Curriculum-Based Probe); graphic organizers such as semantic and con-

ceptual mapping; use of diagrams to teach cause and effect; and use of Venn diagrams.

Table 1. Importance of Instructional Strategies

Content Area	Most Important (Weighting)	Least Important (Weighting)
Reading	Direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments (8.84)	Using a book on tape as support (6.52)
	Specific informal assessments based on curriculum (Curriculum-Based Probe) (8.80)	Acting out a story (7.08)
	Fluency building (high frequency words) (8.76)	Oral sharing on a related topic (7.28)
	Tactile vocabulary development steps (8.64)	Prediction (7.32)
	Combining kinesthetic and phonemic awareness (8.52)	Visualization of a story (draw a scene, plot, etc.) (7.52)
Mathematics	Problem solving instruction and task analysis strategies (9.48)	Students generate word problems (7.36)
	Reciprocal peer tutoring (RPT) to improve math achievement (9.28)	Daily re-looping of previously learned material (7.44)
	Model-lead-test strategy instruction (MLT) (9.12)	Ecological approach/generating data from real life experiences to use in class (7.52)
	Explicit vocabulary building and random, recurrent assessments (9.00)	A response journal (7.64)
	Monitoring of progress through group and individual achievement awareness charts (8.68)	Tactile, concrete experiences of math (7.76)
Science	Pre-teaching vocabulary (9.04)	Using response cards during instruction to answer teacher questions (7.24)
	Peer tutoring (9.04)	Specific informal assessments based on curriculum (Curriculum-Based Probe) (7.76)
	Teaching how to pick out the main idea of the text and justify it (8.88)	Graphic organizers such as semantic and conceptual mapping (7.96)
	Using visuals (8.88)	Use of diagrams to teach cause and effect (8.12)
	KWL chart (8.80)	Use of Venn diagrams (8.12)

Feasibility and Use of Instructional Strategies

The second and third research questions focused on feasibility and use of each strategy. Students were asked the following two questions on the content area instructional strategies:

1. How easy or difficult is it for your teacher to do this?

2. How often does your teacher do this?

Table 2 summarizes the top five most feasible and least feasible reading, mathematics, and science instructional strategies as identified by students. The analysis results show that the five most feasible strategies in reading were: partner reading; using a book on tape as support; picture-word replacement – use of visuals for words; specific informal assessments based on curriculum (Curriculum-Based Probe); and visualization of a story (draw a scene, plot, etc.). Students selected the following five reading strategies as the least feasible ones: explicit teaching of text structure; chunking and questioning aloud (reading mastery); relating reading to student experiences; oral sharing on a related topic; and tactile vocabulary development steps.

Table 2. Feasibility of Instructional Strategies

Content Area	Most Feasible Strategies	Least Feasible Strategies
Reading	Partner reading	Explicit teaching of text structure
	Using a book on tape as support	Chunking and questioning aloud (reading mastery)
	Picture-word replacement—use of visuals for words	Relating reading to student experiences
	Specific informal assessments based on curriculum (Curriculum-Based Probe)	Oral sharing on a related topic
	Visualization of a story (draw a scene, plot, etc.)	Tactile vocabulary development steps
Mathematics	Reinforcing math skills through games	Ecological approach/generating data from real life experiences to use in class
	A response journal	Student-developed glossary
	Reciprocal peer tutoring (RPT) to improve math achievement	Daily re-looping of previously learned material
	Explicit vocabulary building and random, recurrent assessments	Use of native language support
	Tactile, concrete experiences of math	Adjusted speech
Science	Peer tutoring	Use of diagrams to teach cause and effect
	Teaching reference skills (e.g., using a glossary)	Graphic organizers such as semantic and conceptual mapping
	Modeling/teacher demonstration	Cross-disciplinary teaching on themes
	Using Venn diagrams	KWL chart
	Use of simplified texts	Hands-on, active participation

For the content area of mathematics, students identified the most feasible instructional strategies to be: reinforcing math skills through games; a response journal; reciprocal peer tutoring (RPT) to improve math achievement; explicit vocabulary building and random, recurrent assessments; and tactile, concrete experiences of math. Students reported that the least feasible mathematics strategies were: ecological approach/generating data from real life experiences to use in class; student-developed glossary; daily re-looping of previously learned material; use of native language support; and adjusted speech.

The following science strategies were reported to be highly feasible: peer tutoring; teaching reference skills (e.g., using a glossary); modeling/teacher demonstration; using Venn diagrams; and using simplified texts. When it comes to the question of the least feasible teaching strategies in science, students indicated the following ones: use of diagrams to teach cause and effect; graphic organizers such as semantic and conceptual mapping; cross-disciplinary teaching on themes; a KWL chart; and hands-on, active participation.

Table 3 shows the most used and least used instructional strategies. When addressing the question of use of reading strategies in their classes, ELL/IEP students selected the following reading strategies as most used: specific informal assessments based on curriculum (Curriculum-Based Probe); journal of the senses; fluency building (high frequency words); literature circle/book club/small group guided discussion; and direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments. The least frequently used reading strategies were: using a book on tape as support; acting out a story; combining kinesthetic and phonemic awareness; chunking and questioning aloud (reading mastery); and fluency building (high frequency words).

Among the mathematics strategies, the following ones were chosen as most used: reinforcing math skills through games; problem solving instruction and task analysis strategies; teacher "think-alouds;" explicit vocabulary building and random, recurrent assessments; and daily re-looping of previously learned material. The least used instructional strategies in mathematics were: ecological approach/generating data from real life experiences to use in class; use of native language support; graphic organizers such as semantic mapping and concept mapping in word problems; adjusted speech; and a response journal.

The following science strategies were selected as most used: pre-teaching vocabulary; summarizing what was learned at end of each lesson (e.g., a journal summary); teaching Greek and Latin prefixes and suffixes; specific informal assessments based on curriculum (Curriculum-Based Probe); and using Venn diagrams. The least used strategies in the content area of science were: graphic organizers such as semantic and conceptual mapping; using pre-reading strategies in content areas; using response cards during instruction to answer teacher questions; using pictures to demonstrate steps; and using simplified texts.

