Literature Review

Teaching for Learner Differences

Today's teachers face many challenges in the classroom. We live in an era where schools are accountable for the learning of all students (regardless of their background). Teachers are expected to provide a rigorous and relevant core program while also providing supplemental and intensive levels of support for students whose needs are not being met by core. This includes students who are struggling to meet minimum competencies as well as students who have instructional needs that extend beyond grade level expectations. To ensure that all students are receiving the instruction they need to be successful, it is important to consider the research and best practice regarding teaching for learner differences. This document summarizes much of the research in the field of diverse learners, organized around four essential questions:

- What are learner differences?
- Why teach for learner differences?
- How are learner differences addressed as part of the educational system?
- What are the best methods of instruction to address learner differences?

What Are Learner Differences?

Historically, subgroups have been used to describe learner differences, as if understanding the category to which one belongs would "explain" strong or weak academic performance. Socioeconomic status, ethnicity/culture, gender, cognitive ability, disability status, and English language learners have all been cited as reasons for diverse levels of academic performance. Current research challenges educators to think beyond this historical perspective.

Socio-economic status has been thought to explain why, on average, children from impoverished backgrounds underperform when compared to children from non-impoverished backgrounds (Howard, Dresser, & Dunklee, 2009). However, not all low performers are from impoverished backgrounds, and not all children in poverty are low performers.

Culture, ethnicity, and race have all been used to characterize learner differences. Children develop certain learning preferences and ways of learning, in part, because of their experiences within their cultural or ethnic group. Race, as a subgroup, is often used to characterize a learner difference, as if the performance of all students within a racial group can be explained simply by examining skin color (Losen & Orfield, 2005). According to the National Center for Education Statistics (2009), Hispanic and African-American students are less likely to score proficient on academic achievement measures, than Asian and Caucasian students. This does not mean, however, that all low performers are from specific cultural/ racial/ ethnic subgroups, and not all children within those specific subgroups are low performers.

Gender is often used as a category to explain learner differences. Gurian, Stevens, and King (2008) write about differences in the way boys and girls learn. They cite research from Baron-Cohen that notes the existence of a "wide spectrum of male and female brains as well as the existence of males and females in middle of that spectrum" (p. 14). As a subgroup, elementary school-aged girls tend to perform lower than boys on mathematics achievement tests (National Center for Education Statistics, 2009). This does not mean, however, that all elementary school-aged girls have low mathematic achievement scores, and all elementary school-aged boys have high mathematic achievement scores.

According to the National Center for Education Statistics (2009), test results of students whose dominant language is not English tend, as a group, to reflect lower percentages of proficient performance than students whose dominant language is English. However, not all English language learners fail to meet proficiency standards.

The reality is, regardless which subgroup students belong to, every student comes to school with wide variations in background knowledge, strengths and preferences, skills and levels of family support and involvement. Not all learners within a particular subgroup will learn best in the same way. Teaching for learner differences requires that teachers assess each student's unique learning needs and then respond by planning and facilitating instruction that supports their learning strengths and allows them to grow in areas of weakness.

Why Teach for Learner Differences?

In the introduction to his book, *The Global Achievement Gap*, Tony Wagner (2009) reports that most students will need some education beyond high school in order to have enough income to live in today's economy, yet many are not prepared for the world of work after graduating from high school. Wagner's research included surveys and interviews of business leaders and employers as well as observations of hundreds of classrooms across the nation. He summarized the following statistics in the introduction:

- "The high school graduation rate in the United States- which is about 70% of the age cohort- is now well behind that of countries such as Denmark (96 percent), Japan (93 percent), and even Poland (92 percent) and Italy (79 percent)" (p. xix).
- "Only about a third of U.S. high school students graduate ready for college today, and the rates are much lower for poor and minority students" (p. xix).
- Approximately 85 percent of current jobs and almost 90 percent of the fastest-growing and best-paying jobs now require postsecondary education.
- In the 25-44 age group, the U.S. now ranks 10th among industrial nations in our college completion rate.
- Of the 400 plus employers surveyed regarding "readiness for work", less than 25 percent reported that new employees with four-year college degrees have "excellent" basic knowledge and applied skills.
- Almost 50 percent of employers, who hire graduates right out of high school, said that their overall preparation was "deficient."

