# Access to the General Education Curriculum: Research-Based Interventions for High School Students with Disabilities

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presented by:

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**Ms. Johnson:** Hello, good afternoon, and welcome to "Access to the General Education Curriculum: Research-Based Interventions for High School Students with Disabilities." I am Donna Johnson, Project Coordinator with the National Center on Secondary Education and Transition at the University of Minnesota. I would like to extend a special welcome to our Exiting TA Community of Practice members. Today we are pleased to have Dr. Jean Schumaker as our presenter.

Dr. Schumaker is Associate Director of the University of Kansas Center for Research on Learning and Professor in the Department of Human Development and Special Education. She received her Ph.D. at the University of Kansas in developmental and child psychology in 1976. She has spent the last 25 years studying the problems of adolescents and developing educational interventions for them. Along with Dr. Donald Deshler and other colleagues at the Center for Research on Learning, she has developed the Strategies Intervention Model, a comprehensive program for students with learning disabilities. Dr. Schumaker is an author of the Learning Strategies curriculum, a curriculum comprised of 15 student learning strategies; Social Skills for Daily Living, Assets, and Cooperative Strategy Theories, which are three social skills curricula; eight manuals in the Content Enhancement series, a series developed to improve the delivery of content in mainstream classrooms; and numerous articles and chapters. We are very pleased to have Dr. Schumaker present for us today. So, now I will turn it over to Dr. Schumaker; thanks, Jean.

**Dr. Schumaker:** Thank you, Donna, and welcome, everyone. [1] I am going to be talking today about the Institute for Academic Access, which was a grant funded by the U.S. Office of Special Education Programs. [2] This particular project at the University of Kansas was to create real access to the high school general education curriculum for students with disabilities. Basically, what we were about was improving educational outcomes achieved by students with disabilities. [3] The research partners involved were people in Oregon like Doug Carnine and Betsy Davis and as well as people at the University of Kansas like Keith Lenz, Don Deshler, Jan Bulgren, and myself. [4] The target population was high school students with disabilities—they had been formally classified as having a disability by their schools. They were students who are expected to earn the standard high school diplomas, because we wanted to look at students who potentially could be enrolled in the general education curriculum. They either had been enrolled in a rigorous general education course, they could have been enrolled in a rigorous general education course, or they could have been enrolled in a rigorous general education course if the proper support had been available to them.

[5] The model that we used involved four strands of research.

1. We began with descriptive research where we were looking at, "What is the education like that these students with disabilities are receiving?"
2. Then we went to student learning research where we focused on interventions that could help students.
3. Then we moved to teacher learning research where we were looking at professional development experiences and the components of those experiences that yielded implementation of new instructional programs.
4. Now we are working on school change research where we are working with whole schools, trying to help them understand the kinds of programs that they need to put in place to train their teachers and actually effect change at the whole-school level.

The arrows on that graphic device there show that the data gathered about each strand inform the other strands of research and that all strands are ongoing.

[6] One thing that we knew going into this project was that students with disabilities in junior and senior high schools reach a plateau in their achievement. This

*Superscript numbers refer to refer to the slide of the accompanying PowerPoint being discussed.*

figure labeled "Achievement Gap" shows with the blue line what we would expect students to achieve; that is, we would expect a first grade student to achieve at least one year in—second grade level and we are talking about the average second grade or third grade student all the way up through this blue line on the chart. The red line, on the other hand, represents what students with disabilities look like—that is, their growth is slower, they reach about the 4th grade level and then they plateau off when they are in 7th grade. So in other words, we have the 4th grade hump there. For example, in reading, students with disabilities would be reading on average at the 4th grade level when they hit 7th grade and they don't improve after that. So we knew that was the case going into this project and we wanted to take a look at what their education looked like.

[7] We went into the classes that they were enrolled in. First, we took a look at what their general education teachers were doing. This figure shows the main percentage of intervals that the general education teachers were observed in various activities in eight high schools. We went into four different types of general education teacher classes—science, social studies, English, and math—in each school and we observed what percentage of the time were they involved in instructional activities, what percentage of the time were non-instructional activities, and what percentage of the time were research-based activities. As you can see by the chart, there was a lot of variability in terms of the percentage of instructional time across schools, but that averaged around 60% in most of the schools. One school had as high as 89% of the teachers involved in instruction, which is quite high. You will also see that there were no research-based intervals, that means that we did not observe any teacher using research-based instructional materials or methods—curricula, for example.

[8] The next chart shows the main percentage of intervals with general education teachers were observed in actual instructional practices. We took a look at typical instructional practices that you would expect teachers to be using like lecturing or reading aloud, giving directions, etc. We also looked at activities such as monitoring, giving a model or demonstration, having the students verbally rehearse using simple enhancers, content enhancement devices, and so forth, which are research-based methods that we now use with students with disabilities. So you can see, most of the time the teachers were lecturing or reading aloud or giving directions and there were very few observations of teacher use of research-based instructional methods.

[9] The next figure shows the main percentage of intervals the special education teachers were observed

in various activities in the different schools. And there were six high schools that were observed here. You can see in half of the schools there were more intervals where the teachers were not involved in instruction than when they were involved in instruction. And only one school was using any research-based material: their curricula for students with disabilities.

[10] Again we looked at the special education teachers and the particular instruction methods they were using, and their profile looks very similar to the general education teachers which was surprising to us—you will see that they again used very few models: verbal rehearsals, simple enhancers, etc., can give much elaborate feedback or describing skills or strategies to the students.

[11] We took a look at the different course options that were available for special education students.

- Type B were courses taught by general education teachers for low achievers and…students, they were specifically designed to be a kind of low-track/watered-down course.
- Type C were rigorous courses taught by general education teachers that had genius groups of students enrolled; that is, they had students with disabilities, low achievers, no achievers, and high achievers in those courses and of course our thought was that we wanted to see students with disabilities in Type C courses.
- Type D were the Advanced Placement courses taught by general education teachers.
- Type E were other courses taught by general education teachers like…electives and other kinds of electives.

What we found was that in most of the schools (five) there were type A courses, a few of the high schools had type B courses, only two of the high schools had Type C classes, and only one of those high schools had a written policy that specified that all students with disabilities who were in the track for the standard high school diploma would be enrolled in Type C classes....On Type C classes they call them regular general education courses.

[12] The next figure shows the actual numbers of enrollments of students with disabilities in the nine high schools that we studied. On the first line you will see the total number of special education students in each of the schools, for example in (Royal) School there were 48 special education students. The next row shows the total possible core class enrollments—we took the numbers of students and multiplied that times four, because we wanted to see them in English, social studies, science, and math courses. And so there were 192 possible core class enrollments for (Royal) School special education

students. However, the actual number of rigorous general education enrollments was 15 for that school. So, in other words, out of 48 students only 15 classes—of those 48 students—only a few of them were enrolled in—actually 15—in the total of 15 general education classes. And then, we asked the teachers to estimate the number of students with disabilities in their classes. And so that last line shows you their estimates, which were pretty inaccurate.

[13] The next screen shows you kind of a summary of these data. The total possible rigorous class enrollments was more than 3,000. The actual number was about 682. The total numbers of students with disabilities was 805 and the estimates for the number of students was 205.

[14] With regard to student achievement, we looked at the student grade point averages, and we found that the students' grades were C and below. A majority of students were getting D's and after the grade point averages were in the D and F range. And this is interesting given the fact that most of them were in watered-down courses or in general education courses taught by special education teachers. And what these courses look like were, for example, in English class, where 9th grade, 10th grade, 11th grade, and 12th grade students were all in the classroom together, working individually on different English activities related to the code/encode course they were taking.

[15] The next slide shows our model for ensuring access and positive outcomes for students with disabilities. You will see that in the triangle that there are three major program components. We have learner-friendly courses, those are Type C courses where students are taught using research-based methods in English, social studies, science, and math. There is skills or strategies instruction where students learn strategies for approaching the demands of their courses, and there is homework assistance for students who need help studying for tests and completing their homework. As you can see, we used some formative evaluation tools, developed benchmark assessments that can be given to students on a regular basis to determine their progress. The final outcomes that we are shooting for are success in Type C courses, high school graduation, passing scores on the state assessments, and enrollment in postsecondary education.

[16] The Content Literacy Continuum is kind of our way of looking at what happens in the whole school across a wide variety of classes to enhance the instruction for students with disabilities.

- At Level I, we have enhanced content instruction in those learner-friendly courses, like English, science, social studies, and math.
- In Level II, we have embedded-strategy instruction in those rigorous courses—that is, the strategies

instruction is woven within and across classes by the teachers in a coordinative fashion.
- At Level III, we have intensive strategy instruction. That's where those students who need additional help and more practice receive intensive strategy instruction and perhaps a support setting such as a research course or a special class designed for teaching strategies.
- Level IV is intensive basic skill instruction—that's where students who are reading at the 1st, 2nd, and 3rd grade levels, for example, receive instruction in phonetic skills or specialized reading programs are used to help them learn those skills.
- Level V is therapeutic intervention for students who have severe language problems and need perhaps the attention of speech-language therapist. After school course, that's where the homework assistance comes in or it could be before school and we have a special method called strategic tutoring.

I will be telling you more about each of the interventions that's used at the different levels in a couple of minutes. So that was very descriptive research.

[17] Let's take a look at student learning research studies and what we have been doing in that area. [18] So, let's just take a look at learner-friendly courses. We have developed a whole set of routines called the Content Enhancement Routine that are used to make subject area courses learner-friendly. [19] For example, if we want to compare two concepts like the concept of an evergreen tree and dizygous tree, we can use a routine called the Concept Comparison Routine. [20] This routine is a set of research-based methods that teachers can use in their class to create a comparison table, which is shown on the screen here. We call this comparison table a visual device that the teacher uses. The teacher puts the blank device up on the overhead projector and students have a blank device at their desks. And the teachers, through an interactive process and a series of steps called the Concept Comparison Routine, create this comparison table in partnership with the students. You will see here with the two concepts being compared are plot and theme, which are two elements of literature. And what the teacher does is ask the students questions to come up with the characteristics of plot and the characteristics of theme. And then they come up with characteristics that are similar and different across the two concepts and talk further about that and summarize it.

[21] What we have found is, that when we use the Concept Comparison Routine—see the data graph here—different types of students, students with learning disabilities, low achievers, normal achievers, and high achievers do better than if we don't use the Concept

Comparison Routine. All these students, for example, fail their unit tests when they receive information comparing two concepts. However, when the Concept Comparison Routine is used they get an average of 70%. [22] We will move on to the next slide, which is the Concept Anchoring Table. This is another visual device; it's used with the Concept Anchoring Routine. You will see the fractional parts—which is the new concept—is being related to parts of a pizza. [23] When this device is used, basically what we are doing here, if you look at the next screen with the picture of the boat—we are anchoring new information to information that's already known by the students. They may not understand fractions but they do understand parts of a pizza. We are trying to anchor the new information to what they already know through the use of this visual device, the Concept Anchoring Table. [24] When we did our study, we had two concepts that we were using: one was called Pyramid of Numbers and the other was Commensalism, both were complex concepts that we were teaching the students. We had two groups of students. And in condition one, one of the groups had Pyramid of Numbers with the Concept Anchoring Routine and the other group had Commensalism without Concept Anchoring Routine. And then we flip-flopped the groups so that the Pyramid of Numbers was not in—the routine was not used with Pyramid of Numbers and then the routine was used with Commensalism. [25] If you look at the graph, it shows that with learning disabled students, low achievers, normal achievers, and high achievers in just about every case, when the concept was enhanced with the routine, the students did better. So, for example, when Pyramid of Numbers was enhanced, you see that the students with learning disabilities earned a mean score of 69%, whereas when it wasn't, they earned a mean score of 36%.

[26] The Recall Enhancement Routine is another routine we use to help students remember what they are learning. We had two groups, an experimental group and a control group, and we had two groups of facts that they were learning, non-reviewed facts and reviewed facts. At the end of the lecture, some of the facts were reviewed and some of the facts were not reviewed. And there were two types of reviews, one set of facts was reviewed just by repeating them again and the second set of facts was reviewed by using the Recall Enhancement Routine. And the Recall Enhancement Routine was a co-construction process between the teachers and the students creating memory devices for remembering the information.

[27] You will see in the next graph that the students with learning disabilities, when the routine was not used or when the facts were just repeated, received an average score of 41%, whereas when the Recall Enhancement Routine was used they received a score of 70% on average, so from an F to a C grade. [28] The next figure shows the percentage of students performing at passing levels—it shows that on the non-reviewed facts, the control and experimental students were just about the same on the non-reviewed facts. However, when we take a look at the reviewed facts on the right-hand side of the screen, we see that it makes a huge difference, only 11% of the students with learning disabilities received the passing grade in the control condition whereas 77% received a passing grade in the experimental condition—when the Recall Enhancement Routine was used.

The next few slides just show some of the different visual devices that go with some of our other routines. [29] For example, the first one here is our Exploration Guide which goes with our Question Exploration Routine where a critical question is asked and then the class analyses that critical question, unpacks it into smaller parts, and comes up with a main idea answer. [30] And we also have a Course Organizer Routine for launching courses and a Course Organizer Device. [31] We have a Frame Device for framing a key topic and main ideas and details related to that topic and several others—we have about 15 different routines and visual devices that go with those routines and we have done studies on all of them.

[32] We have also done a series of studies on learning strategy instruction. [33] Our learning strategies curriculum has three strands:

1. the acquisition strand, which is basically reading strand;
2. the storage strand, which is the strand for studying for tests; and
3. the expression strand, which is the strand for demonstrating what you know by either writing about it or by taking tests and completing assignments.

[34] "Learning strategy" as we have defined it is a set of steps that a person uses to plan, act, and evaluate his or her performance on a task and its outcomes. [35] For example, if you receive an assignment to list the political leaders of the Soviet Union from 1917 to the fall of communism, how are you going to remember those? [36] We have designed the strategy to help the students retain that information and it's called The First Letter in Pneumonic Strategy. The steps are shown here on the screen: the student can go through the series of little memory devices and choose one of them. In this case, the student would choose the fourth device called "shape a sentence" and come up with sentence like "Little Soviet Kids Become Adult Citizens Gradually."

[37] The Sentence Writing Strategy is another strategy that's in the expression strand. Students pick one of 14 different formulas that they learn, they explore words to fit the formula, they note the words, and then they search and check—that means that they search for the verbs and subjects making sure that it's a complete sentence and they check that they have a capital letter, period at the end, and that it makes sense. [38] You see here some data showing that before students go into the sentence writing strategy they write about 70% complete sentences; after they learn the strategy 99% of their sentences on the average are complete.

[39] The Paragraph Writing Strategy—you see the steps here and [40] data showing that in baseline students earn about 36% of the points on their paragraph and after instruction they earned 80%. All of these data derive from multiple baselines across the students graph, they are just summarized here.

[41] The Error Monitoring Strategy is a set of steps students use to find their errors in their writing. [42] In the pre-test they could only find and correct 25% of their errors and in the post-test—after instruction—they could correct 90% of their errors. [43] In baseline, the mean number of errors per word was about 0.27, which is about one error for every three or four words, and then after instruction they had less than one error in every 20 words.

[44] The Theme Writing Strategy is shown here and this is the strategy that students use to write long papers. [45] Before instruction they earn about 24% of the points on their themes and after instruction about 74%. [46] For a group of students who had learned all the writing strategies, in the district competency writing test, they earned an average score of 3.5, whereas all students in the district earned an average score of 2.5.

[47] The next graph shows what happened when we taught the Theme Writing Strategy to underprepared students at the University of Kansas. These were students whose ACT scores were around 17. After learning the Theme Writing Strategy, their average score or grade was 2.5, which is a C/C+ in their English classes at KU. And other students who were prepared—these were students whose ACTs were around or above 25—earned average grades of 2.6 and they earned a grade of 2 or C for the underprepared students and 2.5 for the prepared students.

[48] Homework Assistance through Strategic Tutoring: [49] we have a strategic tutoring process that includes four instructional phases. [50] Our model for strategic tutoring involves explaining the content and building knowledge in the subject area that the students are studying, sharing extensive knowledge of strategies that is the tutor is an expert in, and an apprenticeship relationship with the student that shows the student how to be a good learner. The tutor applies the principles of strategic instruction in the phases while also mentoring the student and connecting with the student, giving the student a connection to the school.

[51] This graph on the next slide shows the data from three students during baseline and after strategic tutoring. You will see that their test scores and their quizzes for the period of time during baseline are first shown and then to the right of that you will see their test and quiz scores after or during strategic tutoring. And in all cases the students' grades raised from F in baseline or low D's to C's and B's on average. [52] In another study, the students' scores again raised from F's to B's on their tests and quizzes. And in the pretest they only earned 15% of the points available and on the posttest they earned 85%.

[53] We have also taken a look at how can we enhance the way teachers learn, with the Teacher Learning Studies. [54] Some of these routines that I showed you earlier like the Concept Comparison Routine, the Concept Anchoring Routine—what we call Enhancement Routines—as well as the Concept Mastery Routine are represented on this graph. [55] Next graph, when we train the teachers, we gave them workshops and we observed them in their classes before and after the workshop. [56] You will see in the yellow bars the percentage of instructional procedures that they used that were associated with routines before they participated in a workshop, and then in the red bars you will see the percentage of behaviors they performed after the workshop and you will see that in each case the teachers were performing at least 90% of behaviors that they were taught to perform.

[57] We find that to enhance our ability to teach teachers about new methods, first we have pretty much discarded the traditional approach, which is an inservice training session on an inservice day. We find that these stand-and-deliver kinds of activities don't yield much in the way of the fidelity of implementations. We work with teachers before the workshop, giving them interviews to find out what's going on in the school. We use partnership learning methods where we involve teachers in choosing what they want to learn about and we go into classes and model, we maybe have support team meetings, we have onsite instructional coaches in some schools where they collaborate with the teachers on an ongoing basis. What we find is that if we use this enlightened approach, we get about half of the teachers implementing our routine or strategy, but with the instructional coaches added to the enlightened approach, then we get more than 80% of the teachers implementing. Our staff development activities we find are more effective, the more instructional methods we

put into place in a school. This table shows that when we present information, when we model it, when we have practice activities where we go into the classrooms and coach, the teachers learn 90% of the information—that is, they are knowledgeable about the innovations. When we observe them in the classes using the innovation, they implement about 90% of the methods and also when we observe them in the workshop they implement about 90%. So we see really good gains when we put in as many of these instructional methods as we can.

Another thing that we are doing in the area of professional development is developing professional development CDs (we call them virtual workshops) where teachers can attend the workshop via their computer—they put the CD into their computer and it tells them all about a routine. [58] For example, the routine that's featured here in this slide is the Concept Anchoring Routine and the different lessons that are depicted on the next few slides show what we tell the teachers about the Anchoring Table, different parts of the Anchoring Table, the instructional steps that they are going to be using, [59] called the linking steps in lesson two and then [60] in lesson three, we tell them about the Cue-Do-Review Sequence which is the overall instructional sequence that they use with routines. [61] Then in lesson four we show them different teachers using the routine at the elementary, middle school, and high school levels, so they can see that all different kinds of teachers can use the routine with all different kinds or subjects like science and social studies and English and math. And then in lesson five, which isn't shown here, we show them a wide variety of example tables, anchoring tables that teachers have developed for different subject areas. In each of these lessons, there are video clips of teachers using the routines so they can actually see how it's done in the classroom and see the students responding to and working in partnership with the teachers. [62] And there are activities like in lesson six where they create their own Anchoring Tables and they can kind of check their work through an interactive activity process.

[63] The results of these virtual workshops are very similar to the results of actual workshops or live workshops—what we find is the teachers in both groups, the actual workshop group and the virtual workshop groups, perform about 15% of the routine before they go to the workshop or use the CD and then afterwards they perform about 80% of the routine. So they are both pretty effective and they look pretty equally effective. [64] With regard to knowledge, the same thing is true—teachers in both groups are able to earn average scores of about 80% on written tests of their knowledge of the routine. [65] We also gave the teachers a test where they had to

create an Anchoring Table and both groups were equally effective in doing that, they earned about 98% of the points available after the instruction. [66] And when we take a look at their students, we found that the students of the virtual workshop teachers actually performed better than the students of the actual workshop teachers. They earned average scores of about 70% on a written test vs. about 54% by the actual workshop group after the teachers started using the routine. [67] This next figure shows that the students with learning disabilities, the virtual workshop group students performed better than the actual workshop group students.

[68] Our School-Change Research has taken us to a new level where we are going into schools and working with the faculty to put into place the different levels of the continuum that I talked to you about earlier. If you recall, the first level was learner-friendly courses, the second level was embedded-strategy instruction, third level was intensive-strategy instruction, etc. What we have done is a variety of studies in different high schools where we have put some of these interventions in place and I'm going to show you some graphs now that depict the data from those studies. [69] The first graph shows the effects of using several different Content Enhancement Routines. In a general education economics class at the 10th grade level at Muskegon High School, what we found there was that we could use the students in the economics classes in the year 2000-01 as our control group. The students with disabilities earned average test scores across the whole school year of 53%—failing grades, basically—whereas the other students in the classes earned an average score of 71%. The next year, when the teacher used Content Enhancement Routines, students with disabilities earned average scores of 68% and students without disabilities earned scores of about 80%. And those are scores across the whole school year, all their unit tests.

[70] This next figure shows 9th grade physical science classes. It's a slightly different study—here the teachers taught half of the units without Content Enhancement, that's represented in the blue bars, and half of the units with content enhancement, represented in the red bars. These scores show the unit test scores, average scores for students with disabilities, without disabilities, and the whole group. Before or in the units where Content Enhancement was not used, students were getting average scores in the 60% range whereas after or when Content Enhancement was used with particular units, students were getting average of scores in the 70% range. [71] The next figure shows the same students, but we are taking a look here at sub-groups of students in the 9th grade physical science classes. We are taking a look at the students

who were getting B's in the units where they did not use Content Enhancement Routines and students who were getting C's or who were failing. As you can see, the failing students are the ones who benefit the most from the use of the Content Enhancement Routines (the red bars), but the other groups did benefit as well.