Table 3. Use of Instructional Strategies

Content Area	Most Used Strategies	Least Used Strategies
Reading	Specific informal assessments based on curriculum (Curriculum-Based Probe)	Using a book on tape as support
	Journal of the senses	Acting out a story
	Fluency building (high frequency words)	Combining kinesthetic and phonemic awareness
	Literature circle/book club/small group guided discussion	Chunking and questioning aloud (reading mastery)
	Direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments	Fluency building (high frequency words)
Mathematics	Reinforcing math skills through games	Ecological approach/generating data from real life experiences to use in class
	Problem solving instruction and task analysis strategies	Use of native language support
	Teacher "think-alouds"	Graphic organizers such as semantic mapping and concept mapping in word problems
	Explicit vocabulary building and random, recurrent assessments	Adjusted speech
	Daily re-looping of previously learned material	A response journal
Science	Pre-teaching vocabulary	Graphic organizers such as semantic and conceptual mapping
	Summarizing what was learned at end of each lesson (e.g., a journal summary)	Using pre-reading strategies in content areas
	Teaching Greek and Latin prefixes and suffixes	Using response cards during instruction to answer teacher questions
	Specific informal assessments based on curriculum (Curriculum-Based Probe)	Using pictures to demonstrate steps
	Using Venn diagrams	Use of simplified texts

Importance by Disability

To investigate whether students with different disabilities would weight the importance of teaching strategies differently, the data were analyzed by two disability categories: students with learning disabilities (LD)—64% of the total, and students with other disabilities—36% of the total of study participants. The category of students with other disabilities included such disabilities as speech language impairments, vision impairments, deaf/hearing impairments, or a combination of these disabilities. The purpose of this analysis was to investigate whether the instructional perceptions of LD students and students with other disabilities were different.

Figure 6 demonstrates the results of students' weightings of the importance of the three content areas when analyzed by the category of disability. Both categories of students weighted mathematics the highest, although LD students weighted it slightly lower than students with other disabilities who unanimously selected top weightings for the mathematics content area. The reading importance weightings come next for the two categories with the higher results from the LD category. Science was weighted as the third important subject both by LD students and students with other disabilities; the higher weighting for science came from LD students.

Figure 6. Content Areas by Students' Disability

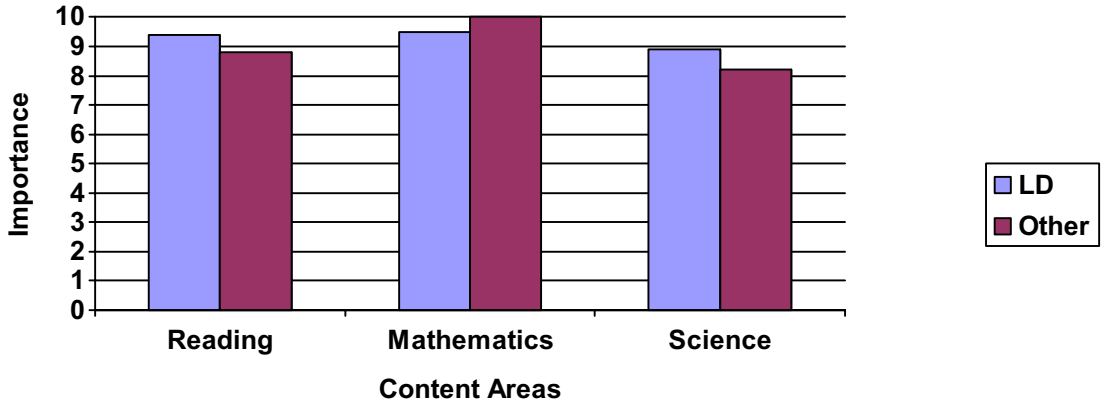


Table 4 summarizes the results of the analysis of the strategy importance by disability category. The top five most important strategies in reading are presented for each disability group. Students with learning disabilities agreed with their peers with other disabilities on the high importance of practicing paraphrasing and retelling. The remaining top instructional strategies differed for the two disability groups in the following ways:

- LD students: fluency building (high frequency words); direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments; specific informal assessments based on curriculum (Curriculum-Based Probe); and cooperative learning

- Students with other disabilities: teaching and using mnemonics; tactile vocabulary development steps; graphic organizers such as semantic mapping, story maps, concept maps; and combining kinesthetic and phonemic awareness

The two disability groups reached the greatest consensus when weighting the importance of mathematics teaching strategies. Both groups agreed on the high importance of the following three mathematics strategies: problem solving instruction and task analysis strategies; reciprocal peer tutoring (RPT) to improve math achievement; and model-lead-test strategy instruction (MLT). The top two remaining strategies for each group were the following:

Table 4. Importance of Instructional Strategies by Students' Disability

Content Area	Top Strategies Weighted by Students with Learning Disabilities	Top Strategies Weighted by Students with Other Disabilities
Reading	Fluency building (high frequency words) (9.0)	Teaching and using mnemonics (9.6)
	Direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments (8.8)	Tactile vocabulary development steps (9.4)
	Specific informal assessments based on curriculum (Curriculum-Based Probe) (8.7)	Graphic organizers such as semantic mapping, story maps, concept maps (9.3)
	Cooperative learning (8.4)	Combining kinesthetic and phonemic awareness (9.2)
	*Practicing paraphrasing and retelling (8.4)**	*Practicing paraphrasing and retelling (9.1)*
Mathematics	*Problem solving instruction and task analysis strategies (9.4)*	*Problem solving instruction and task analysis strategies (9.7)*
	Reinforcing math skills through games (9.3)	*Reciprocal peer tutoring (RPT) to improve math achievement (9.6)*
	Adjusted speech (9.3)	Monitoring of progress through group and individual achievement awareness charts (9.4)
	Reciprocal peer tutoring (RPT) to improve math achievement (9.1)	*Model-lead-test strategy instruction (MLT) (9.3)*
	Model-lead-test strategy instruction (MLT) (9.0)	Explicit vocabulary building and random, recurrent assessments (9.0)
Science	*Pre-teaching vocabulary (8.9)*	*Peer tutoring (9.4)*
	KWL chart (8.9)	Teaching how to pick out the main idea of the text and justify it (9.4)
	Peer tutoring (8.8)	Use of diagrams to teach cause and effect (9.3)
	Using pre-reading strategies in content areas (8.8)	*Pre-teaching vocabulary (9.2)*
	Using visuals (8.8)	Pre-teaching organization of the text/ unit organizers (9.1)

*Strategies in italics were weighted highly by both groups.