Through his research, Wagner identified what he refers to as a significant "disconnect" between what is provided to students in schools and what potential employers need in the work world including: critical thinking skills, creativity, and effective communication.

Wagner suggests that effective communication, curiosity, and critical thinking skills, are "essential competencies and habits of mind for life in the 21st century" (p. xxiii). He goes on to suggest, "The simplest explanation for the low level of intellectual work and general lack of curiosity found in classrooms—even in our best high schools—is that our schools were never designed to teach all students how to think. Since our system of public education came into being at the turn of the last century, the assumption has been that only those in the college preparatory classes were going to have to learn how to reason, problem-solve, and so on, and historically this was only a small percentage of students. Even students in these classes often learned such skills in school more by accident than design. For the most part, teachers have not been trained to teach students how to think. The textbooks and tests we have used in the past were not designed to teach and assess the ability to reason or analyze-and they remain substantially the same today" (pp. xxiii-xxiv).

Through the era of No Child Left Behind, the United States Department of Education has clarified that all students "get" the general curriculum, and that as part of general programming, all students deserve large-group and small-group instruction without having to resort to IEP services (unless the child has a disability) (United States Department of Education, August 2009).

Educators need to be innovative in understanding where all students are academically and behaviorally in order to prepare them to participate and succeed in the global economy of the twenty-first century and beyond. All students need to leave school with skills that provide a range of opportunities for living, learning, and working.

How Are Learner Differences Addressed as Part of the Educational System?

"Public school educators in the United States are now required to do something they have never before been asked to accomplish: ensure high levels of learning for all students. This mandate is not only unprecedented; it is at odds with the original goal of schools. The notion of all students learning at high levels would have been inconceivable to the pioneers of public education. If contemporary educators are to make significant progress in meeting this new challenge, they must first recognize that the institutions in which they work were not designed to accomplish the task of learning for all. They must then acknowledge the need to make fundamental changes in both the practices of their schools and the assumptions that drive those practices." (Richard DuFour, Rebecca DuFour, Eaker, & Karhanek, 2004)

Learner differences are often addressed based on a philosophical orientation, a set of beliefs, or prior experiences with diverse learners. This approach is most often insufficient to know what to teach, how to teach it, and how to know if students acquired the intended learning. It is critical to attend to the connection between instruction, curriculum, and assessment as all students are engaged in the educational process.

Richard DuFour, Rebecca DuFour, and Eaker (2008) identify four fundamental questions that can be used to guide educators to address diverse learning needs including the following:

- Exactly what is it we want all students to learn?
- How will we know if each student is learning all of the essential concepts and skills we have deemed most critical?
- How will we respond when some of our students do not learn?
- How will we enrich and extend the learning for students who are already proficient?

Many schools across the nation are implementing a system level approach that uses a multi-tiered framework to address these questions. One system-level approach with an emerging research base is Response to Intervention (RTI) (National Center on Response to Intervention, n.d.).

The important aspect of a system level approach is that the system is held accountable for the learning of all students whether high performing or low performing. The framework sets expectations, provides opportunities for core, supplemental and intensive instruction and uses multiple levels of assessment data to guide instructional decisions, ensuring that all students are learning. This process is characteristically framed on posing and answering important system level questions. Some examples of important systems questions are:

- What are the expected levels of performance in the essential concepts and skills?
- How are all students doing in relationship to those expected levels of performance?
- Are there important patterns in the results regarding for whom the core is or is not working?
- Is any diagnostic assessment information needed to make instructional decisions?
- What will we do to supplement or enhance within the core for those students who do not meet or who exceed the expectations of core instruction?
- Did the changes to instruction have the intended impact on student performance?
- How will we formatively assess students at the core, supplemental, and intensive instruction levels?

The implementation of a balanced assessment system, which includes universal screening, diagnostic assessment, and formative assessment, is a critical component of response to intervention. The questions posed above are answered by analyzing student assessment data. Periodic universal screening is used to identify the students in need of additional instruction, and ensures that students do not "fall through the cracks." Diagnostic assessment data are used to match needs with appropriate instruction. Formative assessment is used during instruction to determine the effectiveness of the instruction and guide teachers to make changes to instruction when needed (D. Fuchs & L. S. Fuchs, 2001).