[72] This next figure shows a study we did in a district where 1,000 students were taught the Sentence Writing Strategy, it shows that before the instruction 66% of their sentences were complete sentences and after the instruction 93% of the sentences were complete sentences. Before the instruction 9% of their sentences were complicated sentences, after the instruction 45% of their sentences were complicated sentences, so their sentences that are compound, complex sentences.

[73] This next figure shows in a high school that where the English teachers were teaching Sentence Writing Strategy in 9th grade, the Paragraph Writing Strategy in 10th grade, and the Error Monitoring Strategy in 11th grade. The percentage of students that passed the state writing competency exam—this was an inner-city school—and the red bar shows the percentage of students in each of three years who passed the writing competency exam, it's in the 90% range for each year. The blue bar shows 12 comparable schools and their percentage of students that were passing the state competency exam in writing. The yellow lines show the percentage of students passing in Michigan middle cities and then the blue line shows all of Michigan. So you see some ranges there but you also see that this inner-city school is outperforming all of the other comparison groups.

[74] Self-Questioning Strategy is a strategy that where students have white boards and then the teacher prompts them to think of a question related to the subject area they are studying and then they have to think of predictions that are related to their questions. [75] When a teacher in 7th grade science taught the Self-Questioning Strategy to his students and then gave a pretest before the unit began and a posttest after the unit, the students who did not learn the Self-Questioning Strategy gained an average of 40 percentage points from the pretest to the posttest and students who did learn the strategy gained an average of 60 points from the pretest to the posttest.

[76] The Word Identification Strategy is a strategy we teach students who are reading at the 4th grade level, so that they are able to dissect or decode just about any multisyllabic word that they encounter in their textbooks. [77] We have had a class at Muskegon High School for seven years now—the data for those seven years are represented in this figure. We tested all the 9th graders coming into the high school. Any student who was two or more

years below grade level in decoding was placed into a special class to learn the Word Identification Strategy. This figure shows that most of the groups of students each year were reading on average about the 5th or 6th grade level in this group. After the instruction they are reading at about the 8th/9th grade level, which meant they gained about three to four grade levels in reading by participating in this class. The class lasted for 4-6 weeks depending on the students' progress. [78] This next figure shows the data from the LD student sub-groups and again we are getting nice gains on the part of those students.

We also had a group of students who were scoring two or more years below grade level in reading comprehension. The graph I just showed you was reading decoding. [79] This next graph shows reading comprehension. We put the students into a reading comprehension class that lasted one semester and we had a comparison school with similar types of students who were matched to our students in reading. [80] At the beginning of the study, the students in the comparison schools were reading at about 6th grade level. After the instruction students came to about one year in reading comprehension after a semester of the instruction and reading comprehension strategies.

[81] This next figure shows the data for just responders—the students who actually did better on the posttest than they did on the pretest. What we found was quite good group of students, probably about a third of our students didn't do very well on the posttest and in fact they did worse on the posttest than they did on the pretest. So we just wanted to look at the responders to take a look at how much they were gaining. As you can see across five semesters—the first group of students came in reading about the 5th grade level and they finished their reading at about the 8th grade level. So the students who were actually serious about taking the posttest showed us that they were making some pretty nice gains. These data on this next graph from Chase Middle School and… show the skill levels in reading competency and the state reading competency exam for the last three years—the blue is three years ago, yellow is two years ago, red is last year—and it shows the different categories of student scores, the unsatisfactory scores, the basic score, the proficient, advanced, and exemplary. What we are seeing over time is, as we instituted the reading comprehension instruction, we are seeing fewer students in the unsatisfactory and basic levels and more students in the proficient, advanced, and exemplary levels.

[82] This next figure shows a 7th grade class in Maryland and they are instituting the learner-friendly classes in the strategy instruction in their school. And you will see here in 2000-01 the scores for reading, writing,

and math and also special education. You will see that the scores are 0% and the special education student, so they are the students with disabilities. 2001-02, it looks about the same but we are getting a little higher score in writing and math. Special education has now showed up on the screen. And then in 2002-03, we are seeing an increase in all of the scores for the general students and the special education students, we're seeing them performing at the 90% level in reading, writing, and math.

[83] So to conclude: what we found is that if we put validated instructional practices in place by ensuring the fidelity of implementation through excellent professional development with teachers and we also ensure coordinated implementation by the teachers across the different levels, we also ensure that we have strong administrative leadership and coaching and other quality professional development—we put all these things together, we can improve the outcomes for students with disabilities, we can ensure that they have access to rigorous general education courses. We can ensure that they get passing grades on their tests and we can ensure that basically they are just doing better in school and feeling better about themselves and receiving high-quality education. [84] Thank you very much. Do you have any questions?

**Ms. Johnson:** So, is there anyone who has a question to ask? Well, Jean, I have a question for you. Are you working with very many colleges' and universities' teacher preparation programs to implement some of these strategies?

**Dr. Schumaker:** Well, for years we have had summer workshops for professors. We have a national network of professional developers, now is about 1500 people strong. And I would say about a third of the network are individuals who teach courses at universities and teacher training institutions across the nation. And they include the interventions that we have developed in their courses. On the whole, they don't necessarily train teachers to implement this whole package like I have described it to you. Their courses are typically filled with lots of information and they just really don't have enough time to cover all of the interventions that I have described to you.

**Ms. Johnson:** Okay. Any other questions for Jean? Well, thanks, Jean for sharing the information with us. Jean's contact information is available at *http://www. kucrl.org/* and I would like to again thank Jean for sharing her time and experience with us. And if you are interested in our next teleconference, we are having one on August 19, which is Thursday, at 1:00 Central Time and the topic is "Promising Practices in Supporting Student Development of Self-determination Skills." So thanks again and thanks everyone for joining us today.

*This teleconference was coordinated by the National Center on Secondary Education and Transition. This transcript is copyright free. Please duplicate and share with others.*

**Contact us at:**
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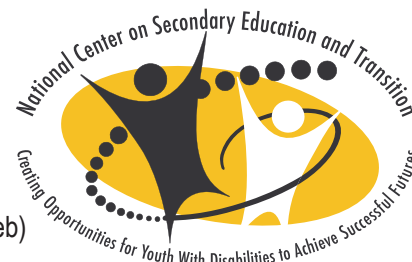
# Institute for Academic Access

University of Kansas

# Purpose of the IAA

- Creating real access to the high school general education curriculum for students with disabilities (SWDs)

- Improving educational outcomes achieved by SWDs

# Research Partners

**Planning Team**
Keith Lenz
Gary Adams

**Materials &
Assessment Team**
Doug Carnine
Bonnie Grossen
Betsy Davis

**Instructional
Methods Team**
Don Deshler
Jean Schumaker
Janis Bulgren
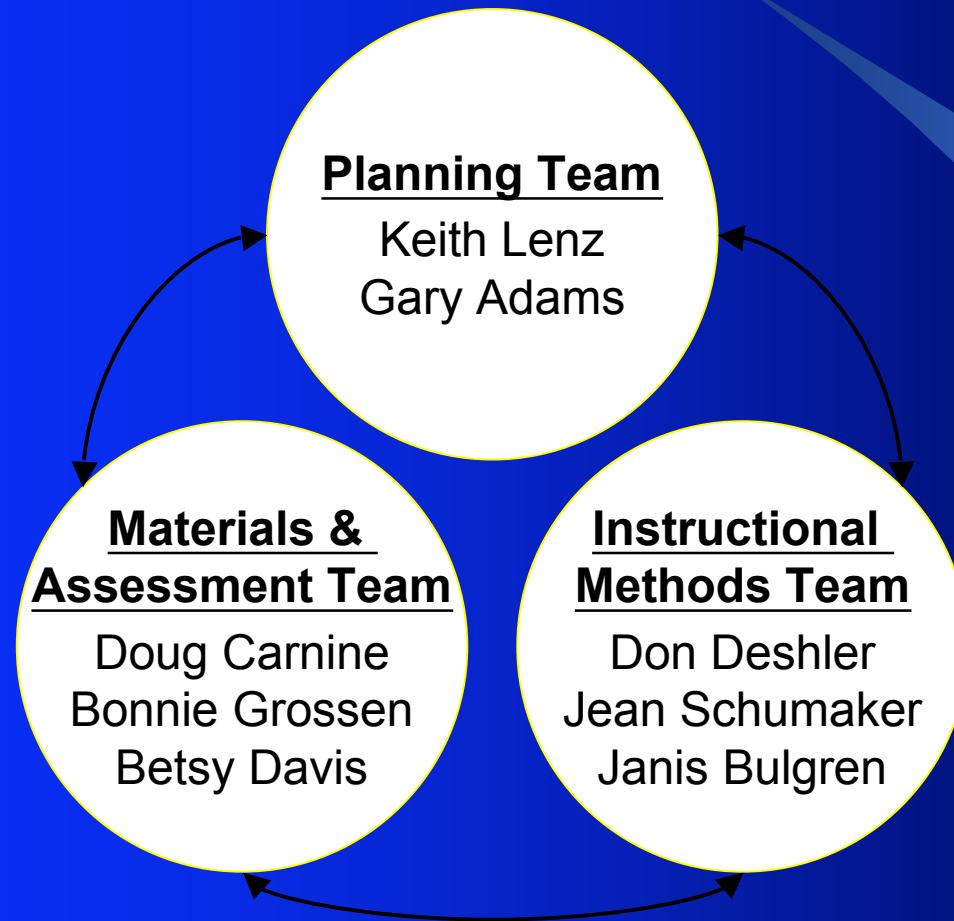
# Target Population

- High-school students with disabilities (SWDs) who:
  - Have been formally classified
  - Are expected to earn standard high school diplomas
  - Are or have been enrolled in a rigorous general education curriculum

    Or

  - Could be enrolled in a rigorous general education curriculum if support were available

# Interactive Research Model



| Strands | Project Years | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | n |
| I: Descriptive Research on Contextual Factors | | | | | | |
| II: Student-Learning Research | | | | | | |
| III: Teacher-Learning Research | | | | | | |
| IV: School-Change Research | | | | | | |

# Achievement Gap

# Mean Percentage of Intervals General Education Teachers Were Observed in Various Activities for Each School



General Education Teacher Observation Interval Type

# Mean Percentage of Intervals General Education Teachers Were Observed in Various Activities



**General Education Teacher Observation**

1. Lecture/read
2. Give directions
3. Listening
4. Ask question
5. Monitor
6. Model
7. Verbal rehearsal
8. Simple enhancer
9. Advance organizer
10. Role Play
11. Content Enhancement (complex)
12. Elaborated Feedback
13. Write on board
14. Describe skill/strategy

# Mean Percentage of Intervals Special Education Teachers Were Observed in Various Activities for Each School
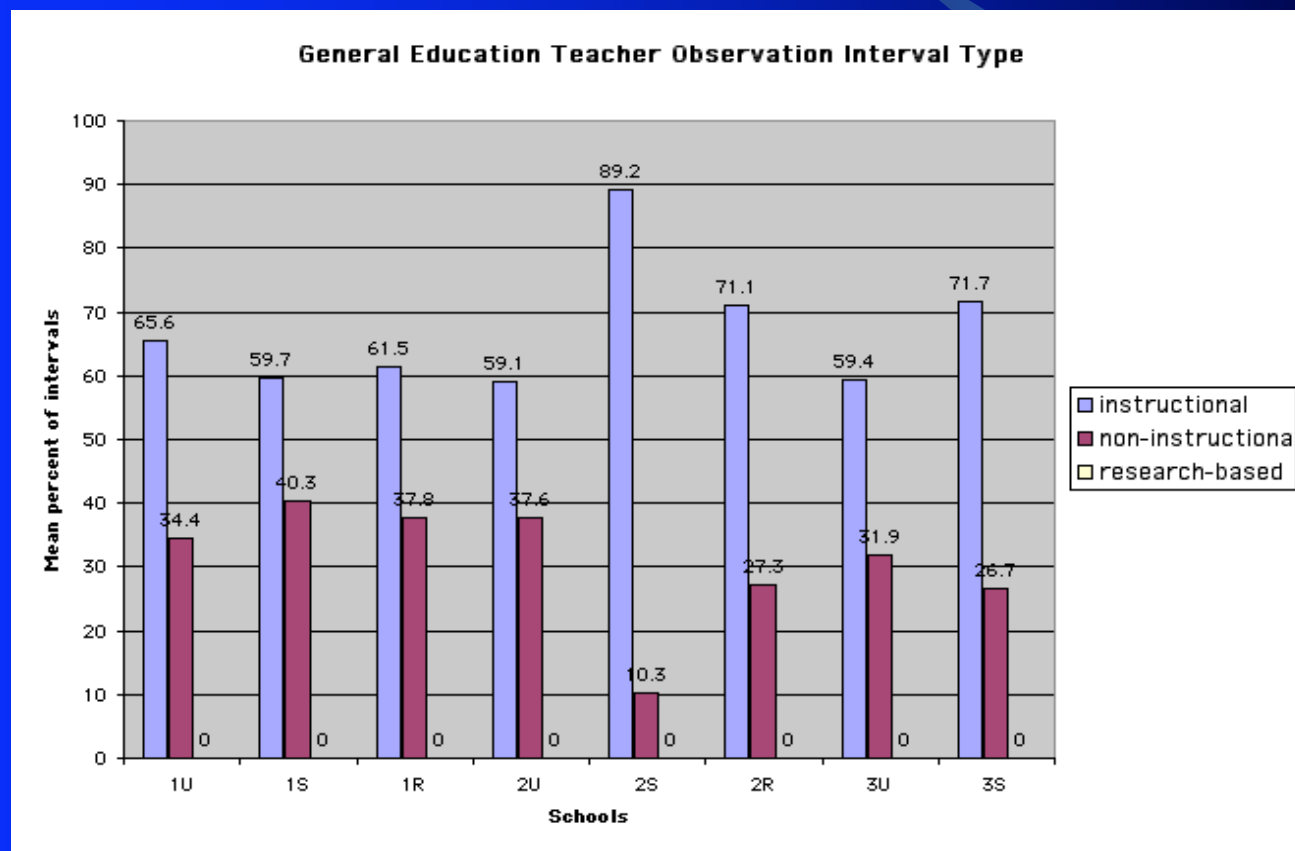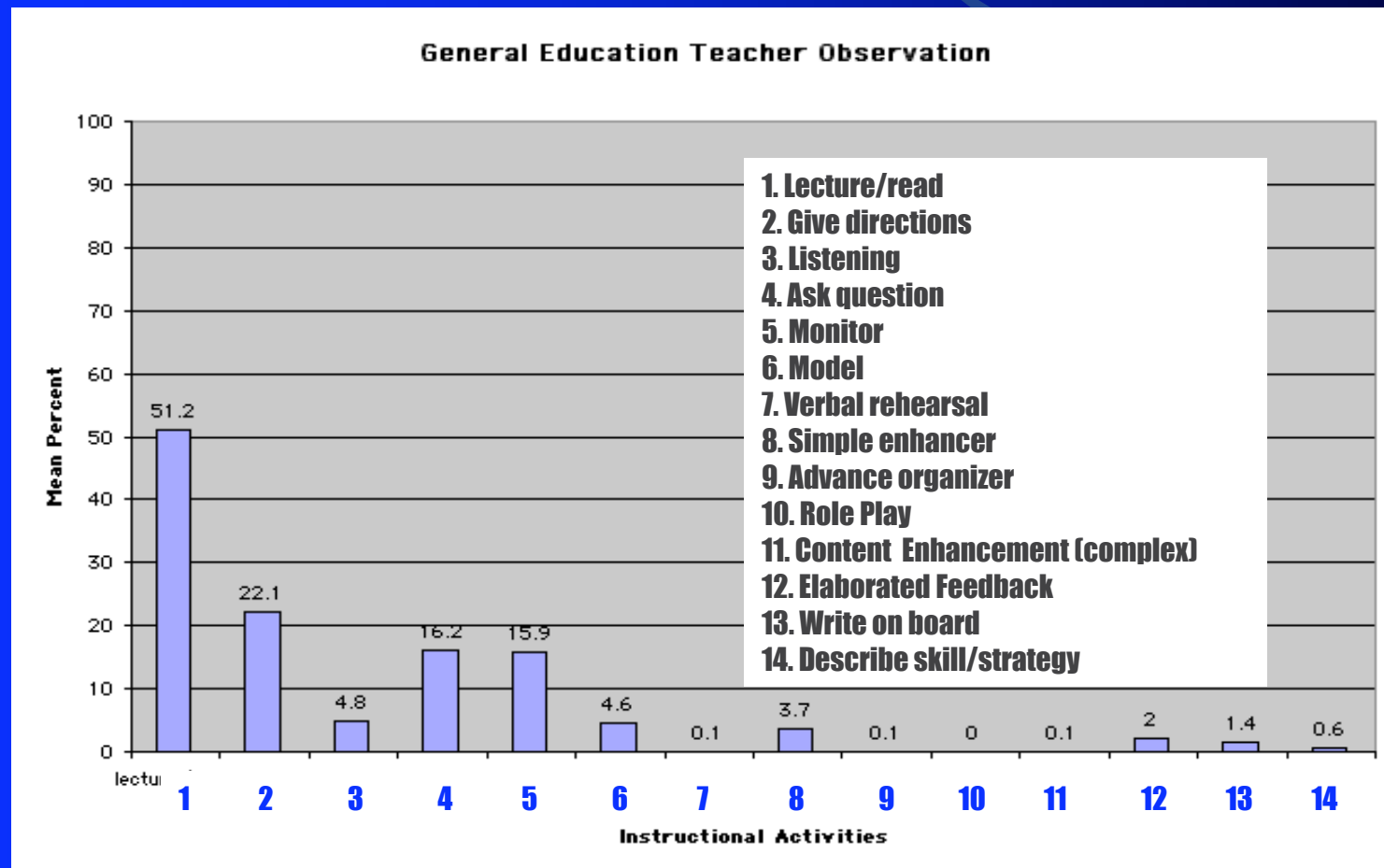


Mean percentage of intervals special education teachers were observed in various activities for each school.

# Special Education Teacher Observations



Special Education Teacher Observations

1. Lecture/read
2. Give directions
3. Listening
4. Ask question
5. Monitor
6. Model
7. Verbal rehearsal
8. Simple enhancer
9. Advance organizer
10. Role Play
11. Content Enhancement (complex)
12. Elaborated Feedback
13. Write on board
14. Describe skill/strategy

Mean percent of intervals

50.7 | 14.3 | 43.6 | 13.6 | 23.3 | 0.6 | 0 | 0.4 | 0 | 0 | 0 | 2.2 | 2.4 | 0.2

1  2  3  4  5  6  7  8  9  10  11  12  13  14
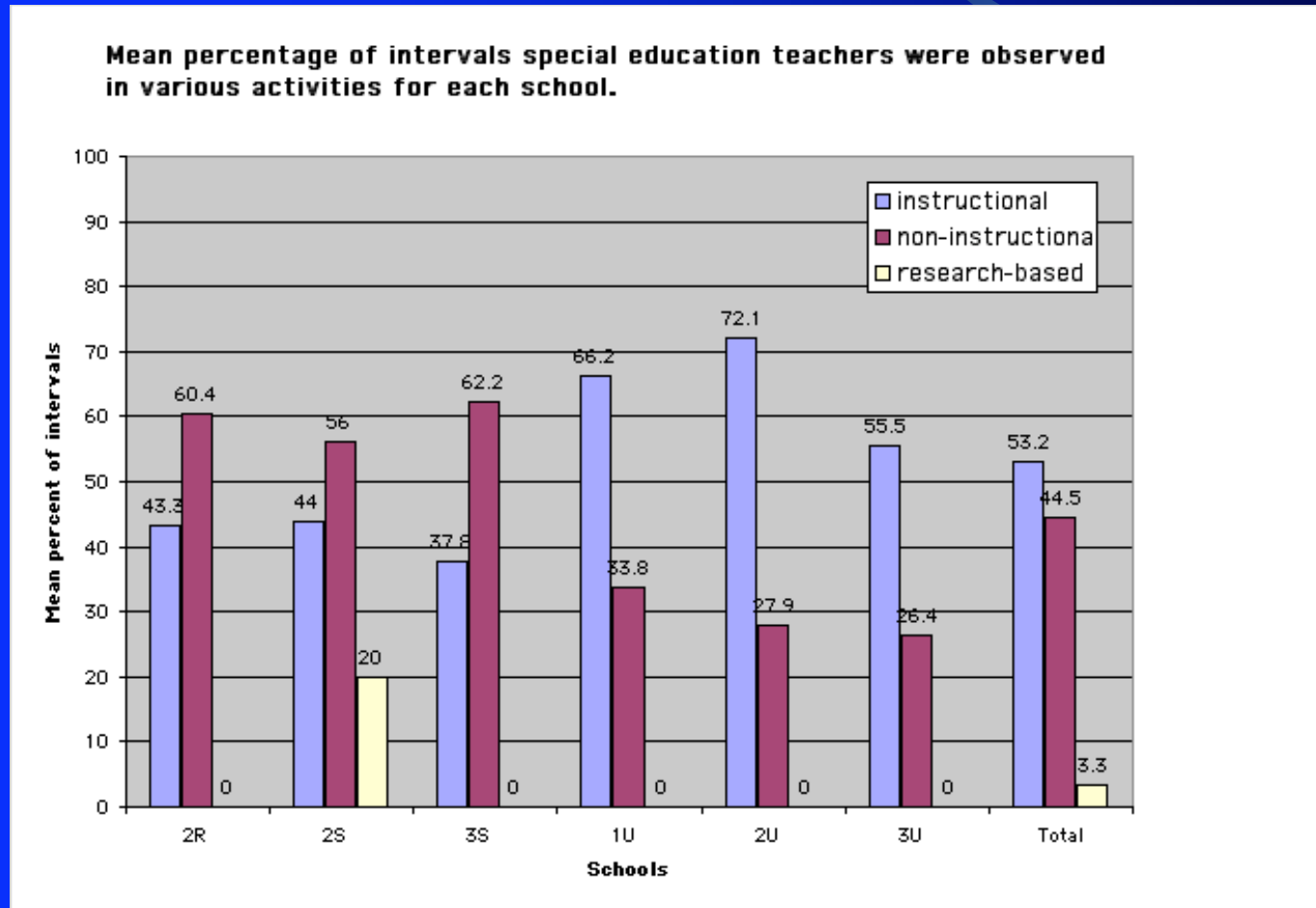
Instructional Activities

# Course Options for SWDs

- **Type** A: Courses taught by SPED teachers for SPED students
- Type B: Courses taught by general education teachers for low achievers and at-risk students

- Type C: Rigorous courses taught by general education teachers with heterogeneous groups of students
- Type D: Advanced placement courses taught by general education teachers
- Type E: Other courses taught by general education teachers (e.g., vo-tech electives)

# Rigorous General Education Enrollments for SWDs

*Rigorous general education enrollments for students with disabilities.*

|  | Rural Schools | | | Suburban Schools | | | Urban Schools | | |
|---|---|---|---|---|---|---|---|---|---|
|  | 1R | 2R | 3R | 1S | 2S | 3S | 1U | 2U | 3U |
| Total number of special education students | 48 | 14 | 50 | 62 | 76 | 67 | 89 | 180 | 219 |
| Total possible core class enrollments [1] | 192 | 56 | 200 | 248 | 304 | 268 | 356 | 720 | 876 |
| Actual number of rigorous general education enrollments | 15 | 49 | 6 | 35 | 304 | 67 | 4 | 166 | 36 |
| Estimated number of students with disabilities by general education teachers | 55 | 24 | N/A[2] | 24 | 17 | 21 | 13 | 51 | N/A |

[1] This number reflects the number of enrollments possible if every student with a disability were enrolled in a rigorous general education class each class period of the day

[2] N/A=not available.