- LD students: reinforcing math skills through games and adjusted speech
- Students with other disabilities: monitoring of progress through group and individual achievement awareness charts and explicit vocabulary building and random, recurrent assessments

For the content area of science, the two categories of students agreed on the high importance of pre-teaching vocabulary and peer tutoring. The following strategies were weighted among

the top five most important ones:

- LD students: KWL chart; using pre-reading strategies in content areas; and using visuals
- Students with other disabilities: teaching how to pick out the main idea of the text and justify it; use of diagrams to teach cause and effect; and pre-teaching organization of the text/unit organizers

Importance by Country of Origin. Research participants were born in several different countries—60% of ELL/IEP students were born in the U.S. and 40% of students were born abroad (12% were born in Laos and 28% were born in Thailand). One of the research goals was to find out whether the students would weight the importance of content areas and instructional strategies differently depending on their country of origin. This section describes the results of the comparative analysis.

As Figure 7 suggests, Hmong students with disabilities weighted the content areas of reading, mathematics, and science as important ones. Students generally agreed on content area weightings—mathematics was chosen as the most important content area, reading was chosen next, and science was considered the least important among the three subject areas. However, overall weightings of students born in the U.S. are higher than those of students born in Laos and Thailand. The difference in weightings for reading is 0.8, for mathematics—0.3, and for science—0.9.

Figure 7. Content Areas by Country of Origin

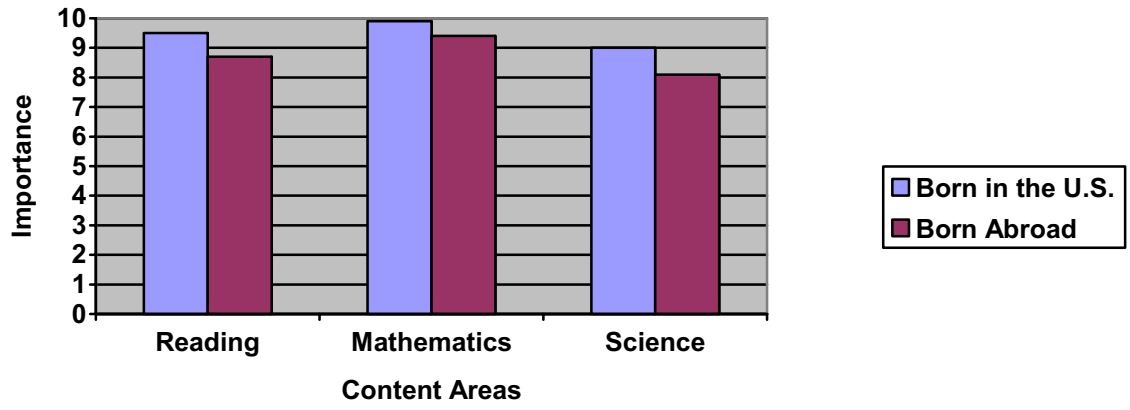


Table 5 shows the top five important reading, mathematics, and science strategies as weighted by Hmong students with disabilities born in the U.S. compared to their counterparts born abroad. For reading strategies, both groups of students agreed on high importance of direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments. The students

Table 5. Importance of Instructional Strategies by Students' Country of Origin

Content Area	Top Strategies Weighted by Students Born in the U.S.	Top Strategies Weighted by Students Born Abroad
Reading	Individual conferencing with the teacher (9.2)	Relating reading to student experiences (9.1)
	Specific informal assessments based on curriculum (Curriculum-Based Probe) (9.1)	Graphic organizers such as semantic mapping, story maps, concept maps (9.0)
	Practicing paraphrasing and retelling (8.9)	*Direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments (9.0)*
	Direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments (8.7)[*]	Combining kinesthetic and phonemic awareness (8.9)
	Chunking and questioning aloud (reading mastery) (8.7)	Fluency building (high frequency words) (8.9)
Mathematics	*Problem solving instruction and task analysis strategies (9.5)*	*Problem solving instruction and task analysis strategies (9.5)*
	Reciprocal peer tutoring (RPT) to improve math achievement (9.4)	*Reciprocal peer tutoring (RPT) to improve math achievement (9.1)*
	Model-lead-test strategy instruction (MLT) (9.2)	*Model-lead-test strategy instruction (MLT) (9.0)*
	Explicit vocabulary building and random, recurrent assessments (9.0)	*Explicit vocabulary building and random, recurrent assessments (9.0)*
	Accelerated or individualized math (9.0)	Monitoring of progress through group and individual achievement awareness charts (8.7)
Science	*Peer tutoring (8.9)*	Using pre-reading strategies in content areas (9.2)
	Pre-teaching vocabulary (8.9)	*Pre-teaching vocabulary (9.2)*
	Teaching how to pick out the main idea of the text and justify it (8.9)	*Peer tutoring (9.2)*
	Using visuals (8.9)	Pre-teaching organization of the text/unit organizers (9.0)
	KWL chart (8.7)	Modeling/teacher demonstration (9.0)

[*]Strategies in italics were weighted highly by both groups.

born in the U.S. also prioritized such reading strategies as individual conferencing with the teacher; specific informal assessments based on curriculum (Curriculum-Based Probe); practicing paraphrasing and retelling; and chunking and questioning aloud (reading mastery). ELL/IEP students born in Laos and Thailand selected the following reading strategies as important ones: relating reading to student experiences; graphic organizers such as semantic mapping, story maps, concept maps; combining kinesthetic and phonemic awareness; and fluency building.

