

## *A Comparison of Teacher Attitudes and Beliefs About Issues in Education Across Conventional and Direct Instruction Schools*

**Abstract:** The purpose of this study was to compare the beliefs and attitudes of teachers in conventional schools versus teachers in schools with implementations of Direct Instruction (DI). Teachers were asked to take sides on statements about classroom practices as well as related educational and professional issues. The results revealed statistically significant differences between groups on all items. The majority of DI teachers agreed with statements that supported explicit teaching practices, whereas the majority of conventional teachers were undecided or balanced on most items. Conventional teachers reserved their strongest support for the relevance of learning style, use of eclectic instruction, and the importance of small class size for academic achievement. Results also revealed important differences between DI and conventional teachers in their attitudes about professional issues.

Unlike other professions such as law or medicine, teaching lacks an agreed upon professional body of empirically-derived practices and principles (Carnine, 1997; Feiman-Nemser & Floden, 1986; Levin & O'Donnell, 1999; Lortie, 1975). In the absence of shared research knowledge, teachers often rely on attitudes and beliefs to guide their teaching practice. These attitudes and beliefs are

acquired from experience or from the shared culture of teaching.

Attitudes and beliefs, however, are not a substitute for research-based practices that promote high achievement. During the past 25 years, liberal and conservative politicians (Rotherham, 2004), business leaders (Symonds, 2001), and parents (Bailey 1997; Robinson, 1998) have expressed frustration with the educational establishment. The popular press is replete with stories about how poorly American students fare in science and mathematics compared to their international peers ("TIMMS 1999 benchmarking highlights," 2001), declining and stagnant scores on the National Assessment of Educational Progress (NAEP) in history (Honawar, 2005) and reading (Manzo, 2001; Manzo & Galley, 2003), the persistent achievement gap between advantaged and disadvantaged children (Hirsch, 2001; Johnston & Viadero, 2000), and the increasing number of students who need remedial classes in college (Cavanagh, 2003).

The reluctance of the educational establishment to change the status quo has added impetus to reform efforts. Critics have advocated for school choice, more accountability, and a renewed commitment to raising academic achievement, especially among traditionally underperforming youngsters. The No Child Left Behind (NCLB) Act of 2001 (U.S.

Congress, 2001) was the culminating political action that put some teeth into the accountability movement.

Critics such as Diane Ravitch (2000) and E.D. Hirsch (1996) argue that education's current demise is rooted in child-centered, progressive approaches to education that have dominated schools of education throughout the twentieth century. So-called progressive education emphasizes child-centered methods—teaching practices designed to foster a student's innate propensity to learn through authentic activities and projects. The teacher is a facilitator—a “guide on the side” rather than a “sage on the stage.” Curriculum is individualized to follow student interests rather than structured to cover certain content, and student progress is measured relative to the individual rather than against absolute or objective standards of achievement. Higher-level thinking is stressed from the beginning, and skill drills and facts are viewed as unnecessary.

Other instructional practices that dovetail with child-centered progressivism include attention to learning styles and use of a variety of approaches (eclectic instruction) to accommodate these learning styles. Ability (skill) grouping is generally viewed as stigmatizing and destructive to motivation, especially to the lower-performing students; self-esteem is considered to be a condition for student achievement. In general, child-centered teaching practices embrace the whole child, and social/emotional needs are emphasized as much as cognitive growth.

The rhetoric of progressive educators has been loud, especially in schools of education, but the classroom reality may be more nuanced. There is some evidence to suggest that teachers are atheoretical (Pinnegar & Carter, 1990) and inconsistent in their beliefs (Brousseau, Book, & Byers, 1987; Richards, 2001). They use a variety of approaches or an eclectic approach to instruction (Baumann, Hoffman, Moon, & Duffy-Hester, 1998; Stahl, Osborn,

& Pearson, 1994; Zalud & Richardson, 1994) presumably to address students' learning styles. In other words, conventional teaching practices reflect neither child-centered progressivism nor explicit, systematic instruction. They are highly idiosyncratic, based on student characteristics, intuition, and experience.

Regardless of whether teachers believe in the child-centered progressivism that is favored by education experts or a more personal adaptation of those teaching practices, there is little to no empirical research that supports their effectiveness and, indeed, achievement data suggest that whatever is going on in classrooms is not working for large numbers of American children. At a time when teachers and educators are being criticized for low student achievement, many people are looking for promising alternatives to conventional teaching practices that leave less to chance.