# Enrollments in "Rigorous" General Education Classes

- Total possible "rigorous" class enrollments:
  3220
- Actual # of "rigorous" enrollments:     682

- Total # of SWD:                          805
- Estimates for GE teachers
  of # of SWD:                             205

# Student Achievement

## Grade-Point Averages
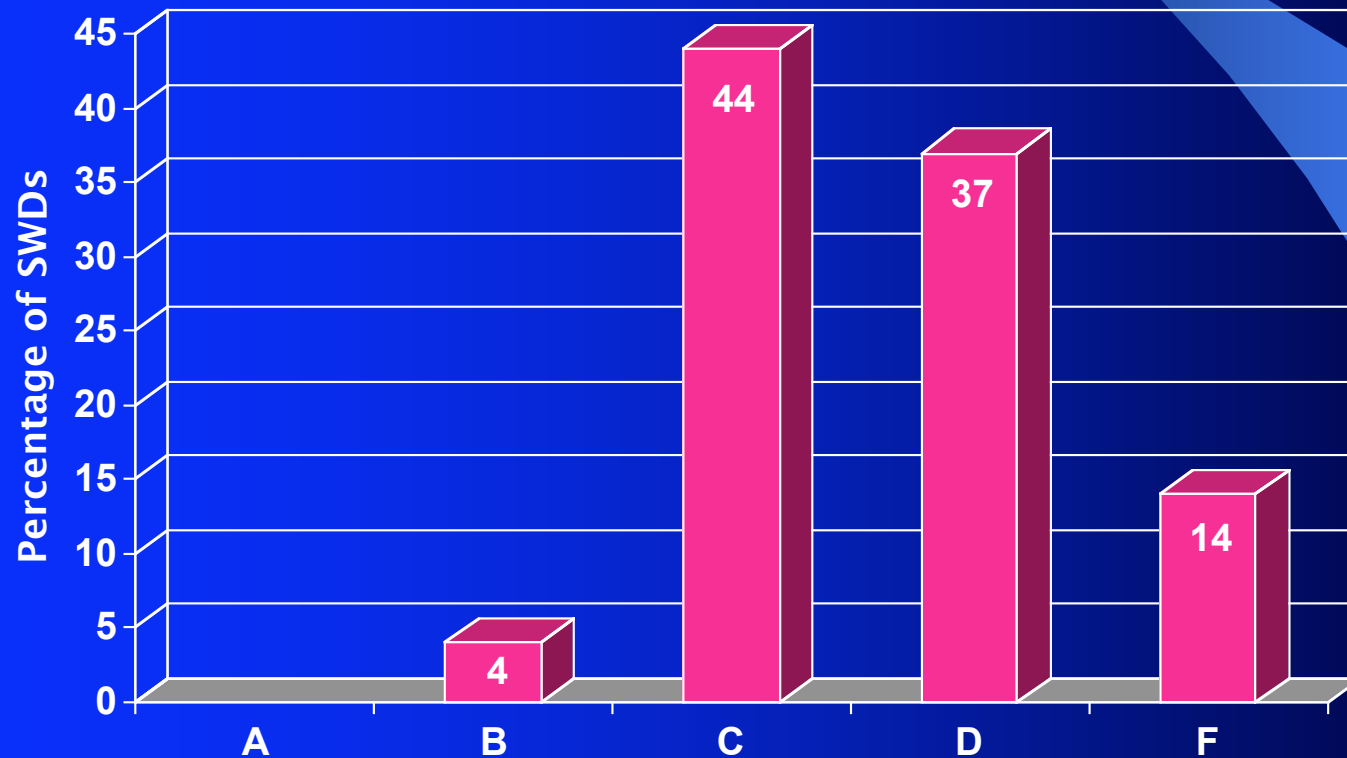
# Model for Ensuring Access and Positive Outcomes
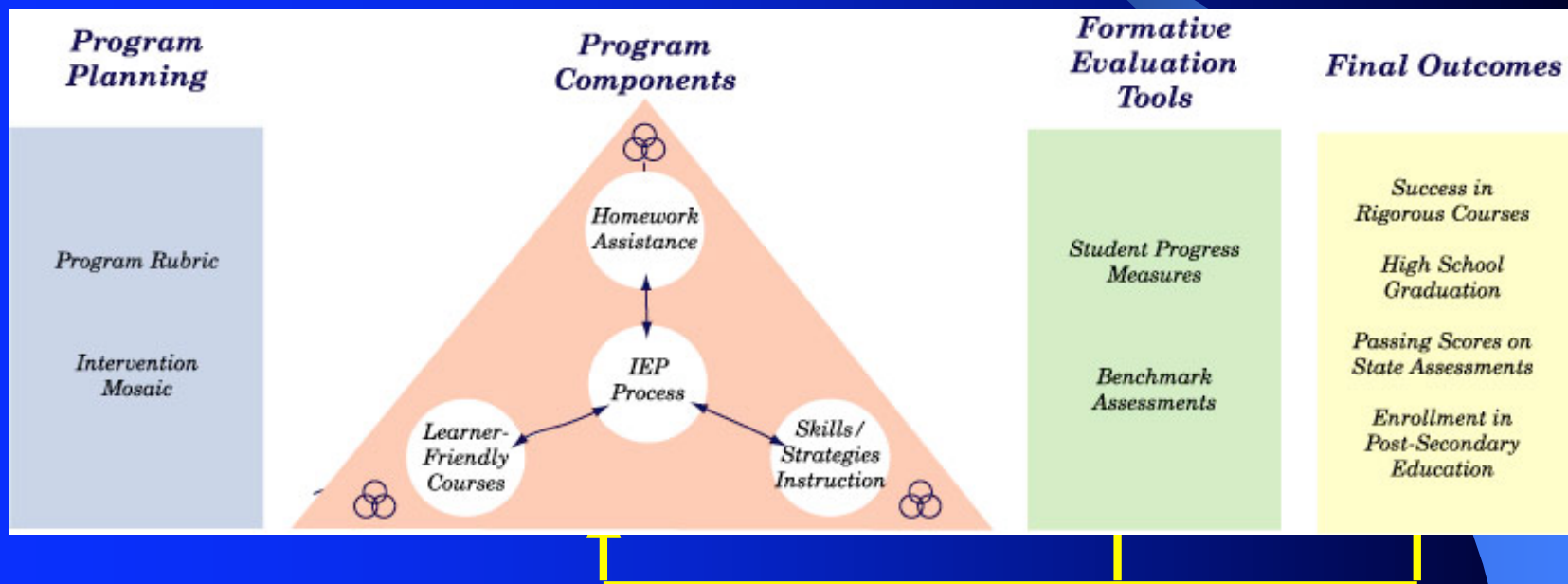
# The Content Literacy Continuum

**During School:**

**Level 1:**            **Enhanced content instruction** (Mastery of critical content for *all* regardless of literacy levels)

**Level 2:**            **Embedded strategy instruction** (Routinely weave strategies instruction within *and* across classes using large-group methods)

**Level 3:**            **Intensive strategy instruction** (Mastery of specific strategies using 8-stage instructional sequence; individual Strategic Tutoring)

**Level 4:**            **Intensive basic skill instruction** (Mastery of entry level literacy skills at the 4th-grade level)

**Level 5:**            **Therapeutic intervention** (Mastery of language underpinnings of curriculum content and learning strategies)

**After School:**        **Strategic Tutoring** (Extending the instructional time "box" through before- and after-school tutoring)

# Student-Learning Research Studies
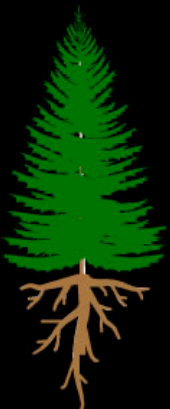
# Learner-Friendly Courses Through Content Enhancement

# Comparing Two Concepts

# Concept Comparison Table

## COMPARISON TABLE

| ② OVERALL CONCEPT | C | Communicate targeted concepts |
| ELEMENTS OF LITERATURE | O | Obtain the Overall Concept |
| | M | Make lists of known characteristics |
| | P | Pin down Like Characteristics |
| | A | Assemble Like Categories |
| | R | Record Unlike Characteristics |
| | I | Identify Unlike Categories |
| | N | Nail down a summary |
| | G | Go beyond the basics |

**① CONCEPT** Plot

**① CONCEPT** Theme

**③ CHARACTERISTICS**

May be one or more in a work of literature

Found in narrative literature

Consists of a sequence of events

Provides entertainment

**③ CHARACTERISTICS**

May be one or more in a work of literature

Found in a variety of literature

Consists of a statement about meaning

Delivers a message or idea

**⑨ EXTENSIONS**

Investigate the element of "style" in literature, and create a list of characteristics to be compared to plot and theme. Use this information to develop a Multiple-Concept Comparison Table.

**④ LIKE CHARACTERISTICS**

May be one or more in a work of literature

**⑤ LIKE CATEGORIES**

Number

**⑥ UNLIKE CHARACTERISTICS**

Found in narrative literature

Consists of a sequence of events

Provides entertainment

**⑥ UNLIKE CHARACTERISTICS**

Found in a variety of literature

Consists of a state-ment about meaning

Delivers a message or idea

**⑦ UNLIKE CATEGORIES**

Location

Form

Function

**⑧ SUMMARY**

Two elements of literature are plot and theme. They are alike in terms of the number used in any piece of literature (there may be more than one plot or theme in a piece of literature). They are different in their location in literature, the form they take, and the function they serve.

# Mean Percentage Total Scores

# Concept Anchoring Table

# Anchoring Known Information to New Information

# Concept Anchoring Routine

Condition 1: Sub-Groups of Students

| Concept | LD | LA | NA | HA |
|---|---|---|---|---|
| Pyramid of Numbers | Enhanced | Enhanced | Enhanced | Enhanced |
| Commensalism | Not Enhanced | Not Enhanced | Not Enhanced | Not Enhanced |

Condition 2: Sub-Groups of Students

| Concept | LD | LA | NA | HA |
|---|---|---|---|---|
| Pyramid of Numbers | Not Enhanced | Not Enhanced | Not Enhanced | Not Enhanced |
| Commensalism | Enhanced | Enhanced | Enhanced | Enhanced |

# Results for Student Subgroups
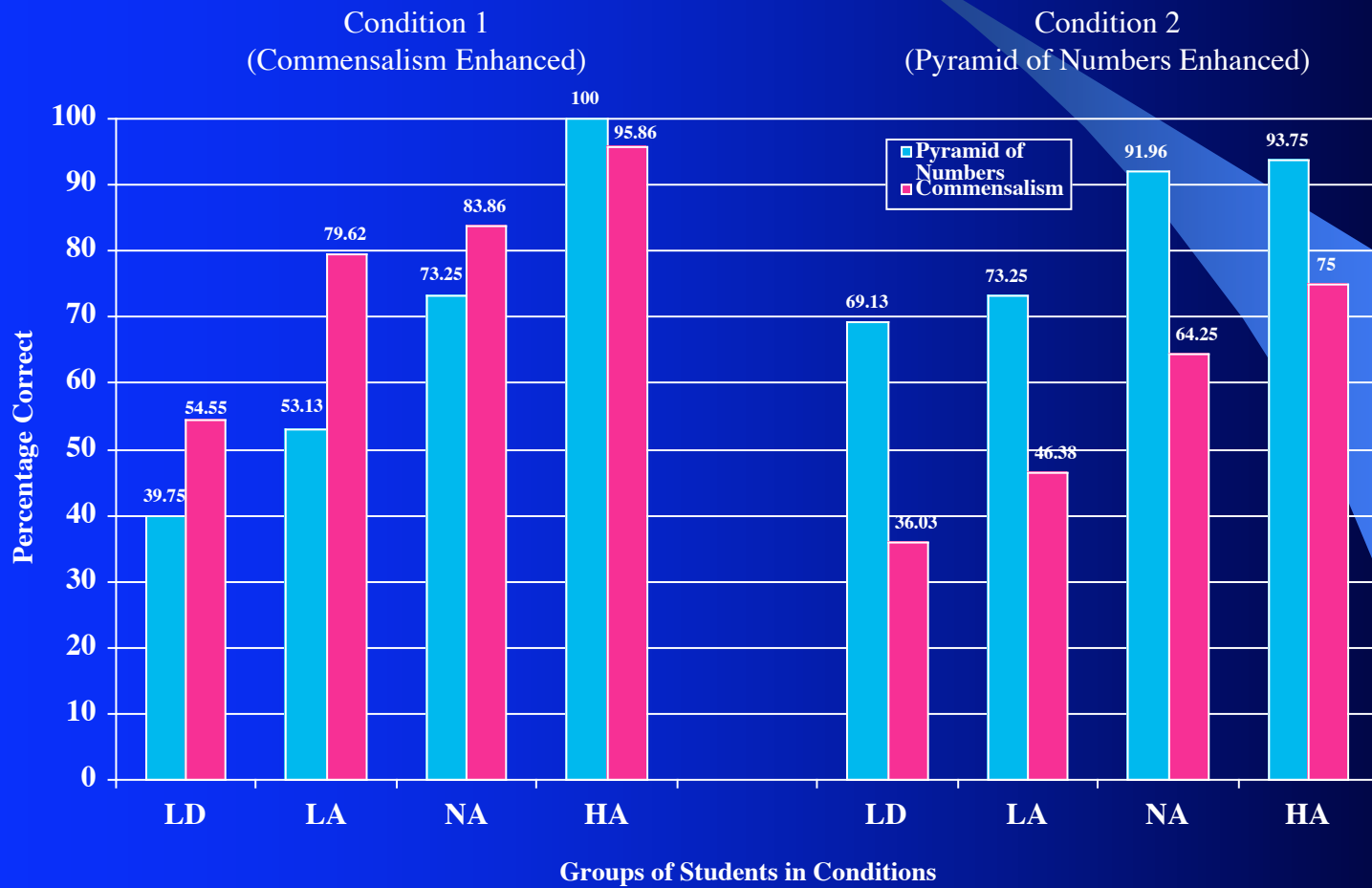
# Recall Enhancement Routine

| | Experimental Group | | Control Group | |
| --- | --- | --- | --- | --- |
| | LD (N=9) | NLD (N=11) | LD (N=9) | NLD (N=12) |
| Nonreviewed Facts | Presented in lecture | Presented in lecture | Presented in lecture | Presented in lecture |
| Reviewed Facts | Enhanced with routine | Enhanced with routine | Facts repeated | Facts repeated |

# Student Performance on Reviewed Facts
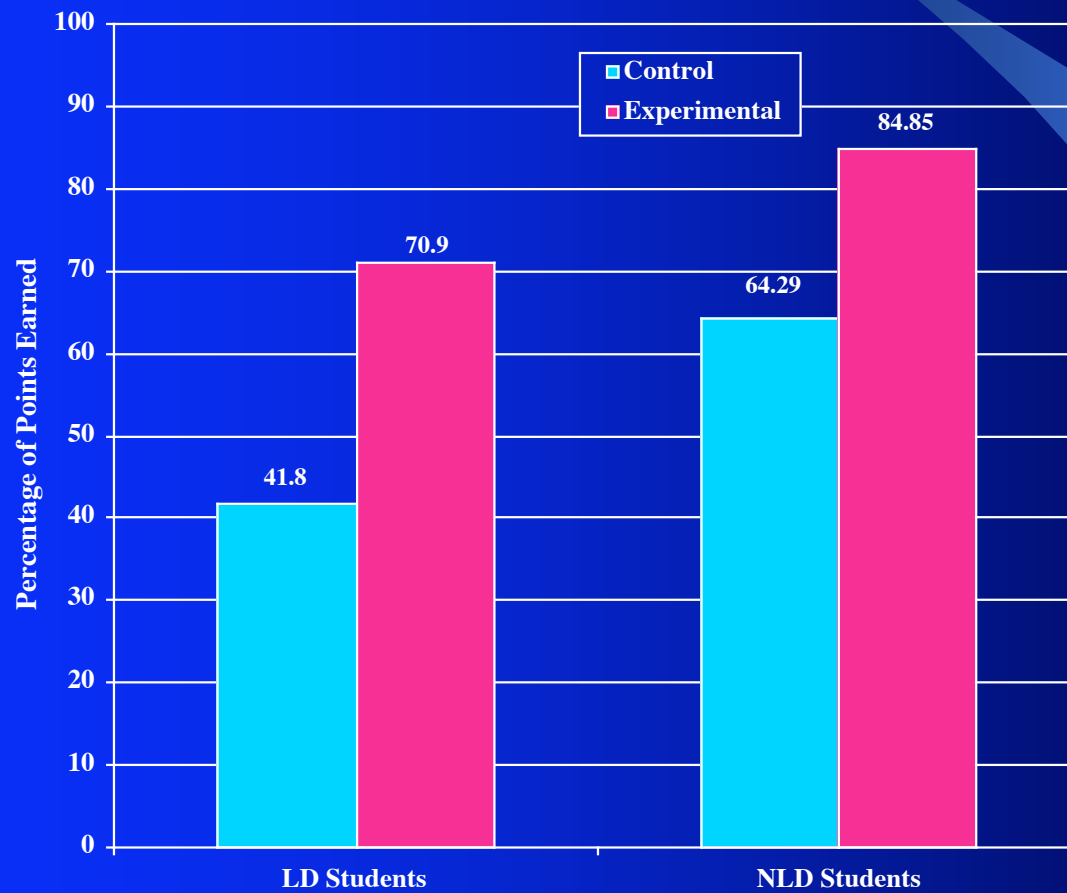
# Percentage of Students Performing at Passing Levels
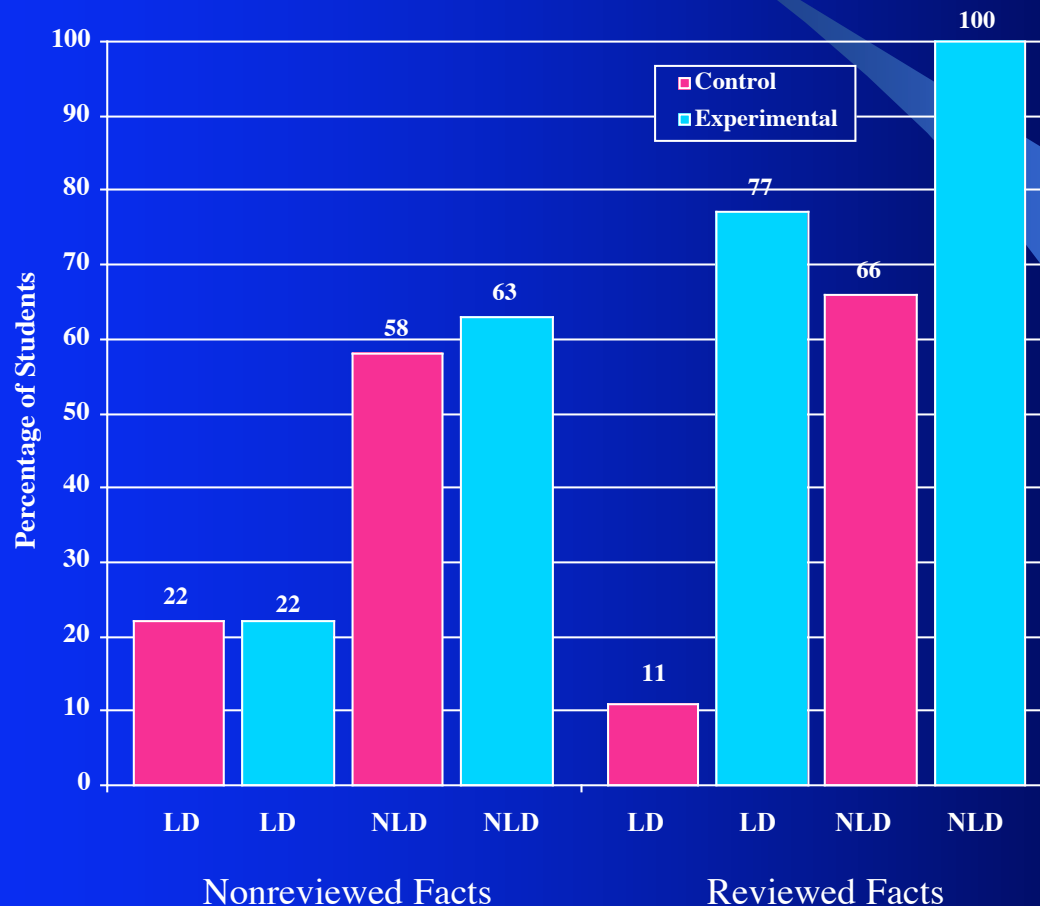
# Question
# Exploration
# Guide

## Question Exploration Guide

Title/standard: _____

Student name: _____ Date: _____

Course Question #: _____     Unit Question #: _____     Lesson Question #: _____

**(1)** What is the <u>Critical Question</u>?

**(2)** What are the <u>Key Terms</u> and explanations?

**(3)** What are the <u>Supporting Questions</u> and answers?

**(4)** What is the <u>Main Idea</u> Answer?

**(5)** How can we <u>use</u> the Main Idea?

**(6)** Is there an <u>Overall</u> Idea? Is there a real-world use?

# The Course Organizer

# The Frame Device

# Strategy Instruction

# Learning Strategies Curriculum

| ACQUISITION | STORAGE | EXPRESSION & DEMONSTRATION OF COMPETENCE |
|---|---|---|
| Word Identification Strategy | FIRST-Letter Mnemonic Strategy | Sentence Writing Strategy |
| Paraphrasing Strategy | Paired Associates Strategy | Paragraph Writing Strategy |
| Self-Questioning Strategy | LINCS Vocabulary Strategy | Error Monitoring Strategy |
|  |  | InSPECT Strategy |
|  |  | Theme Writing Strategy |
|  |  | Assignment Completion Strategy |
|  |  | Test-Taking Strategy |

# Learning Strategy

- A Learning Strategy is how a person plans, acts, and evaluates performance on a task and its outcome.