Hmong IEP students reached consensus on the high importance of the following mathematics strategies: problem solving instruction and task analysis strategies; reciprocal peer tutoring

(RPT) to improve math achievement; model-lead-test strategy instruction (MLT); and explicit vocabulary building and random, recurrent assessments. The fifth most important strategy was accelerated or individualized math for the students born in the U.S. and monitoring of progress through group and individual achievement awareness charts for the students born in Laos and Thailand.

All research participants agreed to the high importance of such science strategies as peer tutoring and pre-teaching vocabulary. Yet, the remaining top science strategies were different for the two comparison groups. Students born in the U.S. weighted highly teaching how to pick out the main idea of the text and justify it; using visuals; and a KWL chart. Their counterparts who were born in Laos and Thailand gave high weightings to using pre-reading strategies in content areas; pre-teaching organization of the text/unit organizers; and modeling/teacher demonstration.

Discussion

Findings from this study may have implications for delivering grade-level, standards-based instruction to ELL/IEP students in general education settings. Students in the research sample were predominantly those in grades 5–8 with the age range of 10–14 years old. Students' perspectives on importance, feasibility, and use of content areas and instructional strategies can give educators insight into strategies that students value. Such strategies may be more successful at helping ELL/IEP students achieve grade-level content standards.

Data from this study show that the three content areas included in the study ranked in the following order of their importance starting from the highest: mathematics, reading, science. Research shows that Hmong students are similar to other Asian students who have been labeled as "the model minority," they achieve higher average mathematics scores than average verbal scores (Barrozo, 1987). Study participants demonstrated genuine interest in all three content areas with a greater emphasis on mathematics. According to one of the students, "Math is important because you can know your numbers and learn… Math is easy." Another student suggested that all the three content areas were equally important: "When you grow up, you need to know these things for a job and stuff you do."

Two factors may account for the higher mathematics importance weightings as compared to the other two content areas. First, the emphasis on mathematics is higher in Asia. Therefore, students born abroad may value mathematics more than other subject areas. In Figure 7, the gap of average importance weightings between mathematics and the two other content areas is higher for students born abroad than for students born in the U.S. Second, mathematics curriculum does not require as much proficiency in English as other content areas.

The study participants gave relatively high average weightings to the proposed reading, mathematics, and science instructional strategies. All the strategy average weightings were distributed in the upper level of the importance, feasibility, and use continua. From the set of the reading instructional strategies, the curriculum-based probe (CBP) was weighted by the ELL/IEP students as highly important, highly feasible, and frequently used. The CBP process involves having students read aloud three basal reader passages for one minute; the teacher marks the place where the student stops and then asks comprehension questions and continues to give probes until the student reaches a frustration level as defined by reading rate and median score. King-Sears (1994) uses the mnemonic APPLY to organize the CBP process:

1. Analyze the curriculum;
2. Prepare items to match curriculum objectives;
3. Probe frequently;
4. Load data using a graph format;
5. Yield to results—revise.

Two other strategies—direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments and fluency building (using high frequency words)—were reported as highly important and frequently used. These two strategies encompass learning new vocabulary units and practicing them frequently through short assessments and exercises.

As weighted by students, two of the less important strategies (acting out a story and oral sharing on a related topic) involve class group activities. Acting out a story is also among the five least frequently used strategies, whereas oral sharing on a related topic is among the five least feasible strategies. Using a book on tape is one of the less important and less frequently used strategies, even though it was regarded as highly feasible.

Among the 19 instructional strategies for mathematics, ELL/IEP students selected explicit vocabulary building and random, recurrent assessments as highly important, highly feasible, and frequently used. This strategy requires using brief assessments to help students build basic subject-specific vocabulary and also to gauge student retention of subject-specific vocabulary.

Among the other mathematics strategies, the problem solving instruction and task analysis strategy was weighted as one of the most important and most used, and reciprocal peer tutoring to improve math achievement was weighted as one of the most important and most feasible. Reinforcing math skills through games was reported to be one of the most feasible and most frequently used strategies.

The following mathematics strategies received lower weightings from students: daily re-looping of previously learned material (lower importance and feasibility); ecological approach/generating data from real life experience to use in class (lower importance and feasibility); use of a response journal (lower importance and use); use of native language support (lower feasibility and use); and use of adjusted speech (lower feasibility and use).

Several science instructional strategies were weighted highly on more than one criterion. Peer tutoring received high weightings of its importance and feasibility, the pre-teaching vocabulary strategy was weighted highly in terms of importance and use, and using Venn diagrams was reported to have high feasibility and frequent use. Peer tutoring, which was also weighted highly for mathematics, assumes having students working in pairs with one student tutoring the other on a particular concept.

Some science strategies coincided in their low weightings of importance, feasibility, and use. The graphic organizers (semantic and conceptual mapping) strategy was given lower weightings on all the three criteria. Use of diagrams to teach cause and effect was considered less important and feasible. Use of response cards during instruction to answer teacher questions was classified as less important and less frequently used.