One of the alternatives to conventional teaching practices is Direct Instruction (DI). Although many people believe that DI is only appropriate for disadvantaged or special education populations, numerous private and charter schools that cater to middle- and upper-class families have embraced DI. DI programs are fundamentally different from conventional curriculum in philosophy, development, design, and implementation. More importantly, they are supported by years of research (Adams & Engelmann, 1996; American Institutes of Research, 1999, 2005; Marchand-Martella, Slocum, & Martella, 2004; Stebbins, St. Pierre, Proper, Anderson, & Cerva, 1977; White, 1988) and have a long history of success.

Although DI curricula bear little similarity to conventional curricula, the teachers who implement the curricula may or may not hold different attitudes and beliefs than conventional teachers. The purpose of this study was to compare the attitudes and beliefs of teachers who work in conventional public schools to teachers who work in schools that use DI. This study asked teachers to “take sides” on a

number of important and timely educational issues. Some of the items addressed teaching practices and related issues, but other items probed attitudes and beliefs about underlying professional issues such as expectations, professional development, and the role of research. This study addressed the following research question: Is there a difference in the attitudes and beliefs of elementary teachers who work in conventional public schools versus teachers in alternative DI schools?

## *Method*

### **Respondents**

Participants in this study consisted of a total of 85 teachers in Wisconsin. Two methods of sample selection were used—one for the conventional teachers and one for DI teachers.

*Conventional teachers.* As part of a larger study, an electronic list of K-12 teachers was obtained from the Wisconsin Department of Public Instruction and a random number generator was used to randomly select 200 names. The sample of conventional teachers consisted of all teachers from Wisconsin who returned the survey and indicated that they were elementary teachers.

*DI teachers.* The sample of teachers from DI schools consisted of all teachers who responded to the survey in participating DI schools. There was no overlap between the two groups.

### **Survey**

A survey was developed by the authors for the specific purposes of this research. The survey consisted of three parts. The first part included demographic items and an example of how to complete the remaining items. The second part contained 12 items in a forced choice continuum format where each end of the continuum presented opposing views on an issue. Respondents were asked to “choose

sides” by circling 1 or 2 if they agreed with the statement on the left and 4 or 5 if they agreed with the statement on the right. They could circle 3 to indicate they were balanced between the two beliefs or undecided.

Questions were modeled after the forced choice format used in surveys conducted by the Public Agenda (e.g., Farkas, Johnson, & Duffett, 1997) but were modified to provide the option of selecting an option in the middle. Table 1 shows the items on the survey as the recipients saw them. This unusual format, rather than a Likert-type scale, was selected because these issues are polarizing. The intent was to force respondents to pick a position or else indicate that they did not have one. Had a Likert-type scale been used listing 28 instead of 14 items, respondents could have agreed with almost all of them given the nature of the statements. Items were deliberately not grouped according to topic and were counter-balanced so that related beliefs appeared on both the left and the right side. The third part of the survey provided a space for comments.

A pilot test was conducted with a heterogeneous group of 35 teachers who were enrolled in a university class for cooperating teachers. Means, standard deviations, and correlation coefficients were calculated on the responses to the pilot survey. Based on comments, some items were reworded. Items were omitted if over 80% of the teachers in the pilot group did not take a position.

### **Procedure**

Two procedures for soliciting participants and returning the survey were used—one for conventional teachers and one for DI teachers.

*Conventional teachers.* Conventional elementary teachers in Wisconsin public schools were surveyed as part of a larger study that included 600 K-12 teachers in Iowa, Minnesota, and Wisconsin. The survey was mailed to conventional teachers during the first week of January. A cover letter and a pre-