# Application of Strategies

Assignment: In chronological order,  list the political leaders of the Soviet Union from 1917 to the fall of communism. What strategies did you use?

**Lenin**

**Stalin**

**Khrushchev**

**Brezhnev**

**Andropov**

**Chernenko**

**Gorbachov**

# The Strategy

FIRST Letter Mnemonic Strategy:

Step 1: Form a word

Step 2: Insert a letter

Step 3: Rearrange the letters

Step 4: Shape a sentence

Step 5: Try combinations

LENIN

STALIN

KHRUSHCHEV

BREZHNEV

ANDROPOV

CHERNENKO

GORBACHOV

Little Soviet Kids Become Adult Commies Gradually

# The Sentence Writing Strategy

- $P$ick a formula

- $E$xplore words to fit the formula

- $N$ote the words

- $S$earch and check

# Sentence Writing Strategy
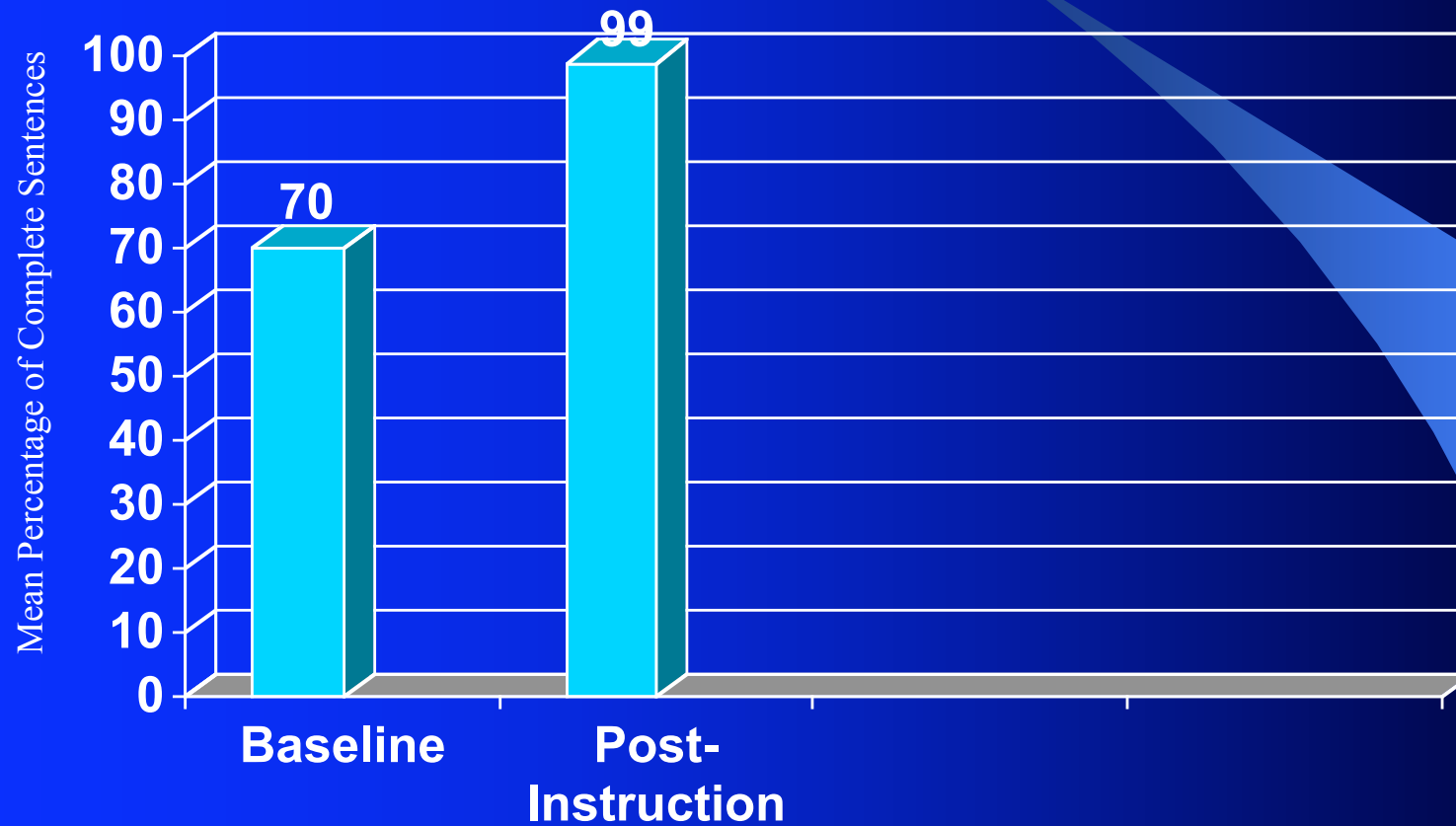
# The Paragraph Writing Strategy

- Set up a diagram
- Create a title
- Reveal the topic
- Iron out the details
- Bind it together with a clincher
- Edit your work

# Paragraph Writing Strategy
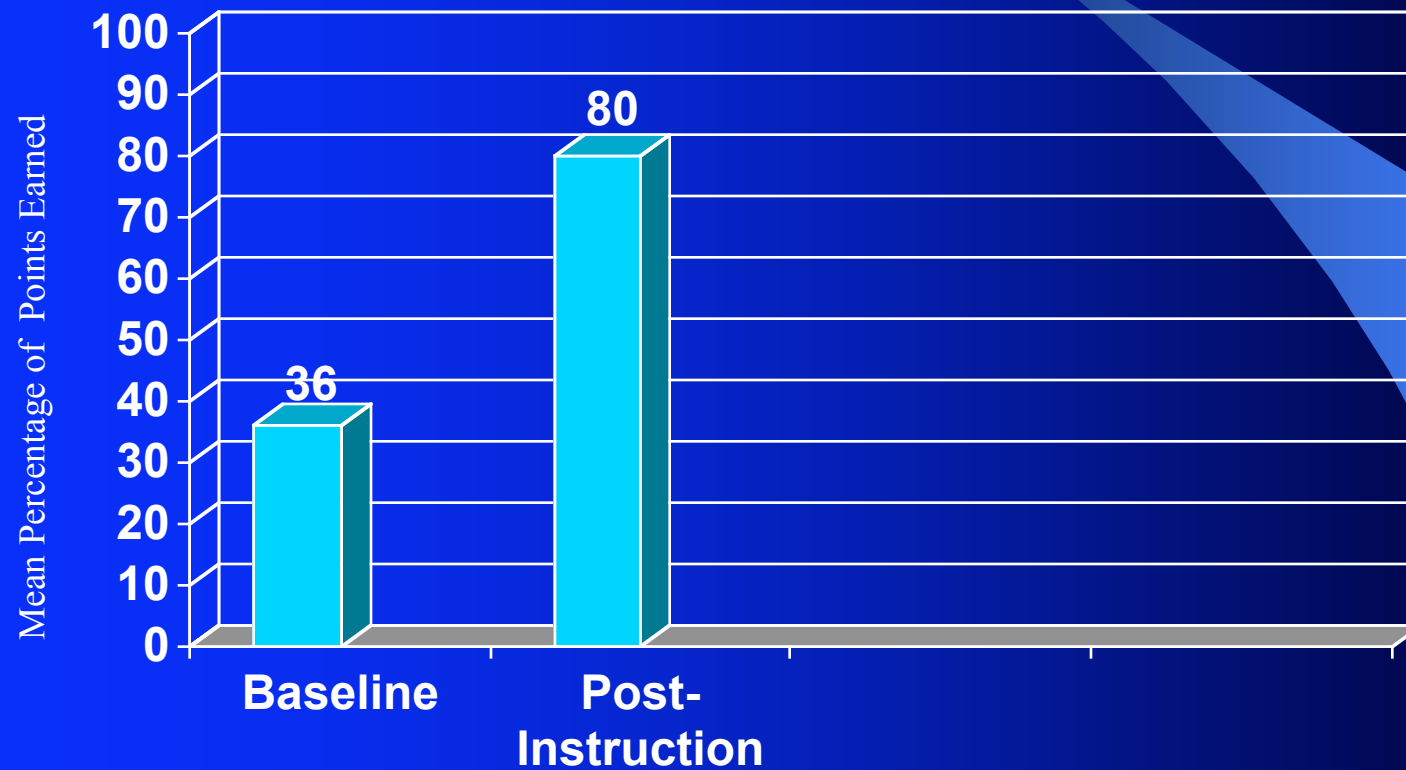
# The Error Monitoring Strategy

- **W**rite on every other line using "PENS"

- **R**ead the paper for meaning

- **I**nterrogate yourself using the "COPS" questions

- **T**ake the paper to someone for help

- **E**xecute a final copy

- **R**eread your paper
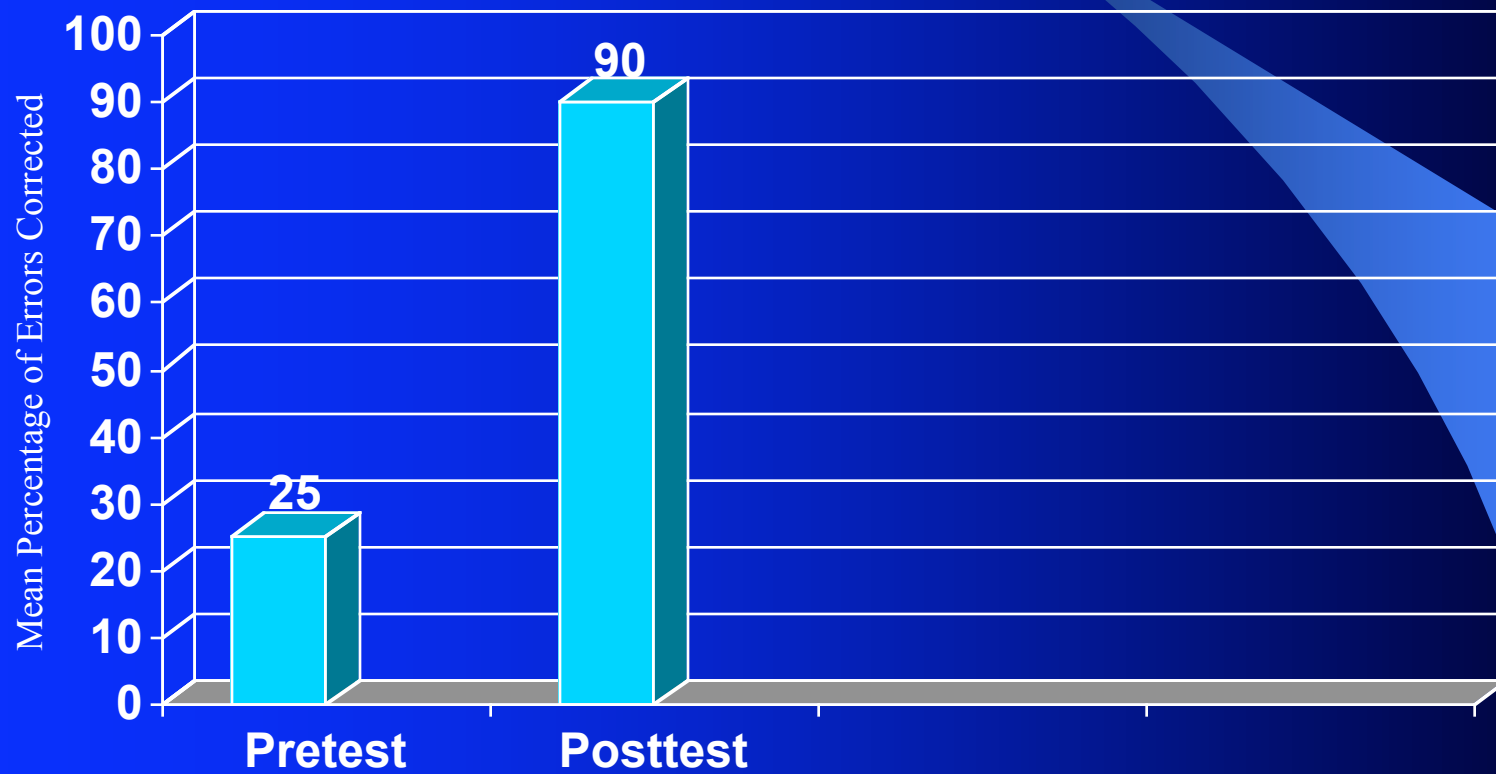
# Error Monitoring Strategy

# Steps of the Theme Writing Strategy

- Think

- Organize it

- Write a draft

- Evaluate it

- Refine it

# Theme Writing Strategy
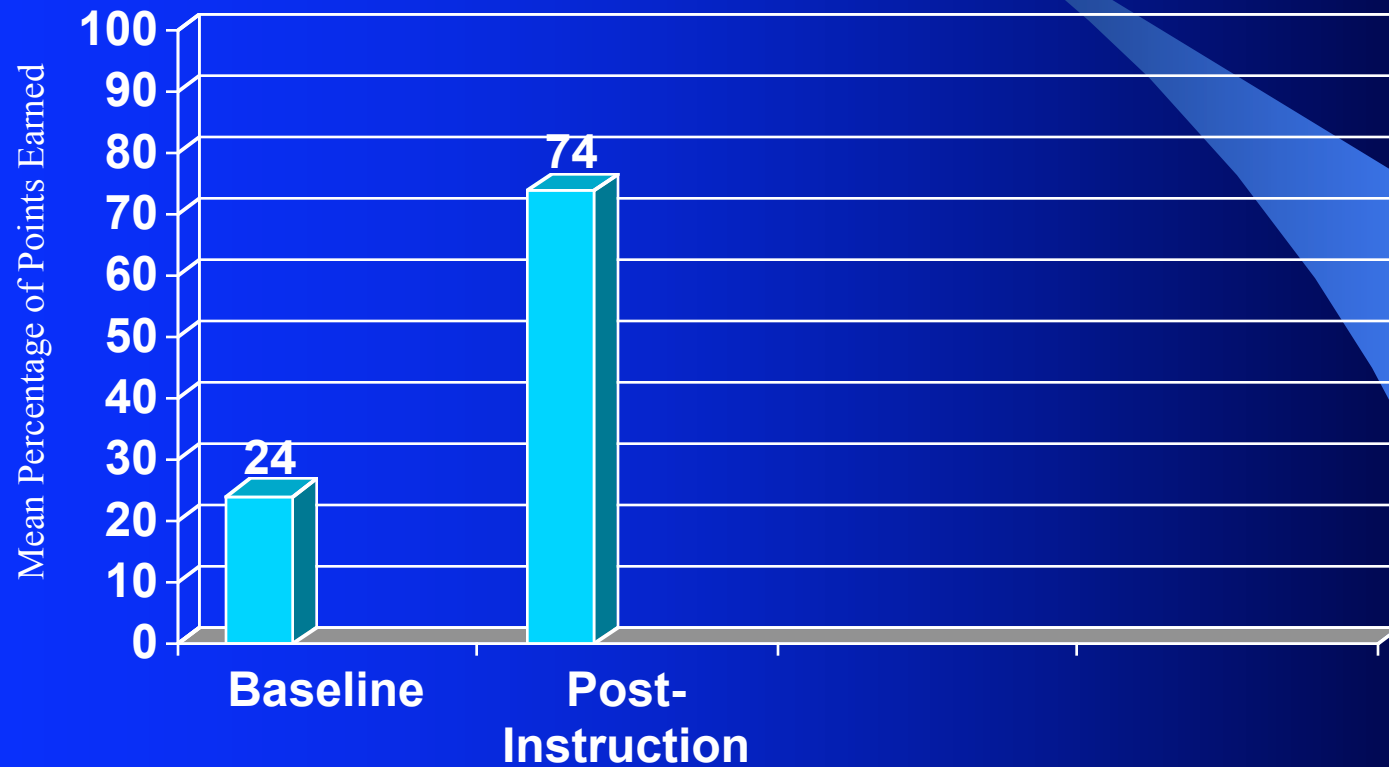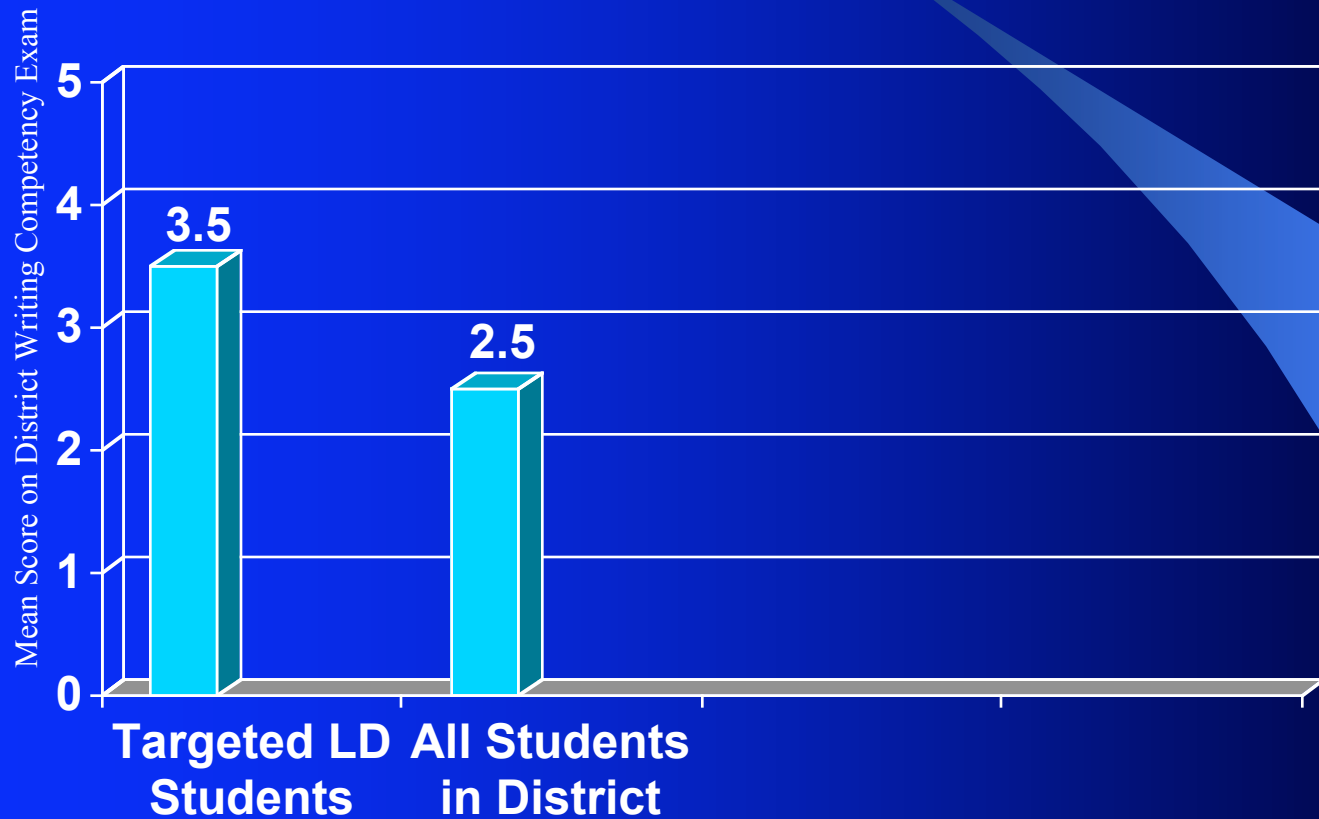
# Theme Writing Strategy
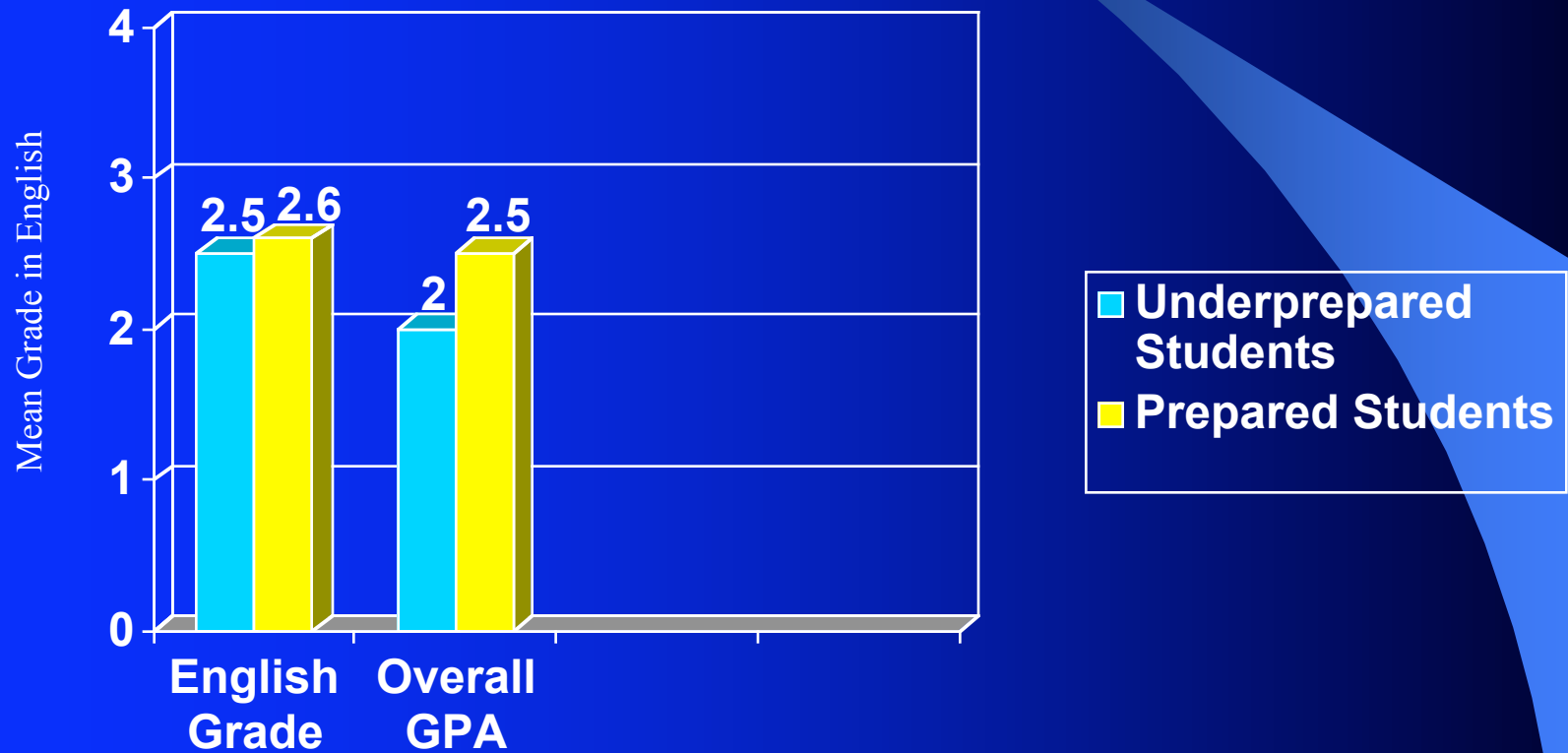
# Homework Assistance through Strategic Tutoring