Research on ELL/IEP students tends to treat them as one group with uniform needs. Data analysis by categories suggests, however, that students with different disabilities and origin have different instructional needs. Of the three sets of teaching strategies, research participants agreed on high importance of only one reading strategy—practicing paraphrasing and retelling. The remaining reading strategies were different for LD students and students with other disabilities. LD students put an emphasis on verbal strategies, such as fluency building and Curriculum-Based Probe, whereas students with other disabilities selected several strategies involving audio-visual aids as highly important, e.g., graphic organizers such as semantic mapping, story maps, concept maps and combining kinesthetic and phonemic awareness. Both disability groups agreed on high importance of three top mathematics strategies. The remaining two top strategies for LD students were playing math games and teachers' changes in speech patterns. Their peers with other disabilities highly weighted strategies related to assessment. Three out of five top science strategies were different for the two disability groups. Students with LD highly weighted the KWL chart strategy, using pre-reading strategies in content areas, and using visuals. Students with other disabilities prioritized teaching how to pick out the main idea and justify it, using diagrams to teach cause and effect, and pre-teaching organization of the text/unit organizers.

Data analysis by students' country of origin showed some differences between students born in the U.S. and abroad. Mathematics strategies are characterized by the greatest consensus—four out of five strategies with the highest importance coincided for students born in the U.S. and those born in Laos and Thailand. From the set of the reading strategies, only one of them (direct

teaching of vocabulary through listening, seeing, reading, and writing in short time segments) was chosen as highly important by both categories of students. Students born in the U.S. seemed to emphasize individualized approaches (e.g., individual conferencing with the teacher), whereas students born abroad preferred audio-visual-based and vocabulary-based techniques (e.g., graphic organizers such as semantic mapping, story maps, concept maps; fluency building). Students born in the U.S. and students born abroad agreed on the high importance of peer tutoring and pre-teaching vocabulary in science. Yet, students born in the U.S. prioritized visual strategies (e.g., using visuals) while their counterparts from Laos and Thailand selected reading-based strategies (e.g., using pre-reading strategies in content areas; pre-teaching organization of the text/unit organizers) as highly important ones.

There are several limitations to the study. One of them was the lack of student interaction during the MACB procedure since much of the time was allotted to the process of explaining and weighting the strategies. Also, students were asked to comment on the feasibility of the strategies from the standpoint of their teachers. The decision to keep this question was based on the researchers' desire to be consistent with the previous teacher study methodology (Thurlow, et al., 2004).

Overall, the study findings suggest that ELL/IEP students have opinions about instructional strategies. This suggests that they can contribute to their education and should be part of the decision-making process. The students' insights on the importance, feasibility, and use of content areas and instructional strategies should be taken into account in standards-based education. Further research on instructional strategies needs to be carried out in order to satisfy ELL/IEP students' educational needs in the best possible way.

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Appendix A

Instructional Strategies

Reading

Strategy	Explanation for Students	Strategy Definition
1. Graphic organizers such as semantic mapping, story maps, concept maps	Using story maps	Visual displays to organize information into things like trees, flowcharts, webs, etc.; they help students to consolidate information into a meaningful whole and they are used to improve comprehension of stories, organization of writing, and understanding of difficult concepts in word problems
2. Cooperative learning	Team (cooperative) learning	A range of team based learning approaches where students work together to complete a task
3. Practicing paraphrasing and retelling	Using your own words to describe what you read	Working on specific skills to orally retell or summarize what happened in a story
4. Relating reading to student experiences	Reading what you know from your own life	Having students talk about connections in the reading to their own experiences; sharing in a large group or small group setting; using group experiences to better understand reading
5. Prediction	Predicting what is going to happen in a story	Having students predict what is going to happen in a story based on a title, headline, illustration, or initial sentence/paragraph
6. Visualization of a story (draw a scene, plot, etc.)	Drawing a scene of a story	Having the students draw a scene of a story, the plot, etc., to demonstrate student comprehension of the story or to have students organize ideas; may encourage students who have strong artistic talent, but emerging reading skills
7. Acting out a story	Students act out a part of a story	Having the students act out a part of a story; using physical movement to demonstrate and improve comprehension of the story; could also be used on a smaller scale with puppets, etc., but includes physical movement of some sort
8. Literature circle/ book club/small group guided discussion	Literature circle/book club/other group reading activities	Students discuss portions of books in a small group; sometimes roles are assigned for group interaction; students at varying levels are able to share different points about the book
9. Individual conferencing with the teacher	Practicing your reading with a teacher	Listening to a student read, talking about a book, reading every other paragraph, one-on-one during independent reading time; time to bond with a student; opportunity to record informal assessments about a student's progress in reading

Strategy	Explanation for Students	Strategy Definition
10. Oral sharing on a related topic	Whole class discussion of the general topic for the reading	Students share their written or prepared responses with the class so that students can share their answers to prompts with the class, but have had time to prepare them
11. Partner reading	Reading with a partner	Having students work together in pairs to read a text to each other and discover the main ideas of the story
12. Using a book on tape as support	Using books on tape	Using books on tape to enhance reading development in some way; having students use the tapes to go over the story after partner reading, to make sure they have not missed a vocabulary word, etc.
13. Repeated reading	Reading the same text many times	The method of having students read passages orally three times in a row and each time try to achieve a faster speed and fewer disfluencies; if comprehension is being targeted, students answer some different comprehension questions after each reading or retell the story
14. Picture-word replacement—use of visuals for words	Using pictures for words	Replacing key vocabulary words of a text with pictures and then adding the words back in, and also bringing in visuals of key vocabulary words in a text
15. Use of organized pre-assessment strategies (e.g., KWL)	Doing activities before reading to find out what you already know about the topic	Pointing out and getting students to discover the different parts of the text that can be used in learning: captions, headings, etc.; also familiarizing the students with the layout of the text, glossary, etc., beforehand
16. Direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments	Learning key words through listening, seeing, reading, or writing	Teaching vocabulary directly through listening, speaking, reading, and writing each used in short blocks of time; students are exposed to vocabulary in different ways and movement of activities helps hold attention
17. Specific informal assessments based on curriculum (Curriculum-Based Probe)	Taking timed oral reading tests	Having students read aloud three basal reader passages for 1 minute; teacher marks the place where the student stops and then asks comprehension questions and continues to give probes until students reach frustration level as defined by reading rate and median score
18. Tactile vocabulary development steps	Using objects to help students write words	Using three-dimensional or tactile objects to help in developing students' abilities to write words and letters (e.g., writing letters in sand or tracing wood block letters)
19. Recurrent, random vocabulary assessment	Taking tests on words that you already learned	Recycling vocabulary words that have been discussed in class and randomly choosing words from this list to have random assessments on so as to reinforce the already "learned" vocabulary words