**Table 1***Forced Choice Continuum Items As They Appeared on the Survey*

Exactly what I believe	Somewhat like what I believe	I'm balanced between these beliefs	Somewhat like what I believe	Exactly what I believe
1	2	3	4	5
The concept of learning style has little relevance for deciding how and what to teach.			Individual learning styles should be an important factor in deciding how and what to teach.	
The best way to ensure success for all students is to provide authentic learning experiences.			The best way to ensure success for all students is to teach critical skills and concepts directly and systematically.	
Small class size in the early grades is the primary factor leading to higher academic achievement.			Small class size in the early grades is not the primary factor leading to higher academic achievement.	
Self-esteem impacts academic achievement.			Academic achievement impacts self-esteem.	
Accuracy and fluency in basic skills and factual knowledge form the foundation for conceptual understanding and critical thinking.			Conceptual understanding and critical thinking should be emphasized even when students lack proficiency in basic skills or factual knowledge.	
A great teacher cares about students and makes learning fun and interesting.			A great teacher cares about students and produces high student achievement outcomes.	
Ability grouping is inequitable and destructive to motivation.			Ability grouping is necessary to foster success and motivation.	
There is a best way to teach that will be effective with most students.			There is no best way to teach all students; an eclectic or balanced approach to instruction is best.	
Teachers should facilitate learning, rather than teach directly.			Teachers should teach directly, rather than just facilitate.	
Factors (e.g., home life, dyslexia) can prevent children from becoming functionally literate and mathematically competent, regardless of the school's best efforts.			All children (excluding those with severe disabilities) can become functionally literate and mathematically competent.	

paid return envelope were included. The return envelope was coded to monitor returns. Three weeks after the first mailing, a postcard was sent to all teachers on the list reminding them to complete the survey if they had not done so already and giving them contact information if they had misplaced their survey. Three weeks after the postcard was mailed, a second cover letter and survey were sent to all teachers who had not yet returned their survey. Only teachers who indicated that they were elementary teachers in Wisconsin were included in the data analysis for this study.

*DI teachers.* Teachers in DI schools were contacted through the school principal or curriculum coordinator who then distributed the

survey to the teachers and returned the surveys to the first author. The first author contacted five DI schools in Wisconsin that she knew (through personal observation or word of mouth) implemented DI with fidelity. Four out of the five schools contacted chose to participate. Two of the participating schools were charter schools, one was a private school, and one was a public school in a poor urban area.

### Method of Analysis

Descriptive statistics were compiled and a separate one-way analysis of variance (ANOVA) was conducted to identify differences between groups on the survey items and for all the demographic variables.

**Table 1, continued**

*Forced Choice Continuum Items As They Appeared on the Survey*

Exactly what I believe	Somewhat like what I believe	I'm balanced between these beliefs	Somewhat like what I believe	Exactly what I believe
1	2	3	4	5
Instruction should start with teacher modeling and guided practice followed by practice and review.			Instruction should be organized around meaningful activities and projects.	
Experience is more important than education and training for becoming an effective teacher.			Education and training are more important than experience for becoming an effective teacher.	
Following a prescriptive curriculum stifles teacher creativity and reduces student motivation.			Following a prescriptive, but well-designed, curriculum provides the best opportunity for effective instruction.	
Scientifically conducted research is the best guide for determining what and how to teach.			Teaching is more of an art than a science.	

## Results

Forty-five completed surveys were returned from teachers in conventional schools for a return rate of 55%. Forty surveys were completed from the DI schools for a return rate of 92%.

### Demographic Variables

There were no significant differences between groups in educational level, age, gender, or area (general versus special education teachers). There was, however, a difference between groups in years of experience ( $F = 9.695, p = .003$ ) with conventional teachers having more experience than the DI teachers. The mode for years of experience for conventional teachers was 10-20, whereas the mode for DI teachers was 4-9.

### Differences Between Groups on Survey Items

Before the responses were entered for data analysis, the item stems were rearranged so that all statements believed to be philosophically consistent with child-centered progressivism were given a numerical value of 1 or 2, and statements believed to be consistent with DI were given a numerical value of 4 or 5. Table 2 presents the items in that format and shows the percentage who agreed with each position and the percentage who were undecided or balanced.

DI teachers expressed strong support for statements consistent with Direct Instruction and very little support for teaching practices associated with child-centered progressivism. Conventional teachers did not express strong support for either child-centered or teacher-directed methods of instruction. Over half of the respondents indicated that they were undecided or balanced on most items that asked about teaching practices. Conventional teachers reserved their strongest support for learning style (82%), eclectic instruction (86%), and small class size as the primary fac-

tor influencing academic achievement in the early grades (73%). About one third of DI teachers also expressed support for the relevance of learning style and small class size as a primary factor in achievement. However, only one fifth of DI teachers agreed that eclectic instruction was best. A majority of DI teachers believed that achievement impacts self-esteem, whereas a majority of conventional teachers were undecided or balanced.