# Strategic Tutoring Instructional Phases

**TEACHING**

**Assessing** → **Constructing** → **Transferring**
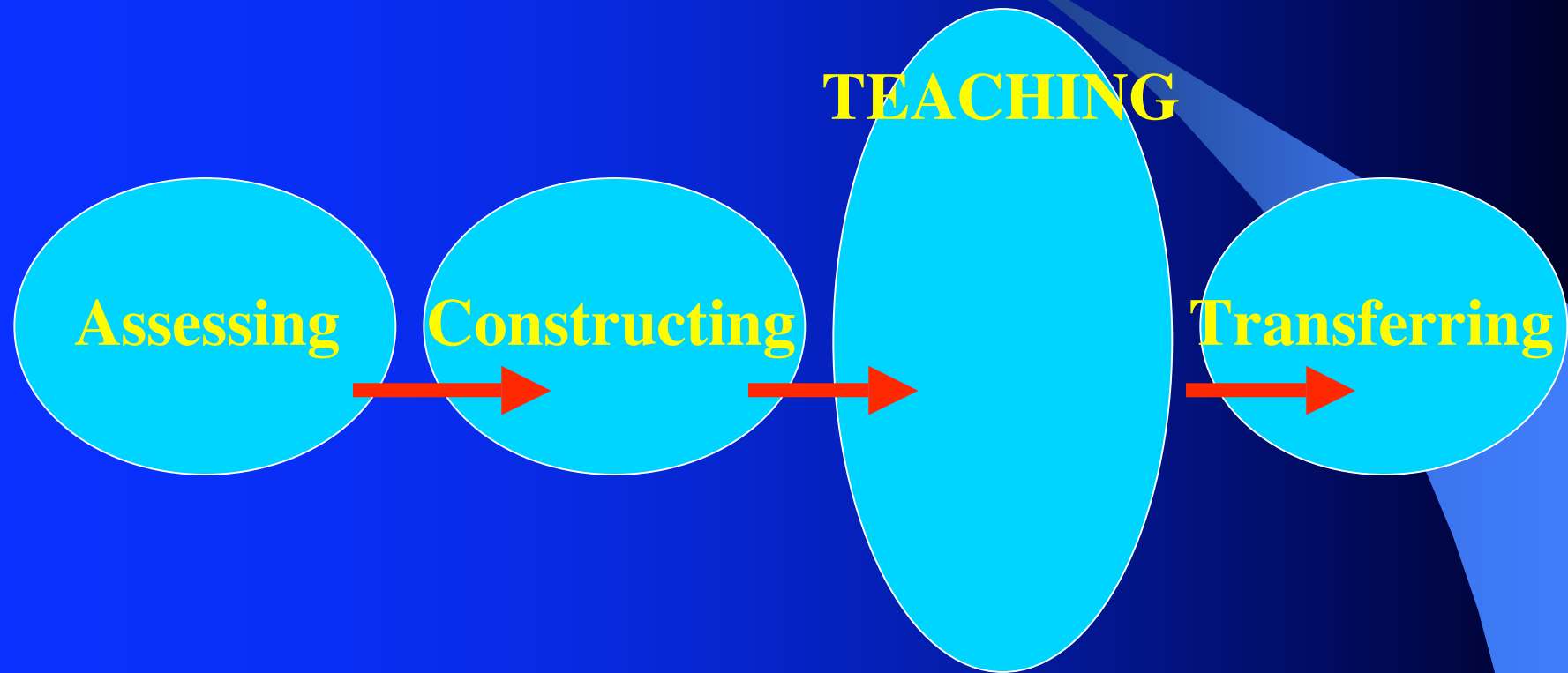
# Strategic Tutoring Model

The role of the Strategic Tutor is to:

- Explain content, build knowledge
- Share extensive knowledge of strategies
- Apply principles of Strategic Instruction
- Mentor and "connect" with students

# Strategic Tutoring Study 1
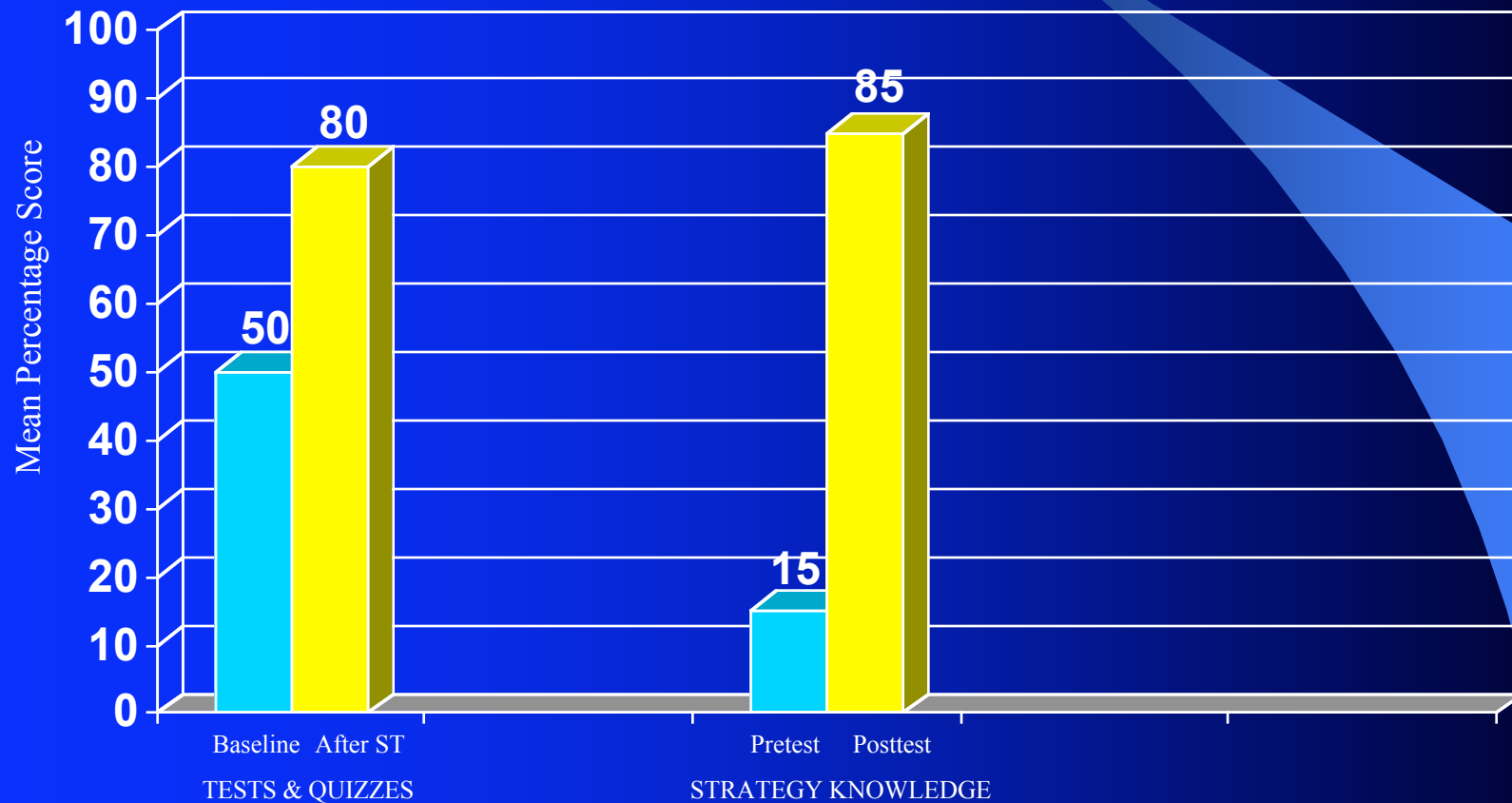
# Teacher-Learning Studies

# Teacher Training Results



**Baseline** ■ **After Training**

Percentage of Teacher Behaviors Performed

| | Concept Mastery | Concept Compar. | Concept Anchoring | Recall Enhance. |
|---|---|---|---|---|
| Baseline | 24 | 8.5 | 4 | 7 |
| After Training | 93 | 93 | 94 | 96 |

Content Enhancement Routines
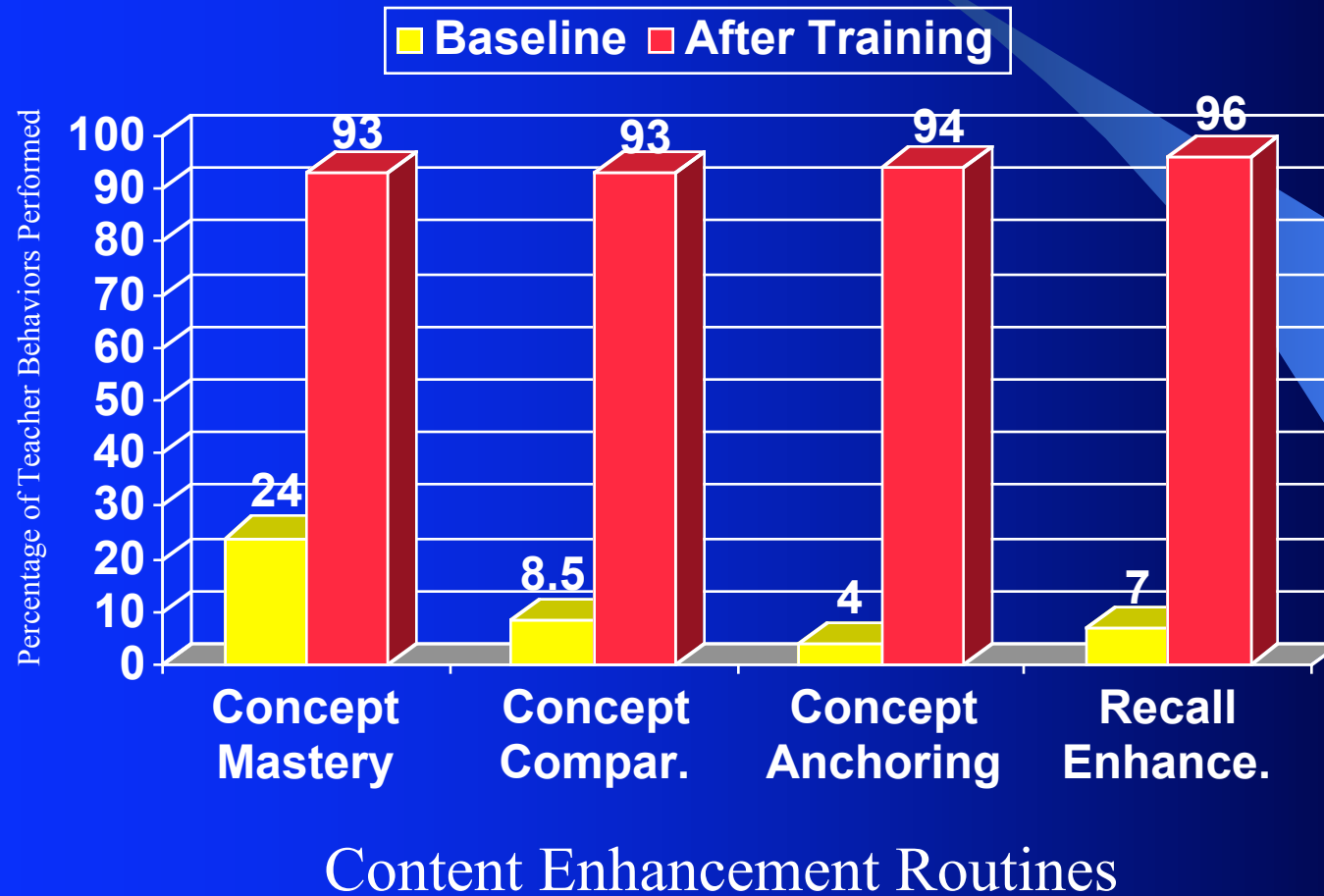
# Professional Development Approaches

- Traditional
  - Inservice on inservice days

- Enlightened
  - Interviews, partnership learning, participant choice, in-class modeling, ongoing

- Instructional Coaches
  - Enlightened + Onsite coaching and collaboration for implementation

# Implementation Rates
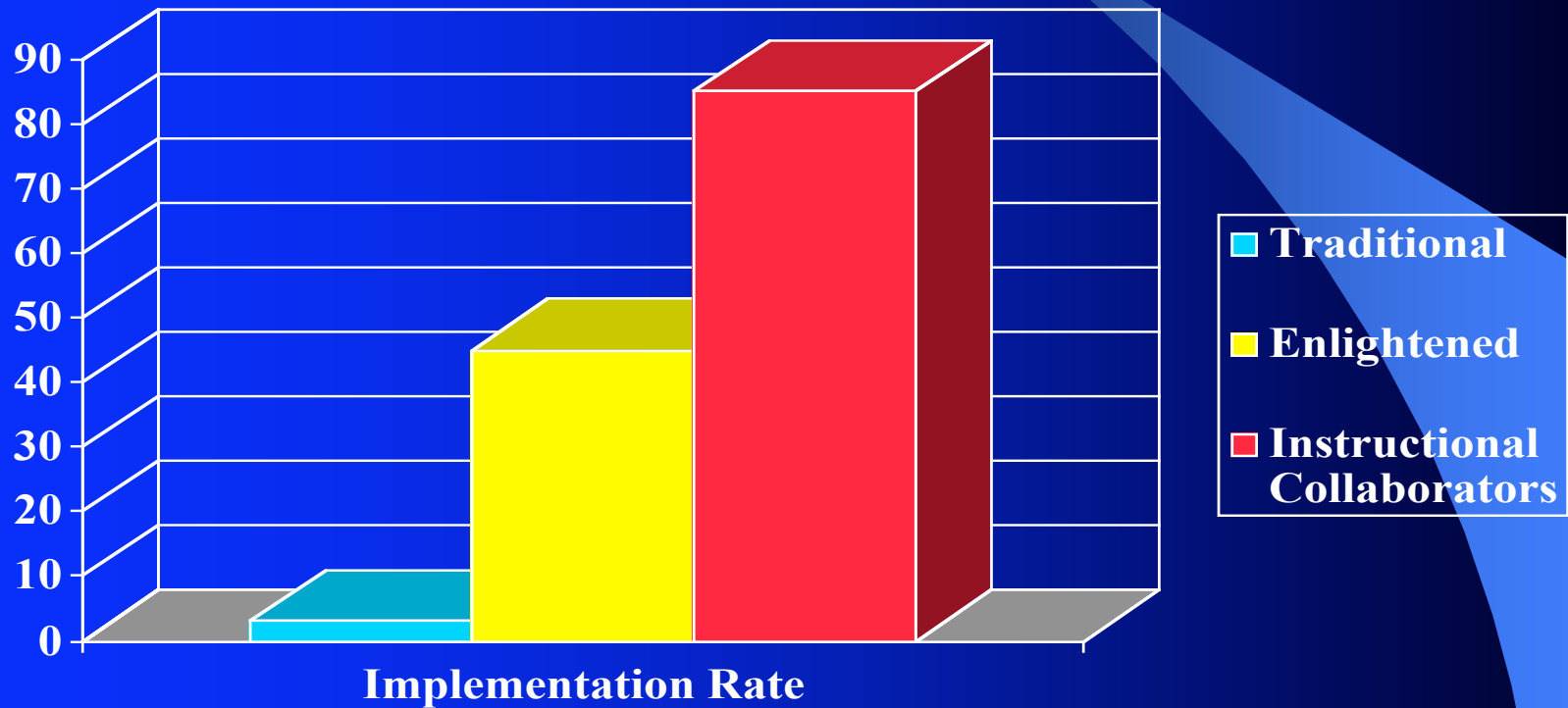
# Effectiveness of Staff Development Activities

|  | Knowledge | Skill Acquisition | Classroom app. |
|---|---|---|---|
| • Present information | 40-80% | 10% | 5% |
| • Present & Model | 80-85% | 10-40% | 5-10% |
| • Present & Model & Practice & Feedback | 80-85% | 80% | 10-15% |
| • Present & Model & Practice & Feedback & Coaching | 90% | 90% | 80-90% |

# Lesson 1: The Anchoring Table

# Lesson 2: The Linking Steps

# Lesson 3: The Cue-Do-Review Sequence

# Lesson 4: Example Routines

# Creating Your Own Anchoring Table

# Study 1: Implementation Results
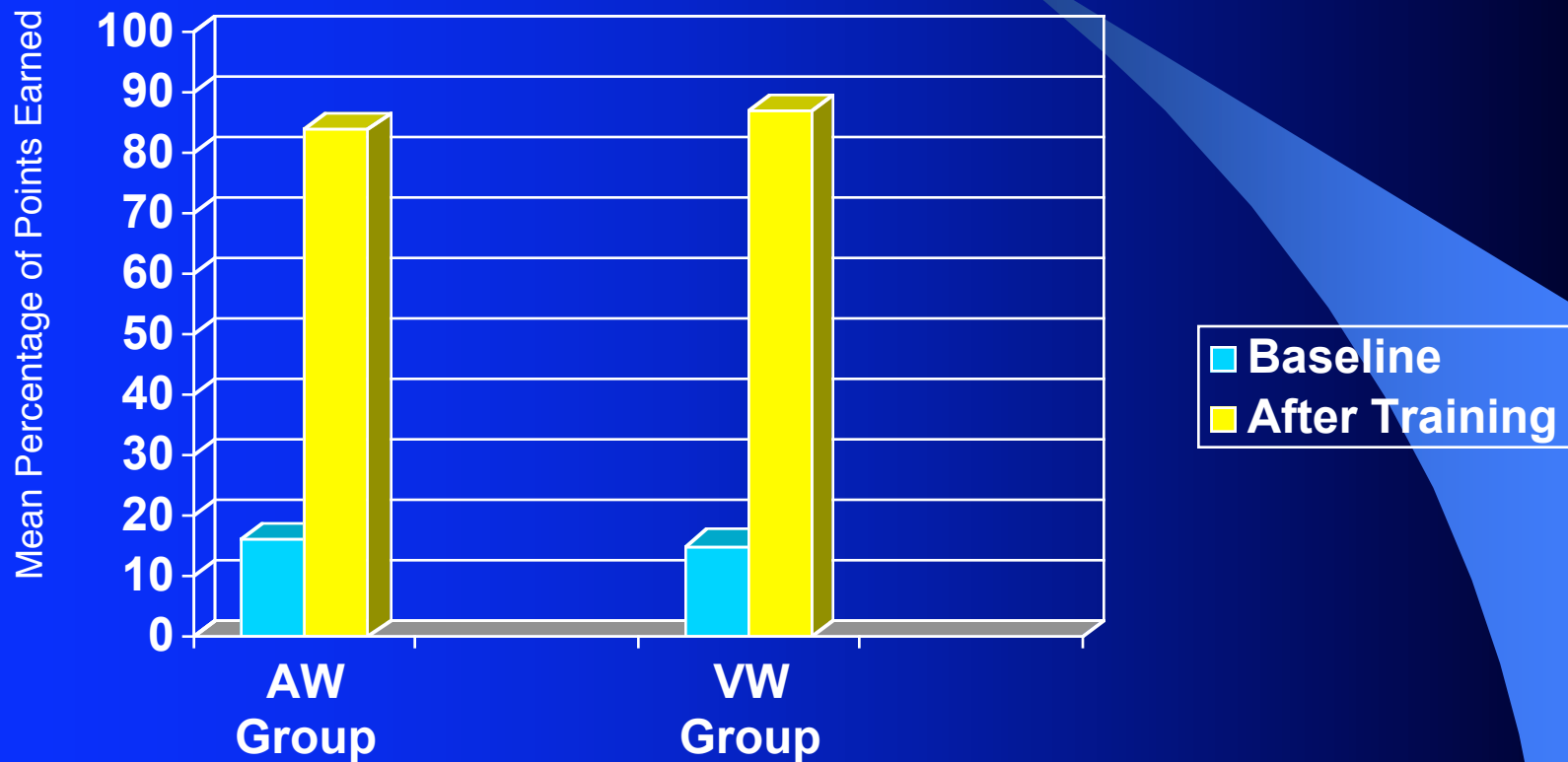


ANCOVA: No differences
R.M. ANOVA: Significant gains for both groups (p <.001)