Another critical component of effective RTI models is the utilization of a system of scientific, research-based interventions that are increasingly more intensive and directive. The student receives intervention that is more intensive when formative assessment data indicate they are not responding to lower levels of intervention (Buffun, Mattos, & Weber, 2009). These

may be referred to as tiers (Tier 1, Tier 2, and Tier 3) or as core instruction, supplemental instruction, and intensive instruction (Buffun et al., 2009).

Early identification and targeted instruction has clearly been shown to make large differences in student success. In the area of reading, Torgeson (2004) reviewed the results of six early intervention studies that included many of the critical attributes of RTI (use of screening data to identify students at risk of failure, provision of intensive instruction, and effective instructional methods). While the exact effects of the interventions varied, they all were successful in bringing most students (56 percent to 92 percent) to well within the average range of reading ability. In Fuchs et al. (2006), targeted students who received both high quality mathematics core and supplemental instruction (Tier 1 and Tier 2) significantly improved their skills.

In examining the evidence of RTI effectiveness, Gersten et al. (2008) reported strong evidence supporting 20 to 40 minutes of supplemental, intensive, systematic instruction, three-to-five times per week. At the secondary level, there is strong evidence that explicit vocabulary instruction, explicit comprehension instruction, and intensive (individualized) interventions for struggling readers, effects performance in a positive way (Kamil et al., 2008). Kamil et al. (2008) report moderate research evidence for providing opportunities for extended discussion of text meaning and increasing motivation and engagement.

RTI is most commonly adopted to address reading or mathematics difficulty, but can also be applied to promote social behavior (Horner, Sugai, & Todd, 2001). Practices related to addressing behavior problems that have strong research evidence include modifying the classroom environment or schedule, and teaching and reinforcing appropriate skills (Epstein, Atkins, Cullinan, Kutash, & Weaver, 2008). Analyzing the antecedents and consequences of behavior, building a support network of adults and peers, and adopting school-wide behavior supports, have moderate research evidence.

In math, practices with strong effect include: (a) explicit and systematic instruction that provides models of proficient problem solving, think-aloud processing, guided practice, corrective feedback, and frequent cumulative review, and (b) include instruction on word problems (Gersten et al., 2009). Practices with moderate research evidence include: (a) materials that emphasize visual representation, and (b) 10 minutes daily devoted to arithmetic.

RTI practices also have proven effect on English-language learners (Gersten, et al., 2007). The research evidence supports formative assessment using English language measures of phonological processing, letter knowledge, and word and text reading. In addition, there is strong evidence that focused, intensive instruction in small groups, incorporating phonological awareness, phonics, reading fluency, vocabulary, and comprehension, delivered through explicit, direct instruction, impacts reading. Other practices with a strong research base include vocabulary instruction infused into all content areas, instructing on unfamiliar phrases, and cooperative learning tasks for about 90 minutes per week.

According to Heacox (2009), gifted learners have a "unique learning profile that varies significantly from average learners" (p. 136). Gifted learners often require a differentiated advanced tier of instruction because they need both "rigor and complexity in their learning"

(p. 145). As teachers design instruction to meet the needs of gifted learners, it is important that they not only consider the grade level expectations for learning the essential skills and concepts, but also plan for how to go beyond those expectations based on the student's unique learning needs.

How Do We Successfully Teach for Learner Differences?

Even when using a system level approach to addressing learner differences, instructional effectiveness is a critical component to meeting the needs of diverse learners. The effectiveness of instruction is dependent on teachers having instructional skills and tools to address students' needs in a manner that ensures learning. There is a large body of work on effective instruction for all learners, including those with learner differences. (Yesseldyke & Christenson, 2002). Because teachers' time is limited, efficiency in meeting the needs of all learners is essential.

There are effective, research-based instructional methods that teachers need to know, understand and practice to address the needs of diverse learners. In reviews of expert panels, and of the school change research, several strategies with moderate to high effect on learning for students with differences or who are at-risk of school failure or drop-out are identified.