On professional issues DI teachers were more likely than conventional teachers to believe that (a) great teachers are defined by their ability to produce academic achievement, (b) all children can learn, (c) education and training are more important than experience, and (d) scientifically-conducted research is the best way to determine how and what to teach. What is particularly striking about the descriptive data is that a higher percentage of conventional teachers than DI teachers indicated that they were balanced or undecided by choosing the middle position on almost all items.

A one-way ANOVA revealed significant differences between groups of teachers for all items. Table 3 shows the means, standard deviations, and probability values for all items. Conventional teachers were more likely to have means closer to 2 (indicating that they believed in practices consistent with child-centered progressivism) and DI teachers were more likely to have means closer to 4 (indicating that they believed in practices consistent with DI).

### Variance Within Groups

The large standard deviations on some items for the group of DI teachers prompted an analysis of differences by demographic variables within groups. Although no differences existed among conventional teachers, numerous differences were found among DI teachers for educational level and years of experience.

*Educational level.* A Tukey HSD post hoc analysis revealed statistically significant differences

**Table 2**  
*Comparison of Agreement With Beliefs Between Teachers  
in Conventional Schools Versus DI Schools*

Belief (1 or 2)	Agree		Belief (4 or 5)	Agree		Undecided or Balanced (3)	
	Conv	DI		Conv	DI	Conv	DI
Teaching practices			Teaching practices				
Authentic learning	33%	33%	Systematic instruction	9%	66%	58%	1%
Conceptual understanding	24%	15%	Basic skills	38%	76%	62%	9%
Facilitate	44%	13%	Teach directly	7%	75%	51%	12%
Activities and projects	18%	0%	Modeling and guided practice	33%	85%	49%	15%
Curriculum stifles creativity	22%	3%	Curriculum provides best opportunity	49%	90%	29%	7%
Ability grouping harmful	26%	3%	Ability grouping necessary	35%	95%	39%	2%
Related issues			Related issues				
Learning style relevant	82%	37%	Learning style irrelevant	2%	43%	16%	20%
Eclectic instruction best	86%	20%	There is a best way	9%	73%	5%	7%
Small class size primary	73%	38%	Small class size not primary	16%	50%	11%	12%
Self-esteem impacts achievement	38%	24%	Achievement impacts self-esteem	4%	51%	58%	25%
Professional issues			Professional issues				
Fun and interesting	38%	8%	High achievement	4%	54%	58%	38%
Factors prevent learning	27%	20%	All children can learn	47%	73%	26%	7%
Experience	51%	23%	Education and training	2%	40%	47%	37%
Art	42%	5%	Scientifically conducted research	13%	70%	45%	25%

**Table 3**

*Means and Standard Deviations for Teachers in Conventional Schools and Teachers in DI Schools, and Probability Values for Differences in Means*

	Conventional n = 45	DI n = 40	<i>p</i>
<b>Teaching practices</b>			
Authentic learning vs. systematic instruction	2.64 (.88)	4.13 (.99)	.000
Conceptual understanding vs. basic skills	3.16 (1.11)	4.15 (1.30)	.000
Facilitate vs. teach directly	2.47 (.93)	4.13 (1.20)	.000
Activities vs. modeling and practice	3.29 (1.12)	4.50 (.75)	.000
Curriculum stifles vs. provides opportunity	3.36 (1.07)	4.50 (.75)	.000
Ability grouping harmful vs. necessary	3.09 (.97)	4.63 (.67)	.000
<b>Related issues</b>			
Learning style relevant vs. irrelevant	1.71 (.82)	3.20 (1.36)	.000
Eclectic instruction best vs. one best way	1.68 (1.07)	3.93 (1.27)	.000
Small class size primary vs. not primary	2.09 (1.10)	3.61 (1.48)	.000
Self-esteem first vs. achievement first	2.40 (1.07)	3.61 (1.48)	.000
<b>Professional issues</b>			
Fun vs. achievement	2.40 (.94)	3.82 (1.10)	.000
Factors prevent vs. all children learn	3.31 (1.18)	3.93 (1.27)	.024
Experience vs. education and training	2.36 (.86)	3.23 (1.23)	.000
Art vs. science	2.62 (.98)	4.08 (1.10)	.000



( $p < .05$ ) among DI teachers by educational level for Items 6, 9, 10, and 14. DI teachers with a Master's degree or Master's degree plus were more likely than teachers with a Bachelor's degree to agree that (a) great teachers produce high achievement outcomes, (b) teachers should teach directly rather than facilitate learning, (c) all children can learn, and (d) scientifically-conducted research should determine best practices.