Strategy	Explanation for Students	Strategy Definition
20. Teaching and using mnemonics	Using letter combinations to help you remember words (for example, ROY G. BIV for colors in rainbow)	Association techniques used to help students remember some aspect of reading; for example, associating a list of irregular verbs with each of the letters in a familiar name
21. Combining kinesthetic and phonemic awareness	Using moves to help you learn letters (for example, YMCA)	Associating different movements with phonemes to anchor sounds during practice drills in order to build phonemic awareness and remembering of sounds by the students
22. Think-alouds used with reading	Thinking aloud to tell yourself how you are reading	Using explicit explanations of the steps of problem solving through teacher modeling metacognitive thought; for example, reading a story aloud and stopping at points to think aloud about reading strategies/processes
23. Fluency building (high frequency words)	Practicing words until you know them well	Helping students build fluency in frequently occurring words through short assessments and exercises that give increased exposure to high-frequency words
24. Journal of the senses	Using a journal to write what story characters see, smell, taste, or feel	Having students write down in an informal way (possibly even a form to fill in) what they imagine the characters in a story would see, smell, hear, taste, and feel at a certain point in the story
25. Use of decodable text	Using readings that have only words that you know	Using readings that contain only words the students can decode and build on that; decoding is the ability to translate a word from print to speech, usually by employing knowledge of sound-symbol correspondences; also, the act of deciphering a new word by sounding it out
26. Explicit teaching of text structure	Learning how the text is organized (for example, headings give you the main idea)	Teaching the parts of different types of text and making sure students understand the text structure before reading; this would include basics such as text in English is read from left to right, and also more sophisticated structures such as the structure of a fairy tale
27. Chunking and questioning aloud (reading mastery)	Reading a story in blocks (chunks) and answering questions about what you understand	The process of reading a story aloud to a group of students and stopping after certain blocks of text to ask the students specific questions about their comprehension of the story and some key features of the text

Mathematics

Strategy	Explanation for Students	Strategy Definition
1. Reciprocal peer tutoring (RPT) to improve math achievement	Working on math problems with a partner	Having students pair, choose a team goal to work toward, tutor each other on math problems, and then individually work a sheet of drill problems; students get points for correct problems and work toward a goal
2. Graphic organizers such as semantic mapping and concept mapping in word problems	Using pictures and maps	Visual displays to organize information into things like trees, flowcharts, webs, etc.; they help students to consolidate information into meaningful whole and they are used to improve comprehension of stories, organization of writing, and understanding of difficult concepts in word problems
3. Tactile, concrete experiences of math	Using different objects to form geometric shapes	Using three dimensional objects in math instruction such as geometrical shapes, coins, or blocks used to form various geometrical shapes
4. Daily re-looping of previously learned material	Daily repeating what you learned before	A process of always bringing in previously learned material to build on each day so that students have a base knowledge to start with and so that learned structures are constantly reinforced
5. Ecological approach/ generating data from real life experiences to use in class	Solving math problems that relate to your own life	The approach involves all aspects of a child's life, including classroom, family, neighborhood, and community, in teaching the child useful life and educational skills
6. Students generate word problems	Making up your own word problems	Having students create word problems for a specific math skill; through the construction of a problem, the students learn what to look for when solving word problems they are assigned
7. A response journal	Using a journal to record your answers and how you solve problems	Students record in a journal what they learned that day or strategies they learned or questions they have; students can share their ideas in the class, with partners, and with the teacher
8. Use of native language support	Learning math in your first language	Providing auditory or written content input to students in their native language
9. Specific informal assessments based on curriculum (Curriculum-Based Probe)	Doing sets of timed math problems	Having students solve 2–3 sheets of problems in a set amount of time assessing the same skill; teacher counts the number of correctly written digits, finds the median correct digits per minute and then determines whether the student is at frustration, instructional, or mastery level

Strategy	Explanation for Students	Strategy Definition
10. Student-developed glossary	Writing your own list of math terms (glossary or dictionary)	Students keep track of key content and concept words and define them in a log or series of worksheets that they keep with their text to refer to
11. Reinforcing math skills through games	Playing math games	Using games to follow-up a lesson in order to reinforce learned skills and use the skills in another context
12. Teacher "think-alouds"	The teacher thinks aloud about how to solve a problem	Using explicit explanations of the steps of problem solving through teacher modeling metacognitive thought; for example, demonstrating the thought process used in problem solving
13. Explicit vocabulary building and random, recurrent assessments	Taking a test on math words you already learned	Using brief assessments to help students build basic subject-specific vocabulary and also gauge student retention of subject-specific vocabulary
14. Problem solving instruction and task analysis strategies	Learning the steps to solve math problems	Explicit instruction in the steps to solving a mathematical or science problem including understanding the question, identifying relevant and irrelevant information, choosing a plan to solve the problem, solving it, and checking answers
15. Monitoring of progress through group and individual achievement awareness charts	Using progress charts for your group or for yourself to see how much you have learned over time	Using charts to build awareness and motivation of progress for students; the emphasis here is on progress so even students working at different levels can chart significant gains
16. Model-lead-test strategy instruction (MLT)	The teacher shows you how to solve a problem, and then you practice and do tests on similar problems	3-stage process for teaching students to independently use learning strategies: 1) teacher models correct use of strategy; 2) teacher leads students to practice correct use; 3) teacher tests students' independent use of it; once students attain a score of 80% correct on two consecutive tests, instruction on the strategy stops
17. Adjusted speech	The teacher slows down or repeats in her own words what she is saying	Teacher changes speech patterns to increase student comprehension; includes facing the students, paraphrasing often, clearly indicating most important ideas, limiting asides, etc.
18. Accelerated or individualized math	Doing your math work at your own pace and passing tests after each unit	A system of having students work at different levels individually in one classroom; they progress by passing tests for each unit and move at their own pace
19. Student "think-alouds"	Thinking aloud to tell yourself how you are solving math problems	Using explicit explanations of the steps of problem solving through teacher modeling metacognitive thought