Hall (2002) summarizes research from Kameenui and Carnine (1998) that identifies specific examples of instructional methods and strategies that are applicable to meet the learning needs of all students, including:

Big Ideas: Big ideas function as the keys that unlock content for the range of diverse learners. Those concepts, principles, or heuristics facilitate the most efficient and broadest acquisition of knowledge. Teaching using big ideas is one promising means of striking a reasonable balance between unending objectives and no objectives at all.

Conspicuous Strategies: People accomplished at complex tasks apply strategies to solve problems. Empirical evidence suggests that all students in general, and diverse learners in particular, benefit from having good strategies made conspicuous for them. This, paired with great care taken to ensure that the strategies are well-designed, results in widely transferable knowledge of their application.

Mediated Scaffolding: This temporary support/guidance is provided to students in the form of steps, tasks, materials, and personal support during initial learning that reduces the task complexity by structuring it into manageable chunks to increase successful task completion. The degree of scaffolding changes with the abilities of the learner, the goals of instruction, and the complexities of the task. Gradual and planful removal of the scaffolds occurs as the learner becomes more successful and independent at task completion. Thus, the purpose of scaffolding is to allow all students to become successful in independent activities. There are at least two distinct methods to scaffold instruction: teacher assistance and design of the examples used in teaching.

Strategic Integration: An instructional design component, strategic integration, combines essential information in ways that result in new and more complex knowledge. Characteristics of strategic instruction include: a) curriculum design that offers the learner

an opportunity to successfully integrate several big ideas, b) content learned must be applicable to multiple contexts, and c) potentially confusing concepts and facts should be integrated once mastered. The strategic integration of content in the curriculum can help students learn when to use specific knowledge beyond classroom application.

Judicious Review: Effective review promotes transfer of learning by requiring application of content at different times and in different contexts. Educators cannot assume that once a skill is presented and "in" the learner's repertoire that the skill or knowledge will be maintained. Planned review is essential to ensure that students maintain conceptual and procedural "grasp" of important skills and knowledge (big ideas). Judicious review requires that the teacher select information that is useful and essential. Additionally, review should be distributed, cumulative, and varied. Requirements for review will vary from learner to learner. To ensure sufficient judicious review for all learners, teachers must regularly monitor progress of the students to inform continued instruction and needed review activities. Review that is distributed over time—as opposed to massed in one learning activity/unit—contributes to long-term retention and problem solving.

Primed Background Knowledge: Acquisition of new skills and knowledge depends largely upon a) the knowledge the learner brings to the task, b) the accuracy of that information, and c) the degree to which the learner can access and use that information. Priming background knowledge is designed to cultivate success by addressing the memory and strategy deficits learners may bring to the new task. The functions of priming background knowledge are to increase the likelihood that students will be successful on new tasks by making explicit the critical features, and to motivate learners to access knowledge they have in place.

Flexible Grouping

Flexible grouping is an instructional method that can be used to address diverse student needs and increase motivation. Flexible groups are temporary groups organized by the educator to maximize learning related to a lesson, objective, or whole unit. Groups should be flexible and changing— organized and reorganized to meet the changing needs of the students. Flexible groups take into consideration the dynamics of and advantages inherent in each type of group including both teacher-led and student-led groups. Typically, groups are formed based on students' age, skills, activities, instructional goals, interests and/or knowledge in a subject area. Groups can be put in place for a day, a week, several weeks, or an entire school year if needed. In addition to skills and knowledge, flexible grouping encourages important social skills including problem-solving, cooperation, discussion, and critical thinking skills (Radencich & McKay, 1995).

Universal Design for Learning

Effective instruction requires that teachers have a way to design instruction that will support the learning needs of all students. Universal Design for Learning (UDL) is a framework that guides teachers in the development of flexible lesson plans that ensure that all students have equal opportunities to learn. "Universal Design for Learning (UDL) is a research-based framework for designing curricula—that is, educational goals, methods, materials, and

assessments—that enable all individuals to gain knowledge, skills, and enthusiasm for learning. This is accomplished by simultaneously providing rich supports for learning and reducing barriers to the curriculum, while maintaining high achievement standards for all students" (CAST, 1999–2010).