*Age.* There were differences for age for both conventional and DI teachers for the item having to do with whether or not all children could become functionally literate and mathematically competent. Among conventional teachers, teachers over 50 years of age were less optimistic than younger teachers, although a post hoc analysis did not reveal statistically significant differences. Among DI teachers, the opposite was true. Older teachers were more convinced than younger teachers that all children can learn. A post hoc analysis with Tukey HSD revealed that the mean difference between teachers over 50 years of age and teachers 20-29 was statistically significant at the .05 level. Agreement that all children can learn increased with age among DI teachers as shown by the following data (agreement that all children can learn is indicated by a mean closer to 4 or 5): teachers age 20-29 ( $M = 2.67$ ,  $SD = 1.0$ ), age 30-39 ( $M = 3.92$ ,  $SD = 1.26$ ), age 40-49 ( $M = 3.67$ ,  $SD = 1.41$ ), and over 50 ( $M = 4.78$ ,  $SD = .44$ ).

*Years of Experience.* A Tukey HSD post hoc analysis revealed statistically significant differences ( $p < .05$ ) among DI teachers by years of experience for Items 2, 4, 6, 9, 10, 11, and 14. DI teachers with 10-20 or over 20 years of experience were more likely than those with 1-3 years of experience to believe that (a) skills and concepts should be taught directly and systematically, (b) achievement impacts self esteem, (c) great teachers produce high achievement outcomes, (d) teachers should teach directly rather than facilitate, (e) all children can learn, (f) instruction should begin

with modeling and guided practice, and (g) scientifically-conducted research should guide practice. Table 4 shows the incremental increase in agreement with statements with additional years of experience.

## *Discussion*

This study yielded four interesting findings that merit consideration. First, although the differences in beliefs about child-centered teaching practices were predictable, the degree of certainty expressed by the DI teachers compared to conventional teachers was surprising. For the most part, DI teachers knew what they believed about teaching practices and other related issues, whereas conventional teachers seemed uncertain. Second, fewer than half of DI teachers believed in the issues that garnered the most support among conventional teachers—learning style, eclectic instruction, small class size as the primary determinant of achievement and, to a lesser extent, self-esteem as a precondition for achievement. The third issue had to do with differences in teachers' attitudes toward professional issues. Teachers' perceptions of what makes great teachers, their expectations for student success, and the relative value they place on training and scientific research have important implications for educational reform. Finally, one has to wonder if the profound differences in beliefs are a cause or a result of working in a DI school. That is, were the DI teachers unconventional before they started teaching in those schools or did their experiences and training shape their beliefs? The variability of responses between novice and more experienced DI teachers provides some clues.

Teachers in DI schools overwhelmingly favored teaching practices that were explicit and systematic. Ninety percent agreed or strongly agreed that a prescriptive and well-designed curriculum provides the best opportunity for students to learn. Although DI programs require teachers to follow a script, apparently

they do not believe their creativity has been stifled. Ninety-five percent of DI teachers believed that ability (skill) grouping fosters success and motivation, which is not surprising since DI relies on flexible grouping to keep students at an appropriate instructional level. These results were predictable, but the strong consensus among DI teachers provided a contrast to conventional teachers.

It appeared that conventional teachers did not know what they believed about the best way to teach. They expressed support for practices that were consistent with child-centered progressivism (e.g., teachers should facilitate learning, rather than teach directly) and also with explicit instruction (e.g., following a prescriptive, but well-designed, curriculum provides the best opportunity for effective instruction). On all but one of the pedagogy items, more than half of the elementary teachers took the middle position. Although the middle position could mean either balanced or undecided, the dichotomies about teaching practices represented fundamentally different perspectives that are somewhat incompatible, suggesting they were more undecided than

balanced, at least about how to teach. These results suggest that many conventional teachers may be guided more by contextual factors (such as student characteristics or curriculum availability) or intuition than by any conviction about best teaching practices.

This interpretation is consistent with the results of a study in which Latham (2002) asked 20 randomly selected engineers, physicians, lawyers, and educators to describe a problem that they commonly encountered in their work, explain how they would go about solving the problem, and what formed the basis for their solution. Engineers referred to laws, principles, and formulas related to physics. Physicians generally referred to their knowledge of physiology, anatomy, microbiology, and chemistry. Lawyers referred to constitutional law, statutes, precedent, and logic. Educators gave responses such as “It seemed at the moment to be a good way to handle the situation” or “I don’t really know, I never thought much about it” (p. 15). Teachers’ answers suggested that their actions were not based on shared rules or standards for effective practices.