Science

Strategy	Explanation for Students	Strategy Definition
1. Specific informal assessments based on curriculum (Curriculum-Based Probe)	Doing 30-minute seat work to practice science problems	Having students read aloud three basal reader passages for 1 minute; teacher marks the place where the student stops and then asks comprehension questions and continues to give probes until students reach frustration level as defined by reading rate and median score
2. Graphic organizers such as semantic and conceptual mapping	Using charts in the shape of trees, webs, and other objects	Visual displays to organize information into things like trees, flowcharts, webs, etc.; they help students to consolidate information into meaningful whole and they are used to improve comprehension of stories, organization of writing, and understanding of difficult concepts in word problems
3. Peer tutoring	Working on science problems with a partner	Having students work in pairs with one student tutoring the other student on a particular concept
4. Using short segments (5 minutes) to teach vocabulary directly	Learning science words for 5 minutes in class through listening, seeing, reading, and writing	Teaching specific science vocabulary for a short period before a lesson through listening, seeing, reading, and writing
5. Using response cards during instruction to answer teacher questions	Writing brief answers to your teacher's questions on cards	Having students write brief answers to teacher questions on cards; teacher asks a question and all students hold up cards; teacher can scan answers of all students for understanding; sometimes cards just have "yes" or "no" on them and can also be prepared by the teacher
6. Hands-on, active participation	Participating actively in a project or experiment	Designing activities so that students are actively involved in the project or experiment; hands-on participation is as important as verbal participation in the activity
7. Cooperative learning (high with low grouping)	Team (cooperative) learning	A range of team-based learning approaches where students work together to complete a task
8. Pre-teaching organization of the text/ unit organizers	Discovering parts of the text that can help you learn (for example, headings, captions)	Pointing out and getting students to discover the different parts of the text that can be used in learning: captions, headings, etc.; also familiarizing the students with the layout of the text, glossary, etc., beforehand
9. Modeling/teacher demonstration	Your teacher demonstrates how to do an experiment before you do it	Teacher demonstrates how to do a lab or experiment before having the students try it on their own

Strategy	Explanation for Students	Strategy Definition
10. Using visuals	Using pictures, objects, and charts	Bringing two- or three-dimensional visuals into the classroom to enhance teacher instruction in the content area
11. Pre-teaching vocabulary	Learning science words before the science lesson	Teaching key vocabulary words prior to working with the lesson or unit
12. Using pre-reading strategies in content areas	Discussing main ideas and connecting them to your life before the science lesson	Giving overview of unit, previewing main ideas, connecting subject to the background knowledge of the students, etc.
13. Summarizing what was learned at end of each lesson (e.g., a journal summary)	Summarizing what you learned at end of each lesson (for example, journal summary)	Having a summarizing activity as to what was learned in each lesson (e.g., having students summarize in their journals what was learned each day)
14. Cross-disciplinary teaching on themes	Learning similar words and themes in different classes (for example, in reading and science)	Teaching similar vocabulary and themes in different classes (e.g., doing a reading on wolves in reading class while doing a unit on wolves in biology class)
15. Teaching how to pick out the main idea of the text and justify it	Learning how to pick out the main idea of the text	Teaching students how to pick out the main idea of a paragraph or reading and explain why it is the main idea; done as a class or in small groups to build consensus of what the main idea is
16. Use of simplified texts	Using texts that are easy to read	Using science texts that have simplified language for ELL students
17. Using pictures to demonstrate steps	Using pictures to demonstrate steps	Using a series of pictures to demonstrate the steps in a project or experiment so that students get a visual image of what they need to do
18. KWL chart	Doing activities before a science lesson to find out what you already know about the topic	Know, want to know, learned, routine; a form of self-monitoring where students are taught to list what they know already about a subject, what they want to know, and later what they learned
19. Using Venn diagrams	Using charts with overlapping circles to show commonalities between two things	Use of interconnected circles to demonstrate how different subjects or topics overlap and how they are unique
20. Teaching Greek and Latin prefixes and suffixes	Learning Greek and Latin prefixes and suffixes	Teaching prefixes and suffixes since students will encounter them often, especially in with science content vocabulary
21. Teaching reference skills (e.g., using a glossary)	Learning how to use science glossaries and dictionaries	Teaching students how to use reference items, dictionary, glossary, etc. for a certain type of text (like science)

Strategy	Explanation for Students	Strategy Definition
22. Collecting anonymous student-generated questions	Writing your questions on a piece of paper without your name on it and giving them to the teacher	During, or at the end of a lesson, having students write any questions that they might have on a card; collecting the cards and answer the questions without identifying a student; students might be more willing to ask questions they have anonymously, instead of in front of their peers
23. Use of diagrams to teach cause and effect	Using diagrams to demonstrate cause and effect	Using diagrams (e.g., fishbone diagrams) to demonstrate the relationship of cause and effect

Appendix B

Content Area and Instructional Strategy Weightings

Content Areas

Content Area	Minimum Weighting	Maximum Weighting	Standard Deviation	Mean
Reading	5.00	10.00	1.31	9.16
Mathematics	8.00	10.00	.56	9.68
Science	4.00	10.00	1.85	8.64