# Study 1: Knowledge Test Results



Mean Percentage of Points Earned

AW Group

VW Group

Pretest
Posttest
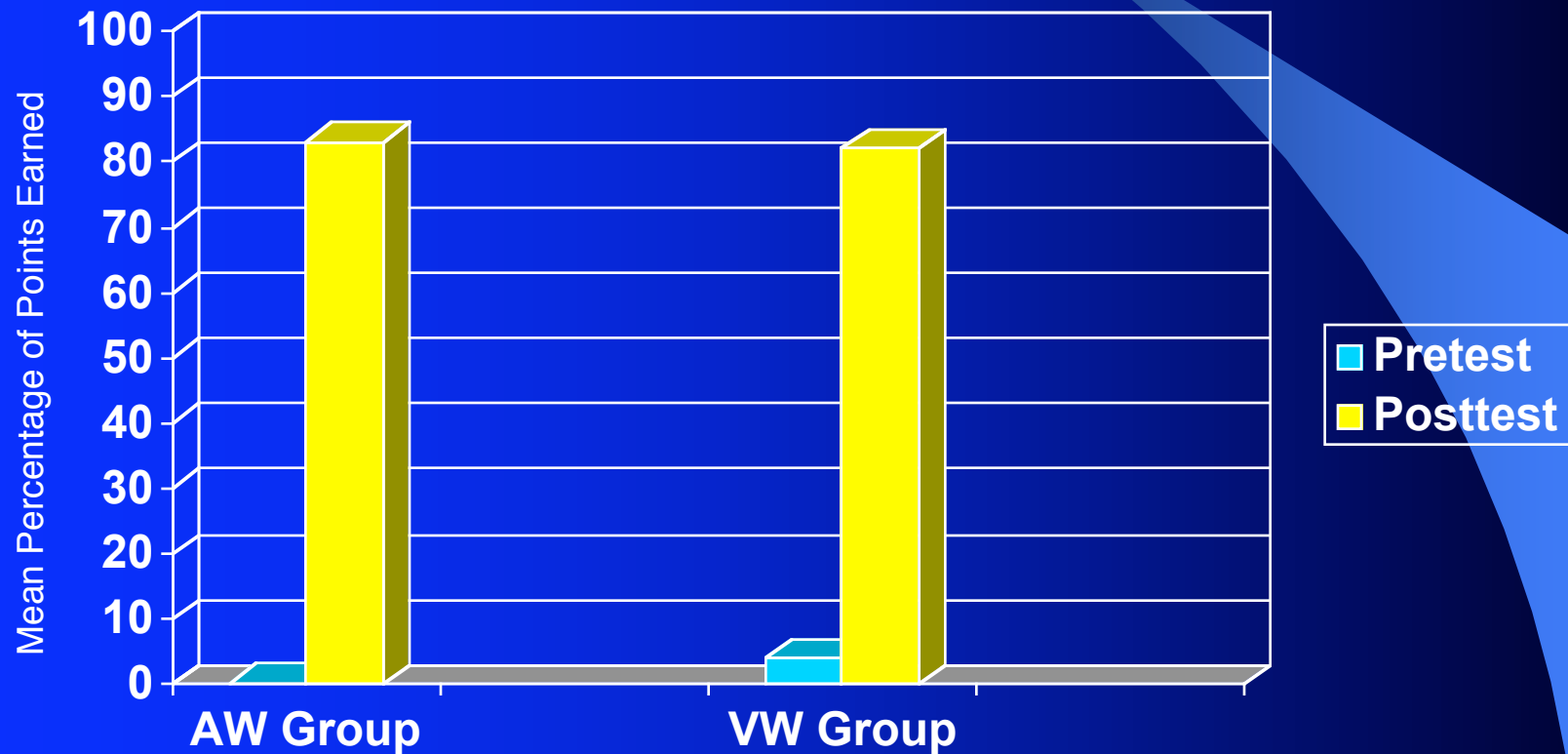
ANCOVA: No differences
R.M. ANOVA: Significant gains for both groups (p <.001)

Study 1: Anchoring Table Test

# Study 1: Concept Acquisition Test (All Students)



Percentage of Points Earned

AW Group                    VW Group

■ Pretest
■ Posttest
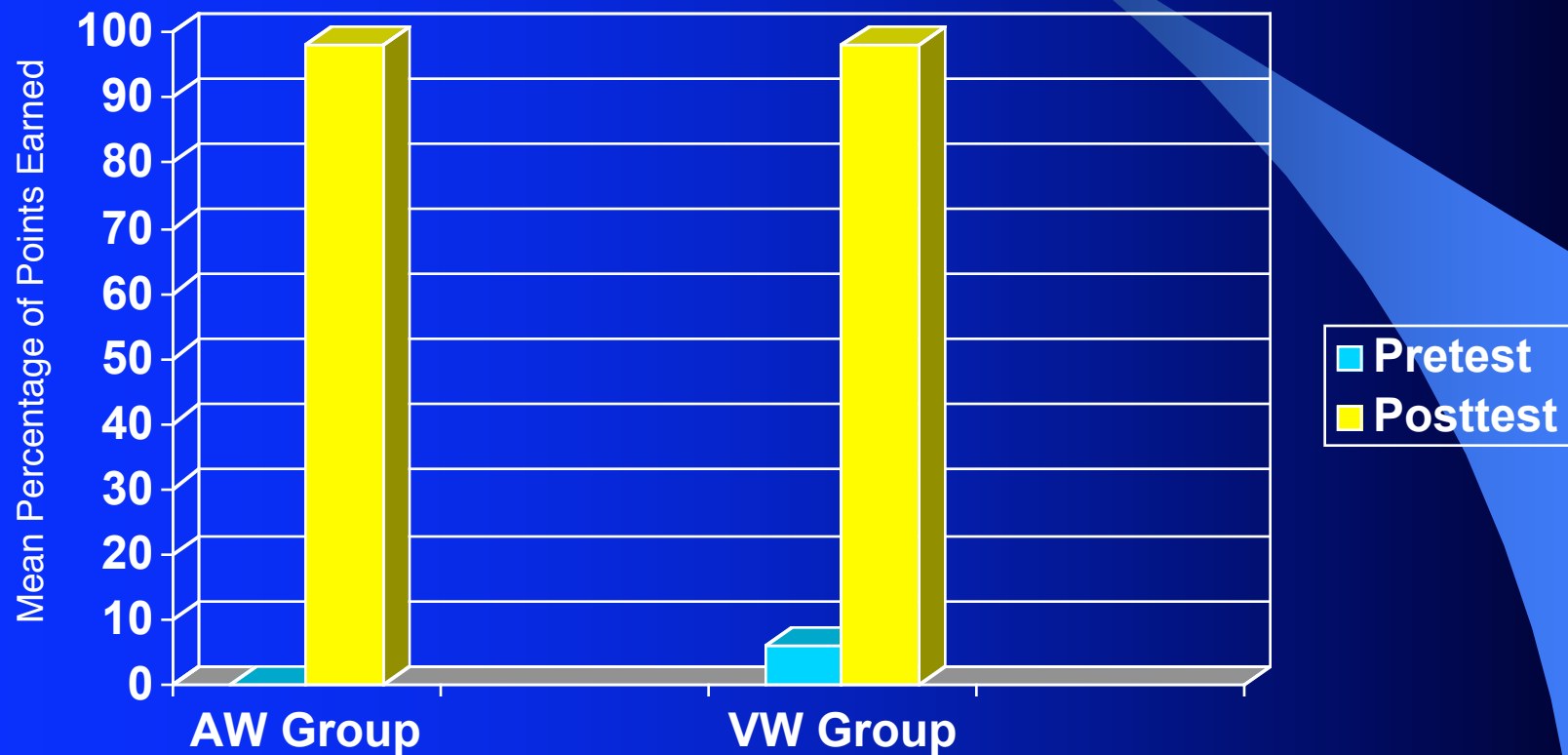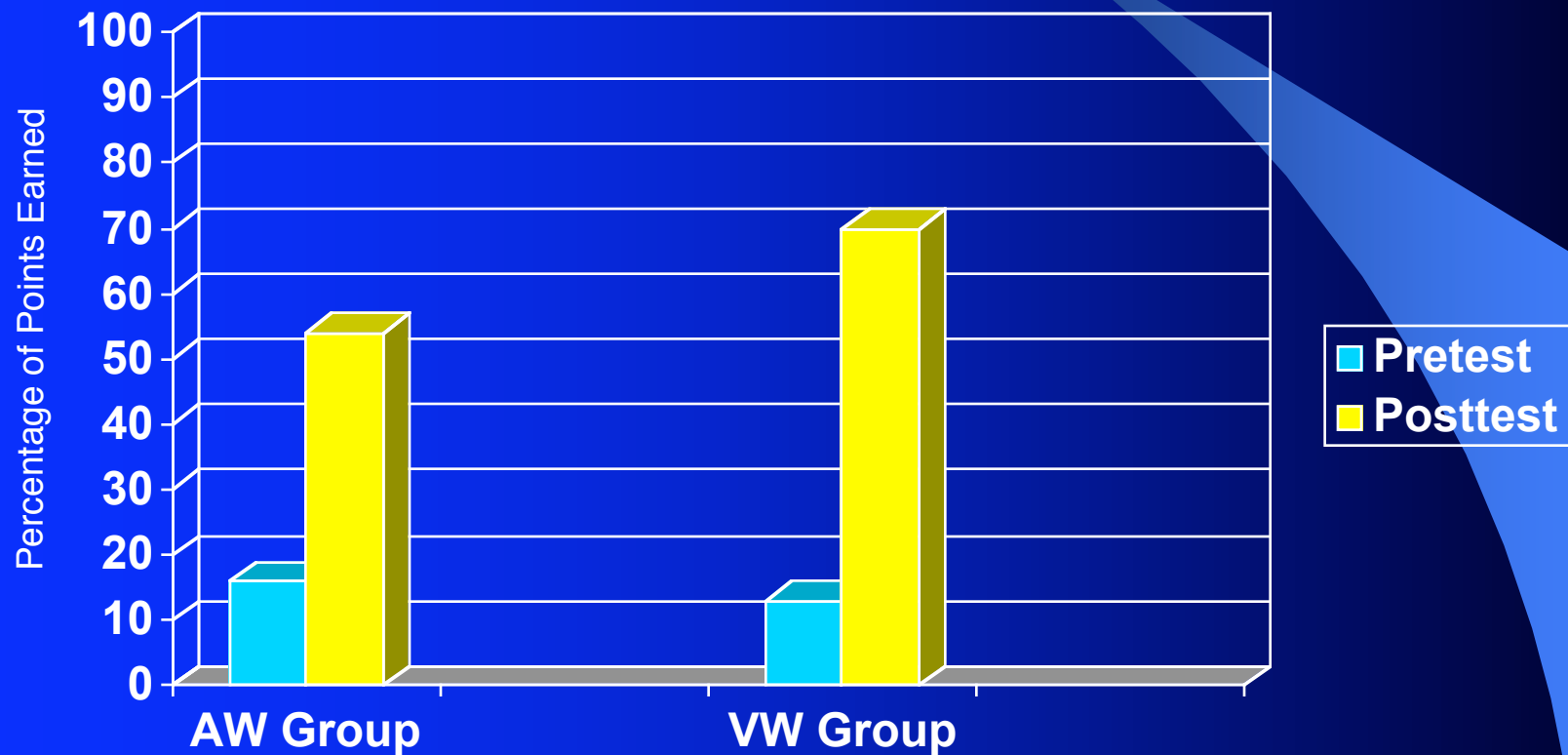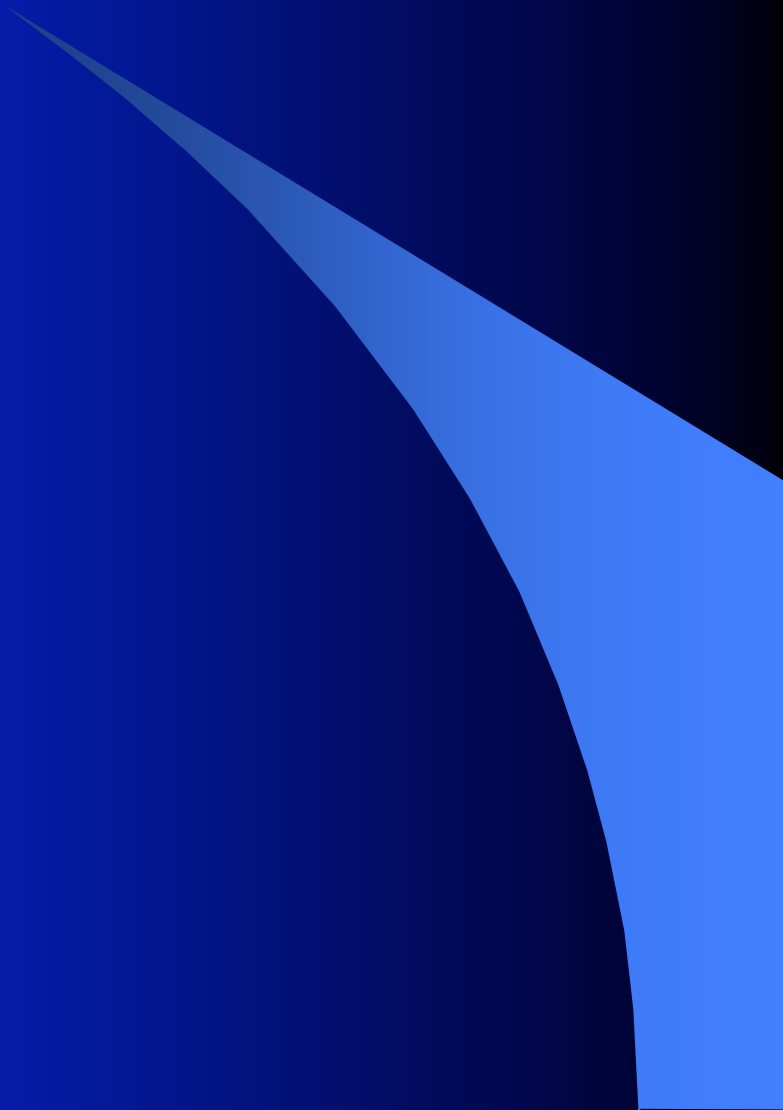
HLM Approach:  Significant posttest differences (p< .014)
Significant gains for both groups (p<.001)
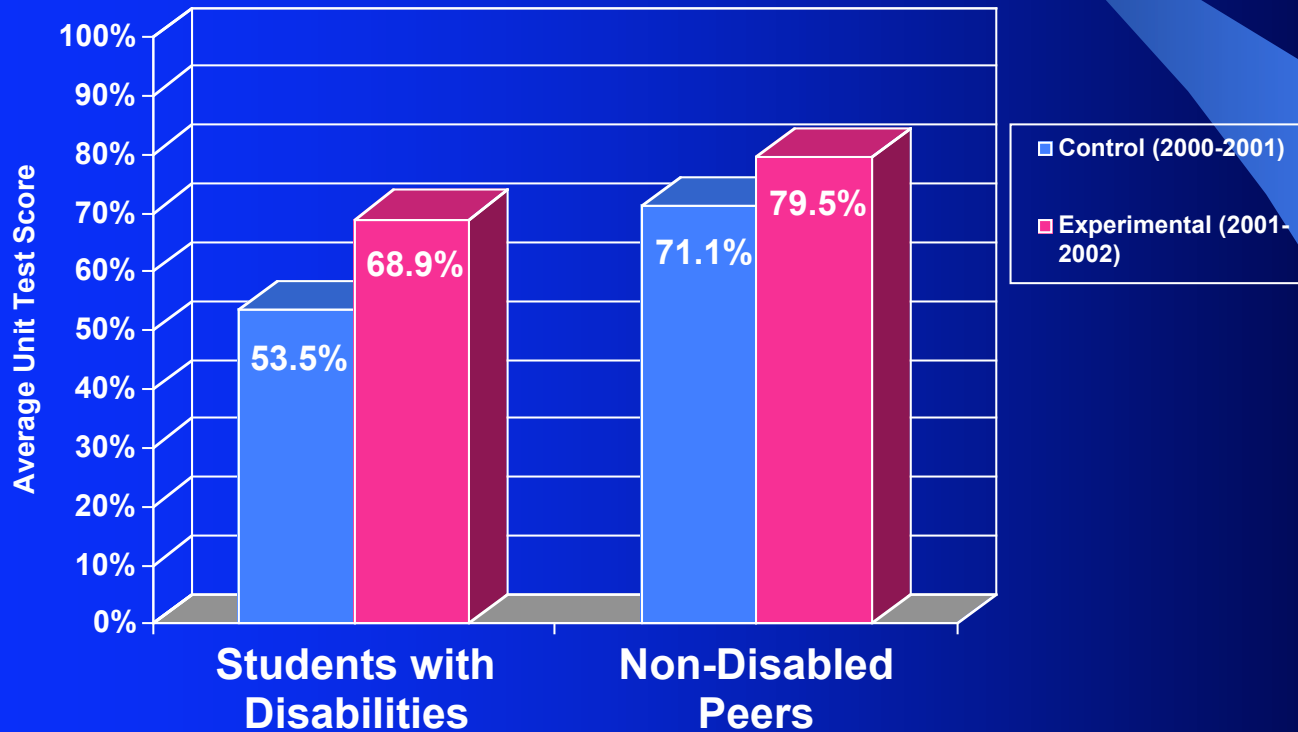
# Study 1: Concept Acquisition Test (Students with LD)
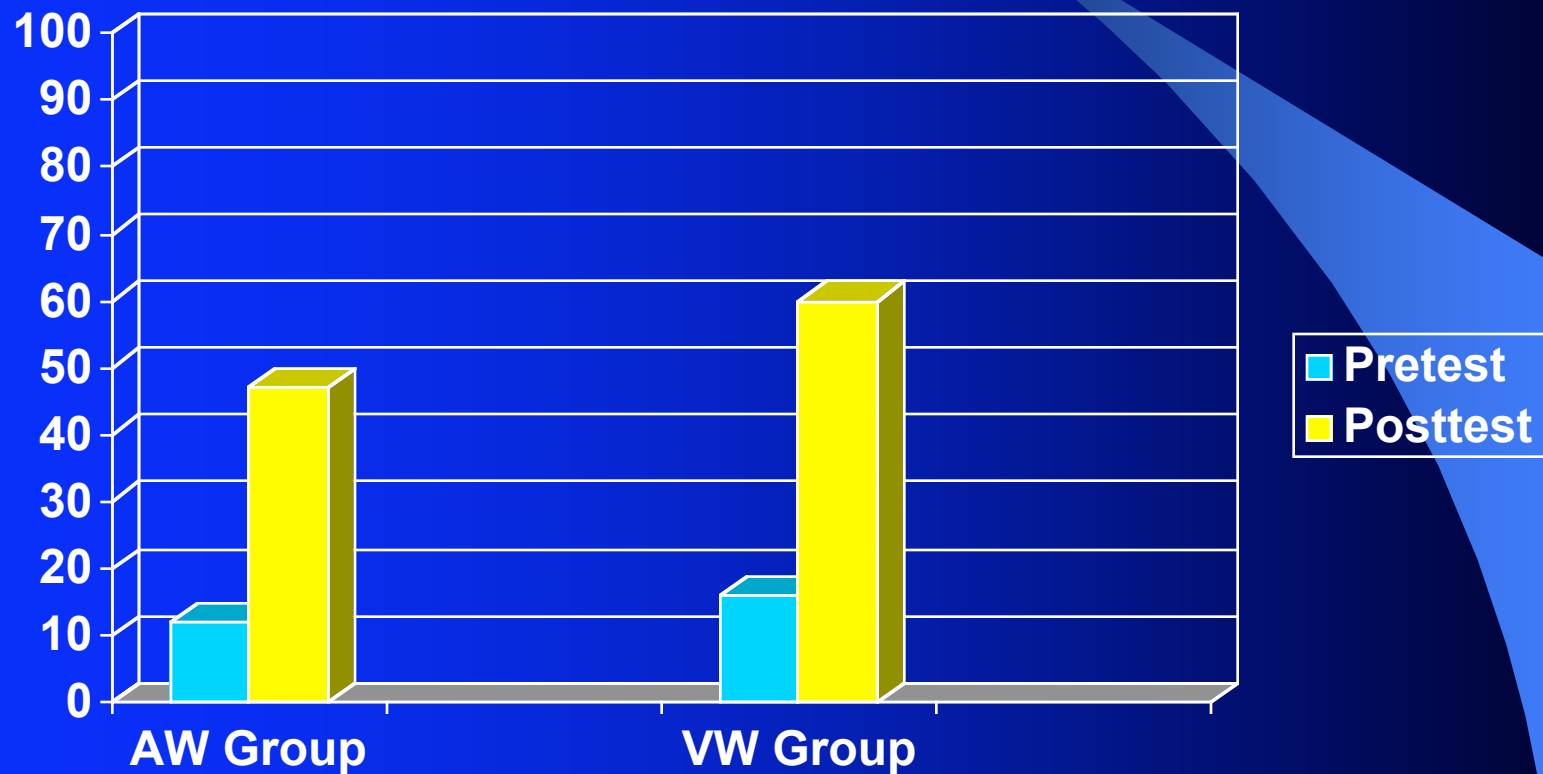
HLM Approach:     No significant differences between groups
Significant gains for both groups (p<.001)