**Table 4**

*Differences in Means by Years of Experience for DI Teachers for Selected Items*

Years	N	Teach directly and systematically		Accuracy and fluency in basic skills		There is a best way to teach	
1-3	14	3.29	(1.20)	2.64	(1.22)	2.71	(1.07)
4-9	17	3.53	(1.28)	3.41	(1.42)	3.56	(1.15)
10-20	12	4.42	(.90)	3.92	(1.56)	4.08	(.9)
20+	7	4.86	(.38)	4.43	(.98)	4.17	(.98)

Although conventional teachers expressed mixed beliefs about teaching practices, they were more unified in their support for learning style, eclectic instruction, and small class size. DI teachers expressed less support than conventional teachers about the relevance of learning style and fewer than 20% of DI teachers believed in eclectic instruction. The notion of learning style and eclectic instruction go hand in hand since an eclectic approach is often viewed as a way to accommodate individual learning styles. Stanovich and Stanovich (2000) concluded that although learning style “does seem to have some face validity . . . it has never been shown to work in practice” (p. 30). Historically, reviews of the literature have failed to support the idea of matching instruction to particular learning styles (Kampwirth & Bates, 1980; Kavale & Forness, 1987; Stahl, 1988; Tarver & Dawson, 1978). The application of learning style to beginning reading is particularly worrisome because it suggests that children who are not “auditory learners” should not receive phonics instruction (Snider, 1992; Stanovich & Stanovich, 2000). Excluding visual, tactile, and kinesthetic learners from phonics instruction

goes against the research-based recommendations of the National Reading Panel (National Institute of Child Health and Human Development, 2000), which recommended explicit, systematic phonics for all students.

Eclectic instruction is another intuitively appealing idea that may result in less, rather than more, effective instruction. Heward (2003) described six potential problems with the eclectic approach. First, not all approaches are equally effective. Second, teachers may unknowingly pick and choose some of the ineffective components of a particular model. Third, some strategies or components may not be effective unless they are implemented as part of a whole package. Fourth, elements of one program may be incompatible with elements of another. Fifth, using a mix of approaches may limit the sustained and systematic use of an approach that is necessary to obtain results. Finally, an eclectic teacher who uses multiple methods may not use any of them with enough skill to produce results. Since eclectic instruction is, by definition, idiosyncratic, it does not lend itself to experimental research. Follow-up studies of compre-

**Table 4**

*Differences in Means by Years of Experience for DI Teachers for Selected Items*

Teach directly rather than facilitate	All children can learn	Modeling and guided practice	Scientifically conducted research
2.92 (1.26)	2.46 (.97)	3.85 (.80)	3.00 (1.0)
3.65 (1.22)	3.76 (1.35)	4.18 (1.13)	3.65 (1.17)
4.67 (.89)	4.67 (.49)	4.83 (.39)	4.67 (.65)
4.29 (1.5)	4.67 (.52)	4.57 (.79)	4.57 (.79)

*Note.* 3.0 indicates undecided or balanced. 4.0 indicates agreement with the statement. 5.0 indicates strong agreement.

hensive school reform models, however, suggest that efforts to turn around failing schools are most successful when a specific curricular model is implemented in its entirety strictly as designed and that schools that try to adopt bits and pieces of various models are not successful (Brock & Groth, 2003).

Seventy-three percent of conventional teachers believed that small class size is the primary factor leading to higher achievement in the primary grades, compared to 38% of DI teachers. Surveys consistently indicate that teachers strongly favor class size reduction (Johnson & Duffett, 2003; National Education Association, 2000-01). No one doubts that small classes are desirable; the question is whether or not small class size, in and of itself, raises achievement enough to make it worth the cost.

Class size has been the subject of several large-scale research studies. The Student Teacher Achievement Ratio (STAR) study in Tennessee used random assignment of children in an attempt to determine if reducing class size from 24 to 15 would result in higher achievement (Zurawsky, 2003). The STAR study indicated that small class size resulted in statistically significant improvements in reading and mathematics especially for students who participated in small classes in kindergarten and first grade. The results were especially notable for at-risk students.