Reading

Strategy	Minimum Weighting	Maximum Weighting	Standard Deviation	Mean
1. Graphic organizers such as semantic mapping, story maps, concept maps	1.00	10.00	2.18	8.36
2. Cooperative learning	5.00	10.00	1.66	8.40
3. Practicing paraphrasing and retelling	6.00	10.00	1.41	8.68
4. Relating reading to student experiences	3.00	10.00	1.71	8.40
5. Prediction	1.00	10.00	2.43	7.32
6. Visualization of a story (draw a scene, plot, etc.)	1.00	10.00	2.58	7.52
7. Acting out a story	1.00	10.00	2.10	7.08
8. Literature circle/book club/small group guided discussion	1.00	10.00	2.14	7.92
9. Individual conferencing with the teacher	1.00	10.00	2.69	8.36
10. Oral sharing on a related topic	1.00	10.00	2.32	7.28
11. Partner reading	1.00	10.00	2.79	7.84
12. Using a book on tape as support	1.00	10.00	2.49	6.52
13. Repeated reading	2.00	10.00	2.27	7.68
14. Picture-word replacement—use of visuals for words	1.00	10.00	2.69	7.64
15. Use of organized pre-assessment strategies (e.g., KWL)	5.00	10.00	1.76	8.20
16. Direct teaching of vocabulary through listening, seeing, reading, and writing in short time segments	5.00	10.00	1.34	8.84
17. Specific informal assessments based on curriculum (Curriculum-Based Probe)	5.00	10.00	1.55	8.80
18. Tactile vocabulary development steps	2.00	10.00	1.78	8.64

Strategy	Minimum Weighting	Maximum Weighting	Standard Deviation	Mean
19. Recurrent, random vocabulary assessment	5.00	10.00	1.31	8.28
20. Teaching and using mnemonics	5.00	10.00	1.65	8.32
21. Combining kinesthetic and phonemic awareness	3.00	10.00	1.83	8.52
22. Think-alouds used with reading	1.00	10.00	1.94	8.00
23. Fluency building (high frequency words)	5.00	10.00	1.27	8.76
24. Journal of the senses	1.00	10.00	2.63	7.68
25. Use of decodable text	1.00	10.00	2.45	7.92
26. Explicit teaching of text structure	1.00	10.00	2.28	7.76
27. Chunking and questioning aloud (reading mastery)	1.00	10.00	2.29	8.40

Mathematics

Strategy	Minimum Weighting	Maximum Weighting	Standard Deviation	Mean
1. Reciprocal peer tutoring (RPT) to improve math achievement	5.00	10.00	1.21	9.28
2. Graphic organizers such as semantic mapping and concept mapping in word problems	1.00	10.00	2.28	8.04
3. Tactile, concrete experiences of math	1.00	10.00	2.63	7.76
4. Daily re-looping of previously learned material	1.00	10.00	2.58	7.44
5. Ecological approach/generating data from real life experiences to use in class	1.00	10.00	2.82	7.52
6. Students generate word problems	1.00	10.00	3.15	7.36
7. A response journal	1.00	10.00	2.14	7.64
8. Use of native language support	1.00	10.00	2.47	7.96
9. Specific informal assessments based on curriculum (Curriculum-Based Probe)	1.00	10.00	2.13	8.12
10. Student-developed glossary	3.00	10.00	1.93	7.96
11. Reinforcing math skills through games	1.00	10.00	2.99	8.52
12. Teacher “think-alouds”	2.00	10.00	2.38	8.40
13. Explicit vocabulary building and random, recurrent assessments	5.00	10.00	1.50	9.00
14. Problem solving instruction and task analysis strategies	6.00	10.00	1.00	9.48
15. Monitoring of progress through group and individual achievement awareness charts	6.00	10.00	1.22	8.68
16. Model-lead-test strategy instruction (MLT)	7.00	10.00	.93	9.12

Strategy	Minimum Weighting	Maximum Weighting	Standard Deviation	Mean
17. Adjusted speech	1.00	10.00	2.26	8.56
18. Accelerated or individualized math	1.00	10.00	2.20	8.44
19. Student “think-alouds”	1.00	10.00	2.35	8.44

Science

Strategy	Minimum Weighting	Maximum Weighting	Standard Deviation	Mean
1. Specific informal assessments based on curriculum (Curriculum-Based Probe)	1.00	10.00	2.26	7.76
2. Graphic organizers such as semantic and conceptual mapping	1.00	10.00	2.17	7.96
3. Peer tutoring	5.00	10.00	1.21	9.04
4. Using short segments (5 minutes) to teach vocabulary directly	1.00	10.00	2.10	8.20
5. Using response cards during instruction to answer teacher questions	1.00	10.00	2.24	7.24
6. Hands-on, active participation	1.00	10.00	2.06	8.48
7. Cooperative learning (high with low grouping)	1.00	10.00	2.25	8.40
8. Pre-teaching organization of the text/unit organizers	4.00	10.00	1.55	8.64
9. Modeling/teacher demonstration	5.00	10.00	1.28	8.72
10. Using visuals	3.00	10.00	1.59	8.88
11. Pre-teaching vocabulary	7.00	10.00	1.06	9.04
12. Using pre-reading strategies in content areas	1.00	10.00	1.78	8.52
13. Summarizing what was learned at end of each lesson (e.g., a journal summary)	5.00	10.00	1.33	8.52
14. Cross-disciplinary teaching on themes	5.00	10.00	1.39	8.44
15. Teaching how to pick out the main idea of the text and justify it	4.00	10.00	1.45	8.88
16. Use of simplified texts	5.00	10.00	1.45	8.56
17. Using pictures to demonstrate steps	4.00	10.00	1.69	8.24
18. KWL chart	5.00	10.00	1.53	8.80
19. Using Venn diagrams	4.00	10.00	1.54	8.12
20. Teaching Greek and Latin prefixes and suffixes	5.00	10.00	1.50	8.44
21. Teaching reference skills (e.g., using a glossary)	6.00	10.00	1.29	8.28

Strategy	Minimum Weighting	Maximum Weighting	Standard Deviation	Mean
22. Collecting anonymous student-generated questions	1.00	10.00	2.57	8.20
23. Use of diagrams to teach cause and effect	2.00	10.00	2.07	8.12