# School-Change Research

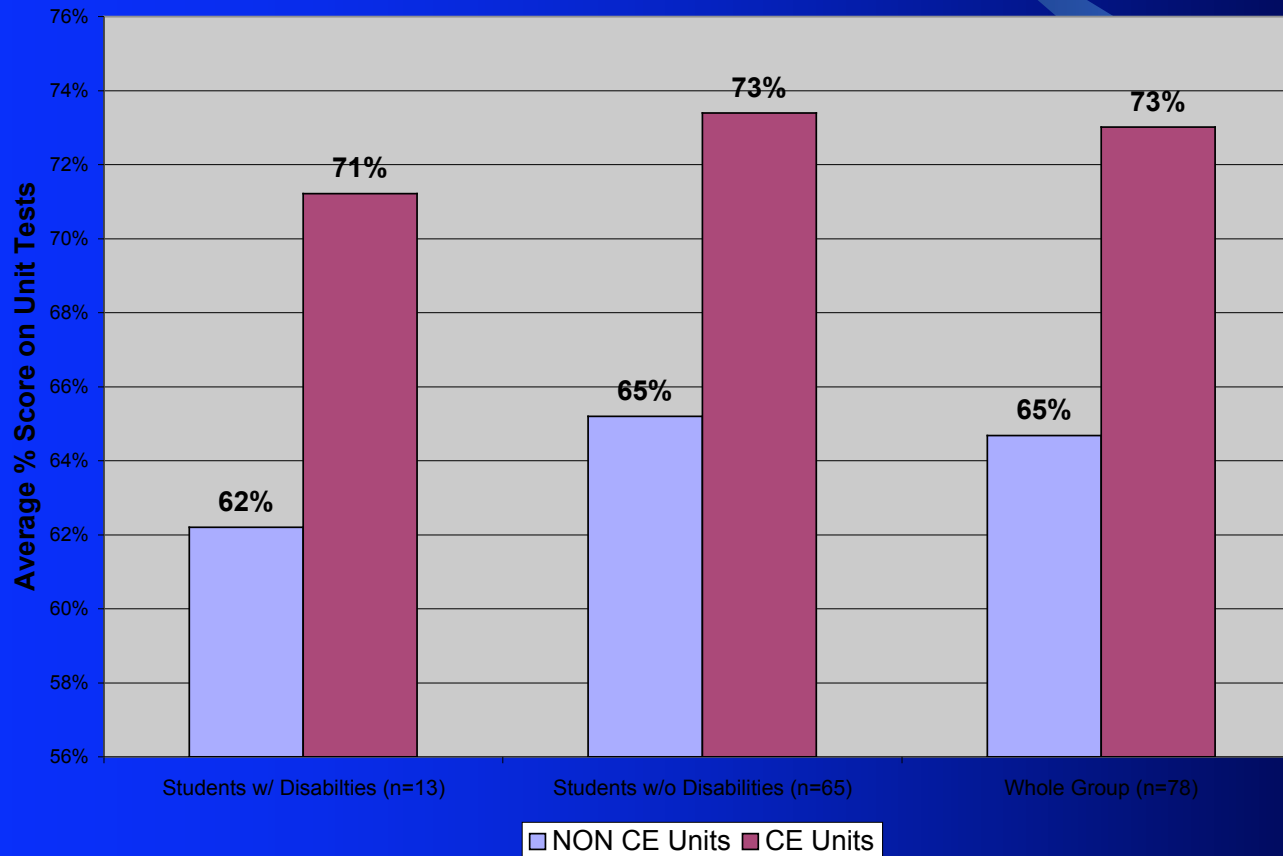# Effects of Content Enhancement

**General Education Economics Class (10th)**
**Muskegon High School**



Legend:
- Control (2000-2001)
- Experimental (2001-2002)

Students with Disabilities: 53.5% (Control), 68.9% (Experimental)
Non-Disabled Peers: 71.1% (Control), 79.5% (Experimental)

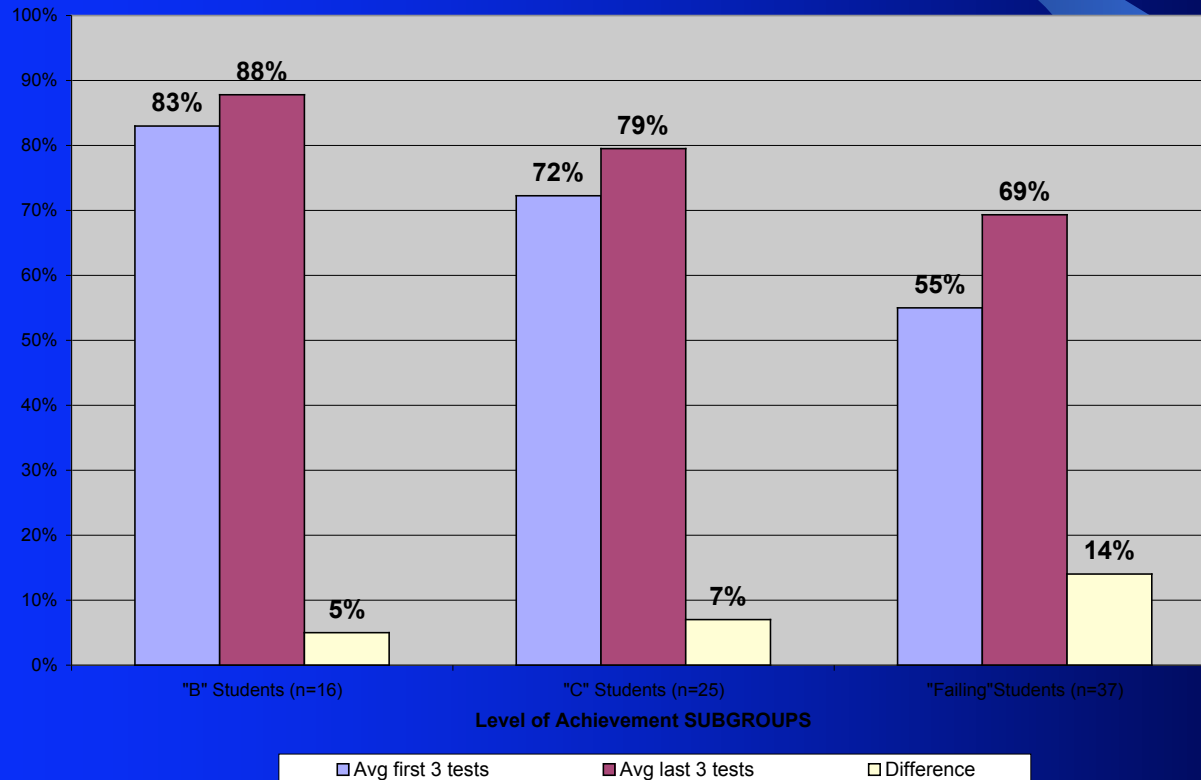Y-axis: Average Unit Test Score (0% to 100%)

# 9th Grade Physical Science



9th Grade Physical Science  (n-78)

# Content Enhancement Study at MHS 9th Grade Physical Science

**Content Enhancement Study at MHS 9th Grade Physical Science**
**A Look at Various Achievement Subgroups**
**(Subgroups determined by average of first three tests given.)**

| | "B" Students (n=16) | "C" Students (n=25) | "Failing" Students (n=37) |
|---|---|---|---|
| Avg first 3 tests | 83% | 72% | 55% |
| Avg last 3 tests | 88% | 79% | 69% |
| Difference | 5% | 7% | 14% |

**Level of Achievement SUBGROUPS**

Legend: ☐ Avg first 3 tests  ■ Avg last 3 tests  ☐ Difference
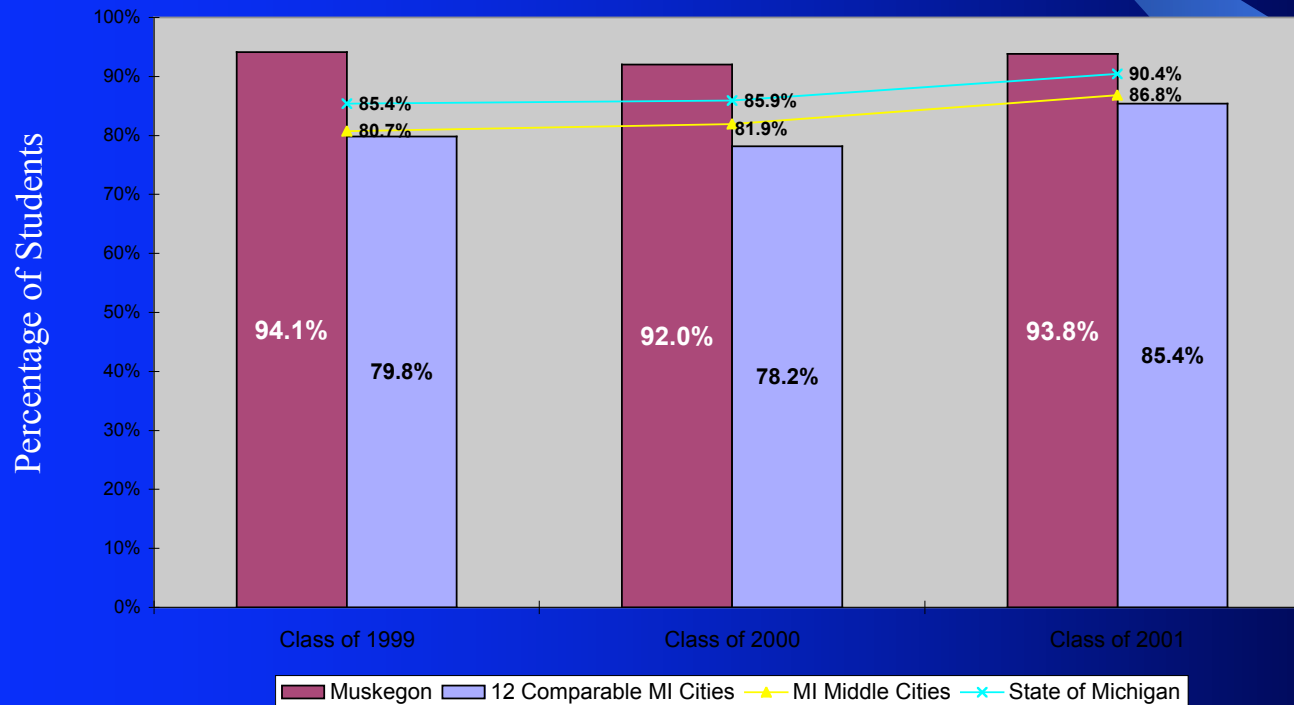
# Sentence Writing Strategy
## (Example Class Among 1000 Students)
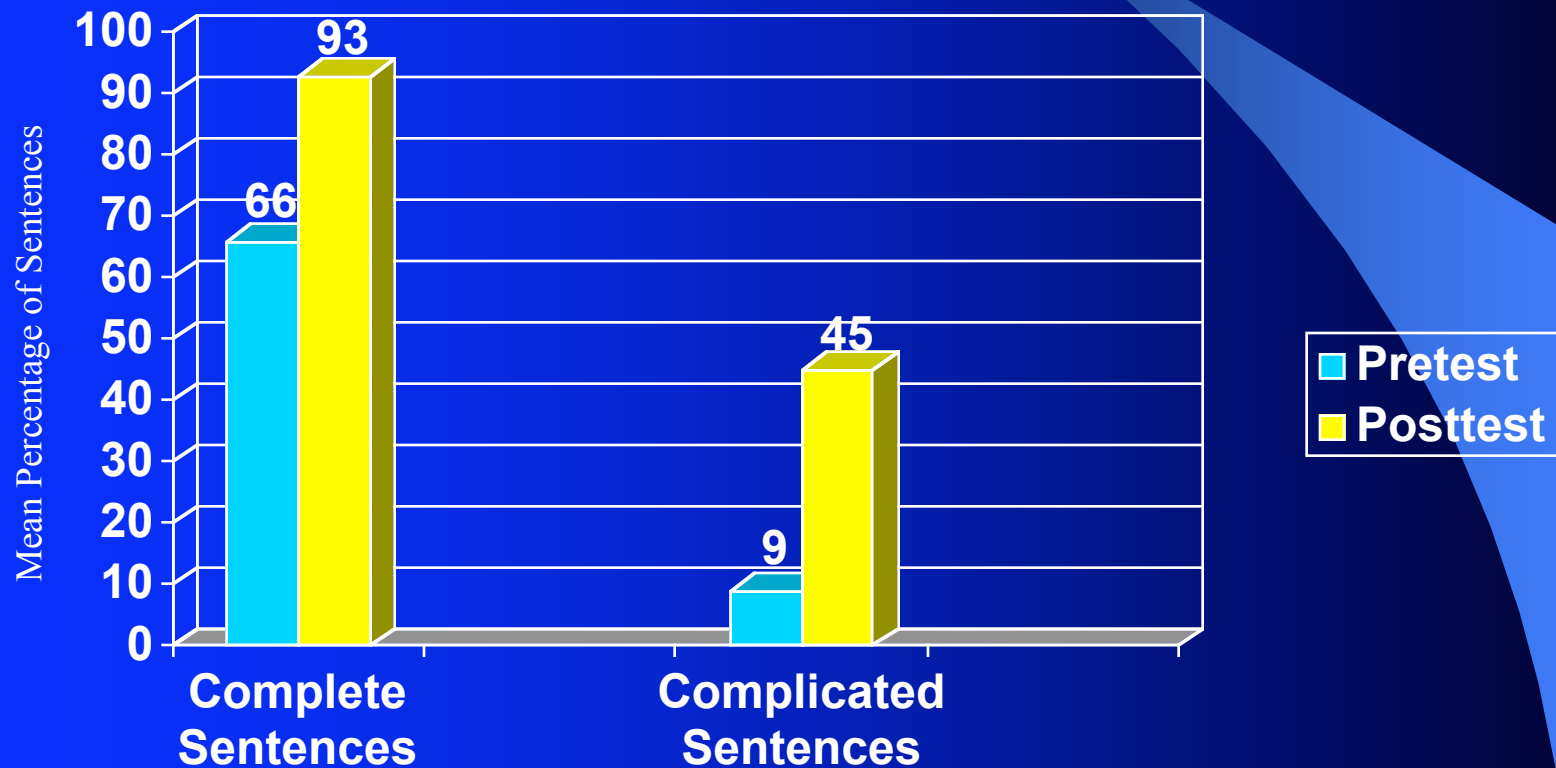
# Comparison of Writing MEAP Over 3 Years

**Muskegon in Relation to Like Districts & State of Michigan**
**Comparisons of Writing MEAP Over 3 Years**
**% Students Passing the Test**

Percentage of Students

| | Class of 1999 | Class of 2000 | Class of 2001 |
|---|---|---|---|
| Muskegon | 94.1% | 92.0% | 93.8% |
| 12 Comparable MI Cities | 79.8% | 78.2% | 85.4% |
| MI Middle Cities | 80.7% | 81.9% | 86.8% |
| State of Michigan | 85.4% | 85.9% | 90.4% |

Legend: Muskegon | 12 Comparable MI Cities | MI Middle Cities | State of Michigan
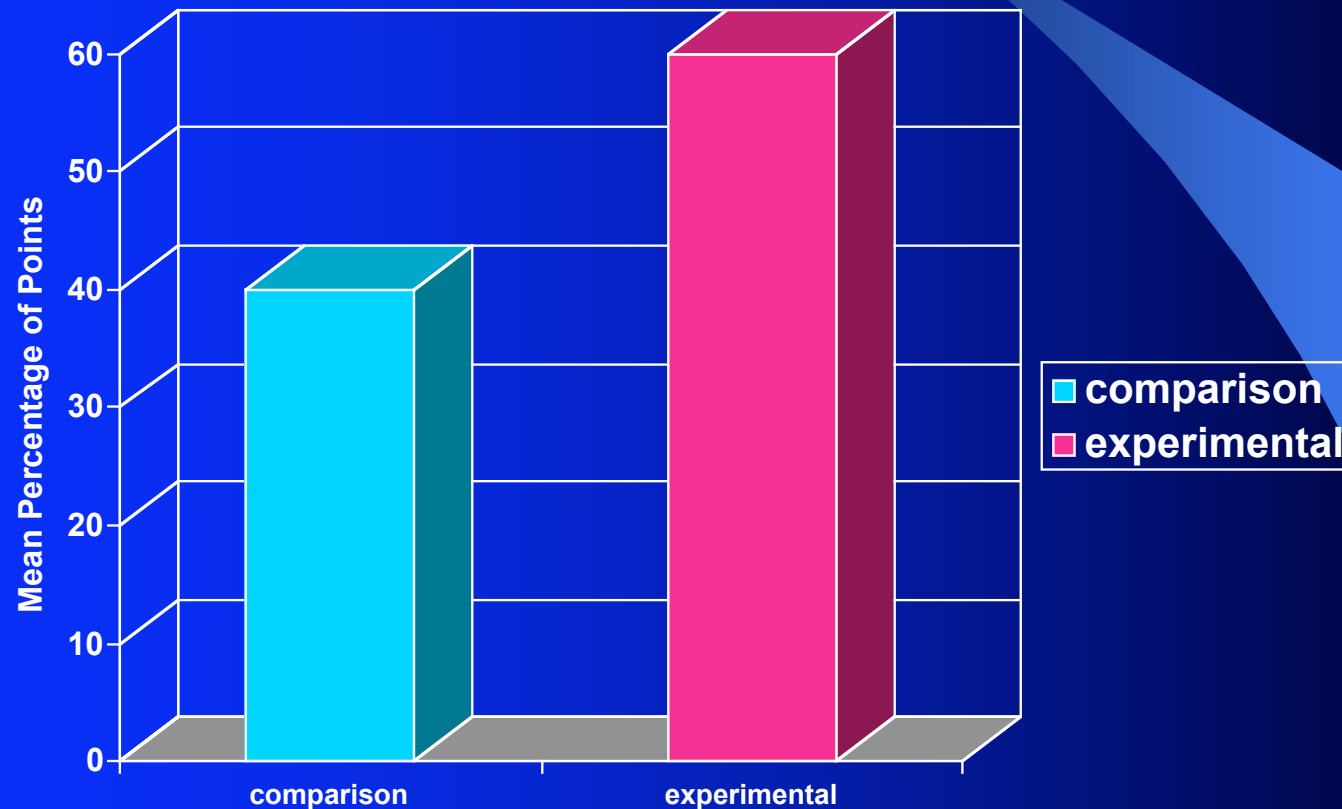
# Self-Questioning Strategy