The concept of universal design first emerged in the world of architecture (Center for Universal Design, 1997), when building designers determined prior to construction, how structures would be accessible for all people, including those with physical disabilities. Design features like ramps rather than stairs, elevators, push button door entry, automatic door entry, cut out street curbs, and lever door handles, represent a universal design approach. By incorporating these features, building designers created structures that eliminated access barriers for people using wheelchairs or walkers.

UDL includes a set of principles for curriculum development that provides a map for creating and designing instructional goals, methods, materials, and assessments that can be customized and adjusted for individual needs. The three principles of UDL include:

- **Provide Multiple Means of Representation**: The teacher provides multiple, flexible methods of instructional presentation so that students can interact with the content in ways that are aligned to their individual learning preferences.
- **Provide Multiple Means of Action and Expression**: The teacher provides multiple options for students to demonstrate what they have learned.
- **Provide Multiple Means of Engagement**: The teacher uses multiple instructional approaches designed to enhance student engagement and motivation to learn. Instruction is designed based on the student's particular learning strengths and weaknesses while maintaining learning expectations.

Maximizing Instructional Time

Research consistently shows that the more time students spend involved in learning activities, the more they learn. There is a strong positive relationship between the amount of time students are actively engaged in learning activities and their achievement. It is also true that increased time spent in academic learning does not result in negative attitudes toward school or learning. (Ellis & Worthington, 1994; Coyne, Kame'enui, & Carnine, 2007; Marzano, Pickering; & Pollock, 2001).

Most teachers schedule and allocate the appropriate amount of time for learning, but it is equally critical for teachers to ensure that students are engaged actively in appropriate tasks that students can perform with a high rate of success. Low success rates correlate negatively with student learning outcomes.

Through research on how children learn, we know that children learn when material is engaging, related to things they know about, and presented at a pace that keeps them engaged. We also know that children master content when they are more correct in their responses than incorrect. Generally, children are thought to be in the appropriate zone for learning when they can answer questions or respond correctly at least 8 out of 10 opportunities. Therefore, teachers need to design lessons to minimize incorrect guessing,

and incorporate immediate feedback to children about when they are correct and immediate error correction when children are not correct.

For many students with learning challenges it is so important that they are not given the opportunity to make mistakes when learning a new skill. Errorless learning refers to teaching procedures that are designed in such a way that the learner does not have to— and does not—make mistakes as he or she learns new information or new procedures. Errorless learning may be more effective for students who frequently make mistakes, who lack confidence, and/or who do not remember their learning experiences and the feedback that they receive.

Practices with moderate to strong research support include: (a) review key elements several weeks to months after initial exposure and mastery (moderate), (b) structure materials to have alternating formats of already worked solutions and students solving problems on their own (moderate), (c) combining graphs and figures with text (moderate), (d) use concrete representation to link abstract concepts (moderate), (e) using quizzes to re-expose students to key content (strong), and (f) asking questions to promote deeper understanding (strong) (Pashler et al., 2007).

Instructional conferencing is another strategy encouraged in inclusive settings. This strategy relies on teachers working individually with students in the classroom and assisting them with assignments and personal development (Learned, Dowd, & Jenkins, 2009). This method works well in classrooms that incorporate a co-teaching model or team teaching. With this model, teachers conference with students individually and differentiate their instruction with the goal of assessing student understanding of the material. Teachers can also take this opportunity to organize their work, break down assignments, re-teach the content, or provide encouragement and motivation.

Teaching Academic Survival Skills

As was summarized in the introduction, learner differences exist because children bring different background experiences to schools. In order for instruction to be effective, it must include strategies that support activation of knowledge and opportunities for students to make connections between previously learned and about to be learned information. Educators can strengthen those connections through the use of specific techniques and strategies that allow students to organize, store and retrieve relevant information. Effective strategies help students attend to tasks, focus on relevant task features, rehearse information (positive and negative examples, elaborate on information, monitor levels of understanding), check for understanding, take corrective actions, cue learners to retrieve information, and maintain a favorable climate conducive to learning—avoiding high stress levels and a low success rate.

Strategic instruction is designed to teach students how to apply techniques, principles, or rules in order to solve problems and complete tasks successfully and independently. When students have a "plan" to solve problems or approach tasks, they will become more independent, self-regulated learners. Good strategic instruction results in students being able to personalize and adapt strategies and know when, where and how to use them.