Unfortunately, when California legislators spent \$5 billion to achieve the same results, the results were disappointing (Ehrenberg, Brewer, Gamoran, & Willms, 2001). It seems likely that small class size provides the potential for higher achievement, but it is not a magic bullet that can produce higher achievement in the absence of effective teaching practices and aligned curricula.

DI teachers also were much more likely than conventional teachers to believe that achievement impacts self-esteem rather than the other way around. In fact, a recent review of the literature on the importance of self-esteem

confirms this view. Researchers concluded that the modest correlations between school achievement and self-esteem indicated that high self-esteem is at least partly the result of academic performance and that efforts to boost self-esteem are not effective (Baumeister, Campbell, Krueger, & Vohs, 2003).

The practices for which conventional teachers expressed the most support—learning style, eclectic instruction, small class size, and self-esteem as a condition for achievement—are not supported by empirical research. A little over one third of DI teachers favored the notion of learning style and small class size, far less than the 75%-85% among conventional teachers. Conventional and DI teachers also diverged in their attitudes toward professional issues.

The issue of what defines a great teacher—interesting activities or high achievement—understandably drew a lot of teachers to the middle, but conventional teachers had a clear preference for fun and interesting activities, whereas DI teachers had a clear preference for high student achievement outcomes.

Seventy-three percent of DI teachers agreed that all children (excluding those with severe disabilities) can become functionally literate and mathematically competent, including 45% who strongly agreed. Forty-seven percent of conventional teachers agreed but only 18% strongly agreed. Interestingly, among DI teachers there was greater agreement that all children can learn among older compared to younger teachers, whereas the opposite was true among conventional teachers. This finding is consistent with previous research indicating that many teachers have reservations about their ability to reach all students. More than 15 years ago, Brousseau and Freeman (1988) found that 50%-87% of teachers agreed that “no matter how hard they and their teachers try, some students who are placed in regular classrooms will never master all of the basic skills in reading and mathematics” (p. 269). If teachers do not believe that all children can learn, it would

seem to undermine efforts to achieve equity in education for low-performing students including those groups targeted in NCLB—students with disabilities, second-language speakers, and students of poverty. The importance of high expectations, or more precisely the damage that can be caused by low expectations, has been well documented (Good, 1982, 1987). High expectations for student success form the philosophical underpinnings of DI—low academic performance is largely the result of teaching failures, not student failures.

Both conventional and DI teachers expressed ambivalence about the relative value of experience compared to education and training. Only 2% of conventional teachers and 40% of DI teachers chose education and training over experience. Reliance on experiential learning over formal training seems to be part of the culture of teaching. Teachers in Ontario, Canada rated on-the-job experience as the primary way that they acquire skills (COM-PASS, Inc., 2003). Despite teachers' belief that they learn best from experience, there is evidence that the experience of most teachers is "noneducative at best and miseducative at worst" (Lanier & Little, 1986, p. 565). Personal experience and discovery are notoriously unreliable, and professional knowledge enables a person to interpret events insightfully and learn from experience.

There are two ways to interpret this result. It could be that teachers really do believe that experience and intuition can provide everything they need to know about teaching. If this is true, it suggests that teachers (and perhaps the general public as well) do not perceive that what teachers do is difficult enough to warrant training. A second possibility is that teacher training as it currently exists is not useful. That is, teachers' agreement that experience is more useful than education and training reflects the reality rather than the possibilities.

The National New Teacher Study (Meister & Melnick, 2003) found that new teachers felt

unprepared to handle disruptive students and students with special needs, and 40% of elementary teachers said they felt ill-prepared to teach reading. Other evidence also suggests that teachers do not perceive their education and training as useful. Many teachers indicate that teacher certification programs do not adequately prepare new teachers and they are critical of inservice training (Farkas, Johnson, & Duffett, 2003). The fact that DI requires extensive initial and ongoing training and professional development may make many of those teachers feel more positive about how formal training can make them better teachers. Many DI teachers, however, have not forgotten that their initial teacher preparation was inadequate.

One of the most startling differences between the two groups of teachers was their attitude toward scientifically-conducted research. Understandably, many teachers were balanced between the "art" and "science" of teaching, but conventional teachers with an opinion favored the "art" by more than 3 to 1. DI teachers overwhelmingly favored research. DI curricula are supported by decades of experimental research and the message that research matters is a consistent theme among advocates.