- **A**ttend to clues as you read

- **S**ay some questions

- **K**eep predictions in mind

- **I**dentify the answer

- **T**alk about the answers
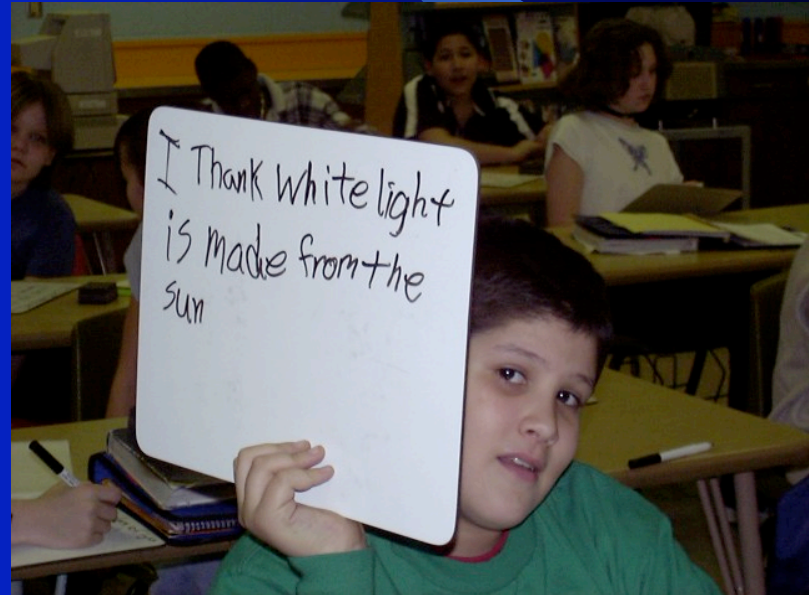
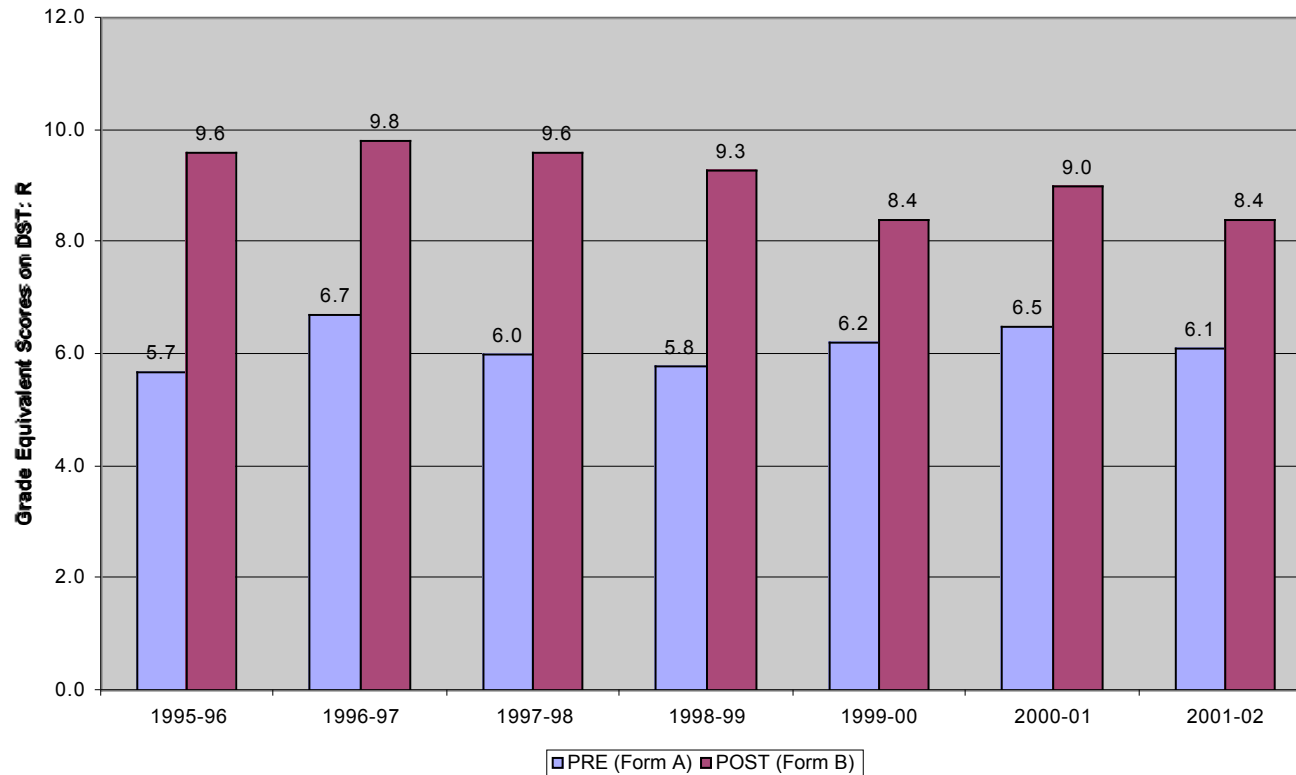# Self-Questioning 7th Grade Science Class Growth Scores

# Word Identification Strategy

- **D**iscover the context
- **I**solate the prefix
- **S**eparate the suffix
- **S**ay the stem
- **E**xamine the stem
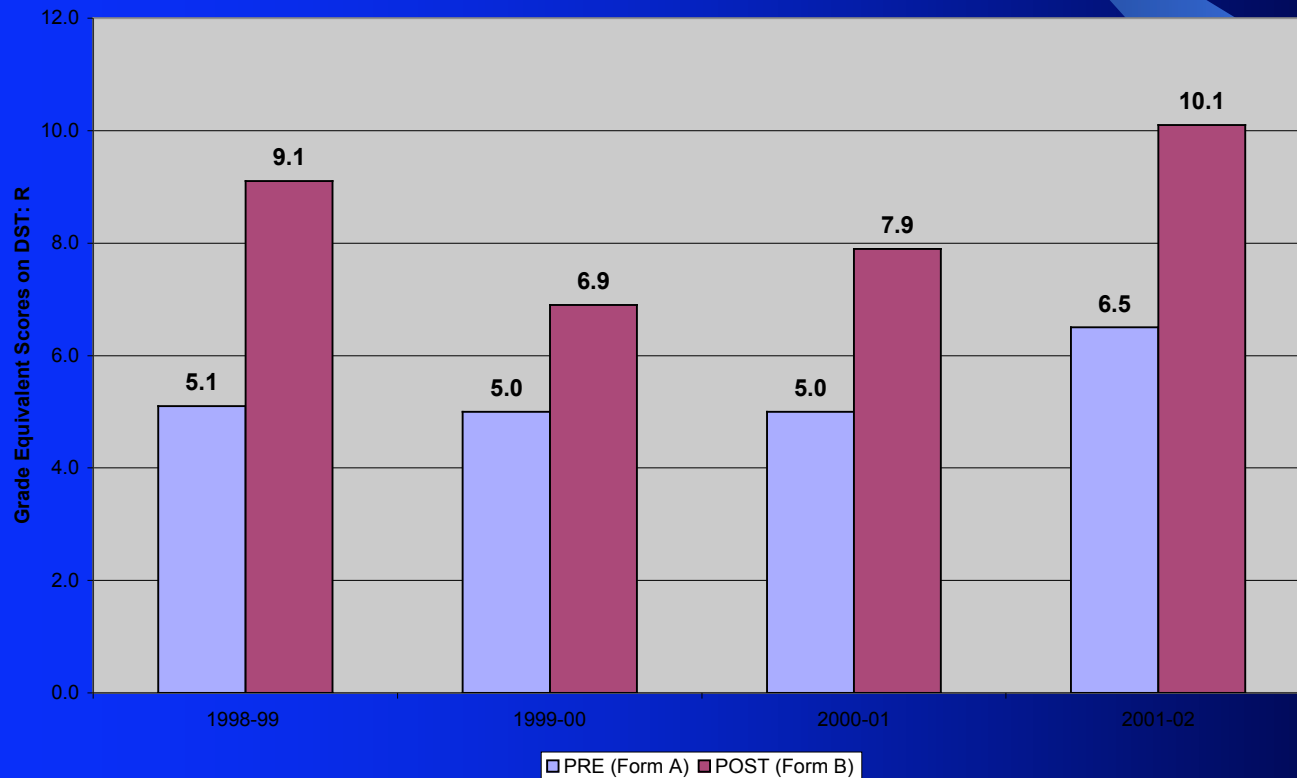- **C**heck with someone
- **T**ry the dictionary

# Word Identification Intervention at MHS



Word Identification Intervention at MHS (9th grade)
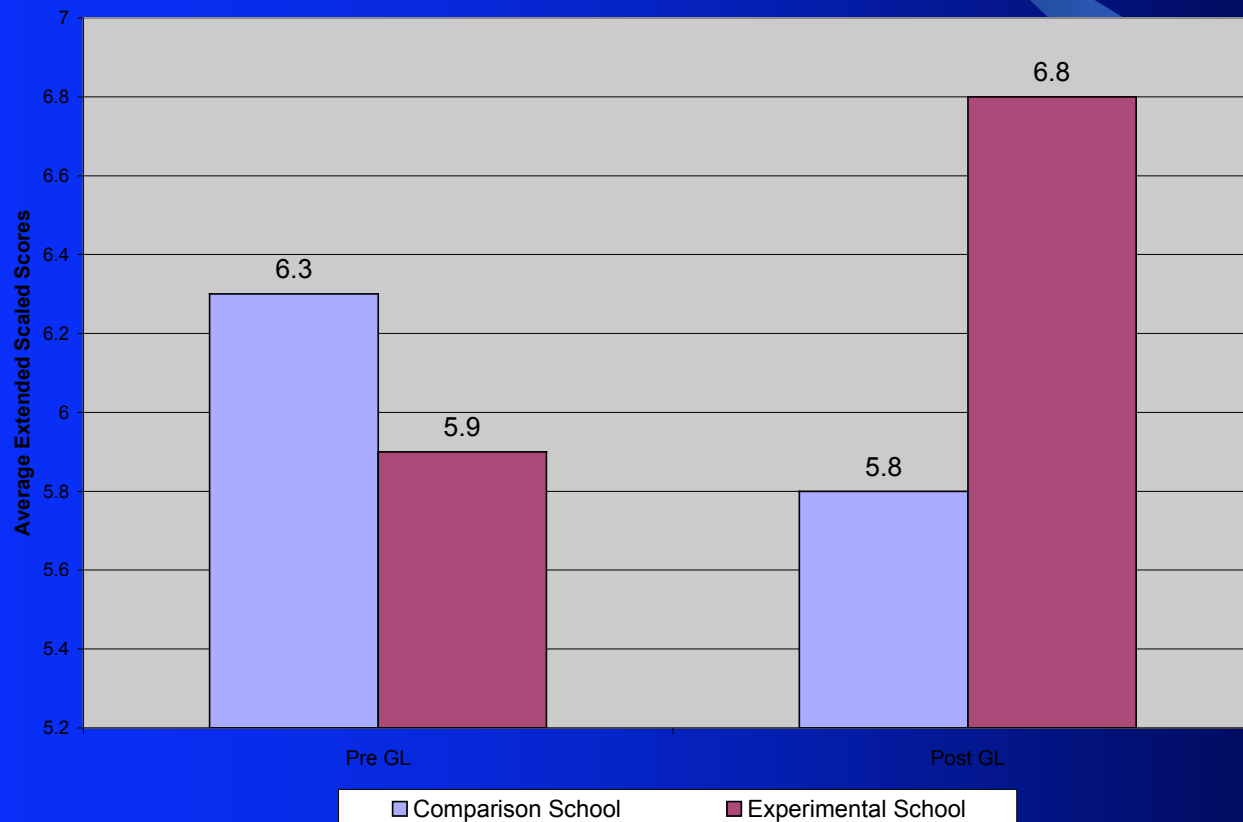ALL STUDENTS (Average # students per year is ~100)

# LD Subgroups in Word Identification Intervention at MHS



LD Subgroups in Word Identification Intervention at Muskegon High School
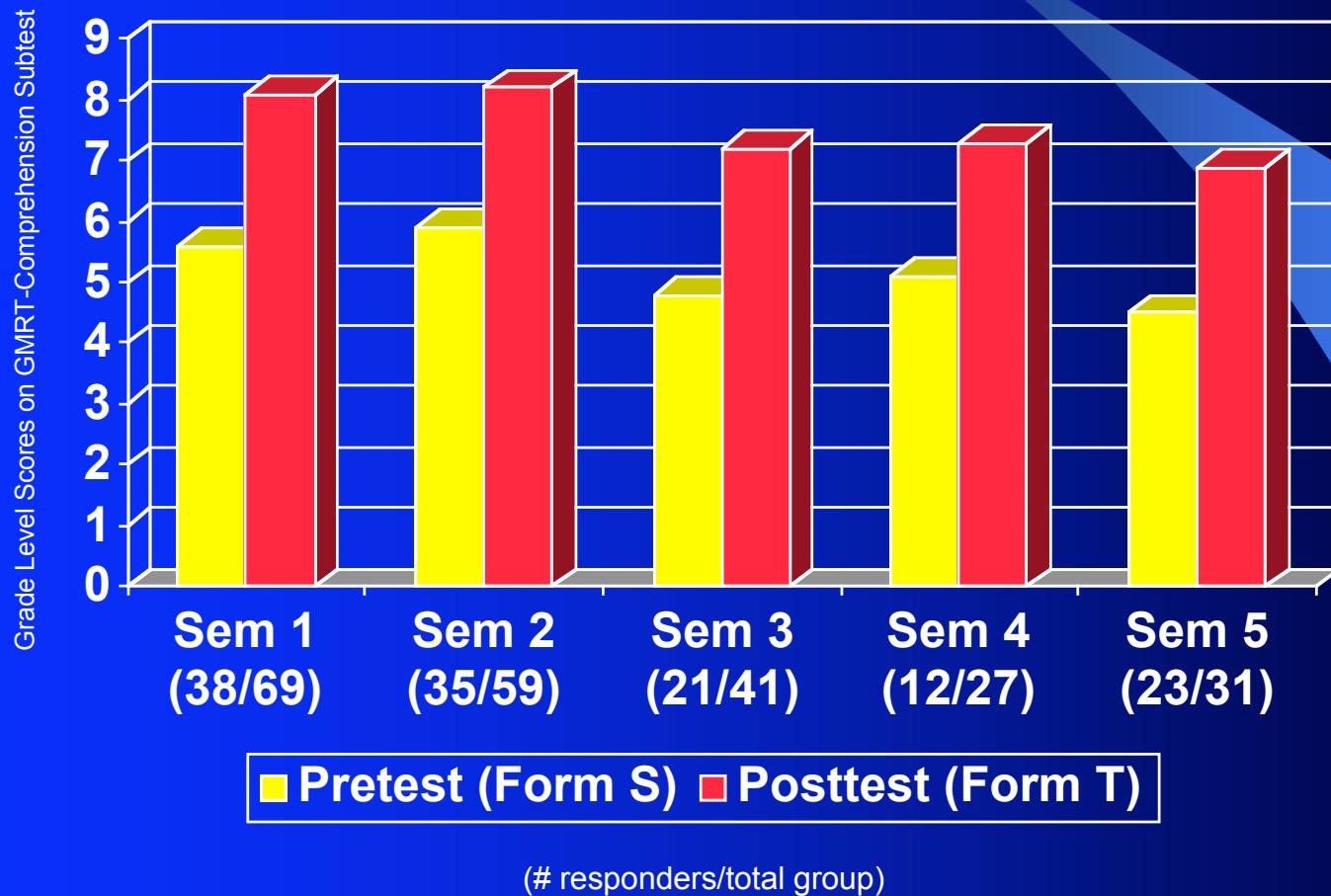Average # LD Students Served ~ 10 (~10% total group)

# Strategic Reading Study: 2002-03

**Strategic Reading Study - 2nd Semester 2002-03**
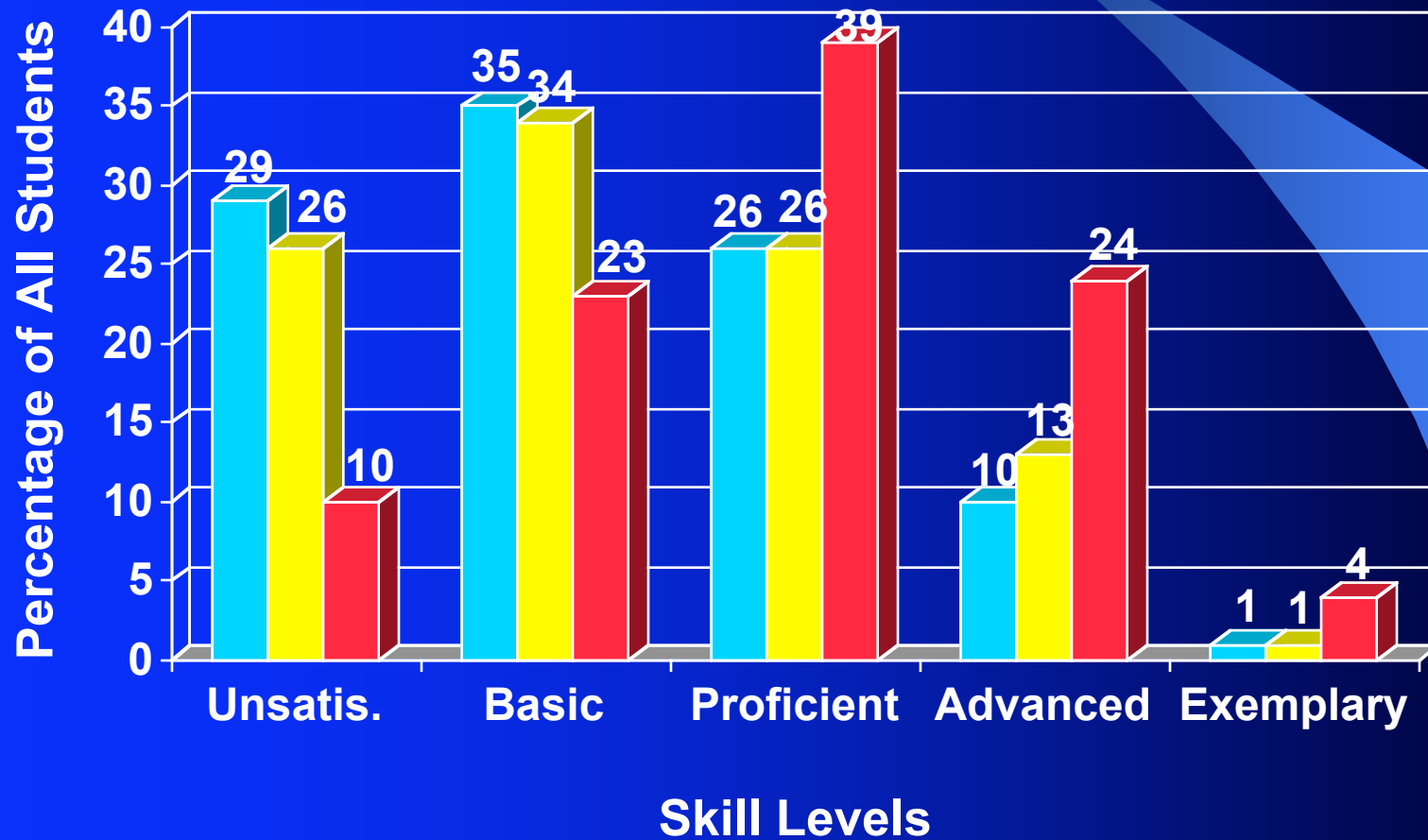Comparison of Pre & Post Testing on Gates-MacGinitie Reading Test (Forms S&T)



Chart: Average Extended Scaled Scores

Pre GL — Comparison School: 6.3, Experimental School: 5.9
Post GL — Comparison School: 5.8, Experimental School: 6.8

Legend: ☐ Comparison School  ■ Experimental School

# Strategic Reading Class at Muskegon High School



(# responders/total group)

# 7th Grade Maryland Functional Tests Results
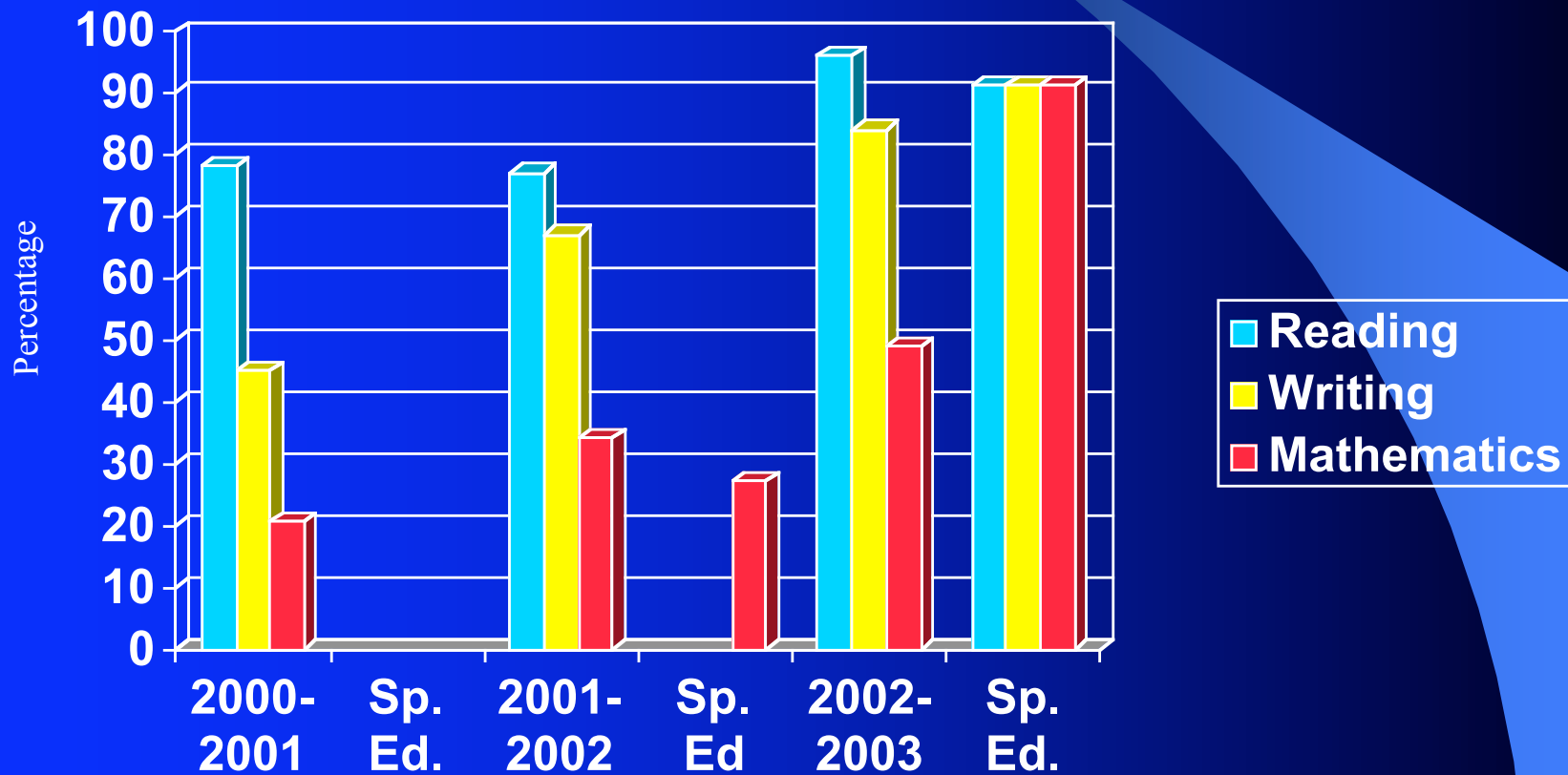
# Vision

# Supports

# STUDENT SUCCESS =

**Validated practices**

**+**

**Fidelity implementation**

**+**

**Coordinated implementation**

**+**

**Quality Professional Development**

**+**

**Strong Administrative Leadership**

# For More Information

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