Cognitive strategies are the tools, and metacognitive strategies encourage students to reflect and evaluate their use of the strategy.

According to Coyne et al. (2007), teaching students how to learn involves explicit modeling of how to build a variety of strategies that students can use as a resource. They identify the following as an approach to explicitly teach students "how to learn:"

- Understand that different learning tasks require different learning strategies
- Teach the strategy and the conditions under which the strategy can be used
- Model the strategy and work towards independence
- Encourage the student to reflect upon the usefulness/success of a strategy
- Incorporate the strategy into their repertoire or "toolkit" for future learning tasks

An emerging body of research is proving that pre-teaching new vocabulary and "academic language," helps students in particular from poor and language-learning backgrounds, access content that students from more language-rich or academic-rich backgrounds, bring to school (Reese, Thompson, & Goldenberg, 2008).

Marzano and Pickering (2005) identified key vocabulary that they believe—if explicitly taught to children—will reduce the achievement gap. While not proven through extensive research, Marzano and Pickering use the research to promote a strategy with some degree of effect. The idea is that by teaching students complicated words that they do not hear at home, teachers give students access to knowledge that students otherwise would not have.

New vocabulary words are pre-taught (tell students how to read and pronounce the words and what the words mean), before the students start to read text, hear content, and complete assignments on the topic. Teachers also build in use of the key words—using multiple choice, written response, or application of words in essays or verbal response— so that children get many opportunities to use the words properly.

Progress Monitoring

Teachers make on-demand decisions about student mastery on a daily basis, through formal and informal means. For most high achieving students, these checks are sufficient to promote high levels of learning, as long as the teacher uses the information to determine what content needs to be presented in other formats or needs more time, or what types of extension are necessary to assure learning targets are met.

For struggling students, progress monitoring is a proven practice at the elementary level to support teachers in making decisions about necessary instructional changes. Progress monitoring involves more structured, scheduled administration of brief skills probes that result in a score. Teachers plot the scores on a graph and examine the performance against the desired level of performance. When performance falls below the goal over a course of several weeks, the teacher increases the time of instruction, or the pace of responding, or examines other means for presenting material or assessing response (as in UDL).

Progress monitoring is different than on-demand assessment or rubrics because a structured probe is administered. Research in human learning has proven that expert

learners are much more automatic in their responses than novice learners. This is why it is important to maintain the same skills in each probe, the same response format in each probe, and the same administration time. Being able to more sensitively measure performance is the reason why curriculum-based measures (Shinn, 1989) use atypical scoring methods. Social performance in general is difficult to measure, and either direct observations or rating scales, can be acceptable measures for use in progress monitoring (Walker & Sprague, 1999).

Research on progress monitoring has demonstrated very powerful learning outcomes when teachers use the information to make instructional changes (Fuchs & Fuchs, 1986). It is important to note that "instructional change" does not mean "more of the same." Maximizing instructional time, as described above, involves deciding if lessons need to be changed. There are various ways to change instruction including more structure, more practice, change in pace of instructional presentation, adaptation of materials (mixing tasks already mastered with those being taught so that the child remains more accurate in their responses than not), different presentation formats (like stories or internet information using read-aloud technology), or different response formats (verbal retell). Being attentive to appropriate instructional changes will allow for instructional efficiency and will provide children with the learning experiences, practice, and feedback, that they need to master content.

Conclusion

Teaching for learner differences includes a broad continuum of characteristics. By definition, all students have differences regardless of the various subgroups that have been identified. So, why teach for learner difference? The education system in the United States of America is unique in the fact that **all** students are valued and deserving of equal academic opportunities. Therefore, educators are responsible for identifying academic and behavior needs for each student. The goal is that every student has opportunities for success while in school, but more importantly, for life beyond school—whether that includes higher education or not. How is ensuring the success of each and every student accomplished? This can be accomplished through a systemic approach that carefully identifies, monitors, and targets student needs. Finally, how do educators determine the best methods of instruction that will address learner differences? Through practice, collaborative inquiry of research, and through the support that educators can provide each other, teaching for learner differences will be the standard mode of operation in all schools across America.

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