Evidence about teaching practices is both necessary (Slavin, 2002) and available (Stanovich & Stanovich, 2000; Traub, 2002), but even when a knowledge base exists the teaching profession ignores the evidence (Carnine, 2000). The fact that only 13% of conventional teachers agreed that scientifically-conducted research should determine best practice certainly supports Carnine's observation that educators tend to ignore empirical research.

DI teachers seem to have beliefs conducive to meeting the goals of NCLB. They have a clear focus on academic achievement, high expectations for the success of all students, an appreciation of the need for training, and respect for scientifically conducted research. Although almost half of conventional teachers believe

that all children can learn, they may have a hard time achieving that ideal without more emphasis on academic achievement rather than fun and interesting activities and a greater appreciation for the need for professional development and scientifically-conducted research.

Teachers in DI schools had different views of best practice and educational issues compared to conventional teachers. But how did they get that way? They sat in conventional classrooms for 12 or more years of their lives as students. They went through teacher certification programs where they observed conventional teaching practices modeled in public schools during their field experiences and, with some exceptions, they learned from their teacher education professors that child-centered methods were good and teacher-directed methods, like DI, were problematic.

There is little consensus about the origins of teacher beliefs. In his classic sociological study of the teaching profession, Lortie (1975) emphasized the impressions formed during the "apprenticeship of observation" (p. 81). That is, teacher beliefs may be passed down from one generation of teachers to the next during an individual's 13 years of public education. Another factor in the acquisition of teacher beliefs seems to be a process of socialization with experienced teachers (Feiman-Nemser & Floden, 1986). Teacher beliefs are difficult to change. Bird, Anderson, Sullivan, and Swidler (1992) attempted to challenge preexisting beliefs of students in an introductory education course. They found that preservice teachers' beliefs were deeply rooted in their own school experiences and resistant to change. Interestingly, Brousseau and Freeman (1988) found that teacher candidates were more likely than non-education majors to agree with "expert opinions" of education professors even before they had an education class suggesting that adolescents who pursue a teaching career may already share many beliefs common to the culture of teaching.

Although much of the research on teacher beliefs presumes that beliefs precede practice and that beliefs should determine classroom practice (see, for example, the Teacher Beliefs Study by Woolley & Woolley, 1999), the results of this study suggest another possibility. The consistent progressive trend in means for DI teachers with more years of experience supports the idea that the education and training they received working in a DI school and the resulting success they experienced as a teacher were critical factors in changing their beliefs.

The beliefs and attitudes of teachers with 1-3 years of experience were probably influenced by the child-centered progressive messages they got in their recent undergraduate teacher certification program. In addition, they have few teaching experiences with which to compare their current level of success with DI. On the other hand, teachers with more experience typically come to DI after experiencing the ineffective models present in most conventional school settings. They realize that the rhetoric of child-centered approaches does not match the classroom reality. Their beliefs and attitudes may change as a result of their increasing knowledge about effective teaching practices and sense of self-efficacy that result from students' academic successes. The results of this survey suggest that no similar changes in attitudes and beliefs occurred as a result of experience or education among conventional elementary teachers.

Despite the interesting findings in this study, there were two limitations. The first had to do with the survey instrument. Some teachers appeared to be confused by the format because they wanted to treat it as a Likert-type scale. Although the forced-choice format yielded more information than a Likert-type scale, its validity has not been well established. In addition, the results would have been easier to interpret had the survey been designed to differentiate between a middle choice that meant "undecided" versus "balanced." Future studies should address the reli-

ability and validity of forced-choice surveys such as this one.

Interpretation of the study was also limited by the fact that a different procedure was used to sample the conventional versus DI teachers. The conventional teachers consisted of a random sample of teachers from public elementary schools who received the survey in the mail and returned it yielding a response rate of 55%. The DI teachers taught at exemplary DI schools and, because the survey was collected and distributed by an administrator, the response rate was 92%. The question is whether the procedures that produced a differential response rate made the samples non-representative of the population. For the results to be considered valid, one group must represent average teachers in conventional public schools and the other group must represent average teachers in effective DI schools.

In conclusion, this study found important differences between conventional elementary teachers and teachers in DI schools in terms of beliefs about best teaching practices and professional issues. DI teachers expressed strong support for teaching practices consistent with DI. They expressed less support than conventional teachers for issues unrelated to teacher behaviors such as the importance of small class size and the relevance of learning style. DI teachers, especially those with more experience, valued achievement outcomes, believed in the potential for all children to become functionally literate and mathematically competent, and recognized the need for curriculum and methods to be validated through research.

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