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Facilitating Greater Instructional Differentiation Via Research-based Teacher Reflections and Site-Based Procedural Guidelines.

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Abstract: *This article is designed to facilitate guided teacher reflections about teaching-learning practices so that more educators recognize and appreciate that they already employ many constructivist strategies, techniques, and activities on a frequent basis. And, that the most appropriate consultants to help them become even more constructivist teachers may be their colleagues who work daily in the classrooms at the same school site.*

Keywords: *Student-centered Approaches, Constructivism, Differentiation, Discrepancy Study*

Introduction

Although there are numerous student-centered educators practicing constructivist approaches and employing differentiation strategies, techniques, and activities in various contemporary teaching-learning settings throughout the United States, many of them have not reflected in a focused manner about those practices as being consistent with differentiation and constructivism nor have they reflected about their frequency of use of those activities and techniques. The authors contend that there are literally thousands of excellent teachers in this country whose beliefs and practices align with constructivist philosophy and who work diligently to customize their instruction to meet the needs and interests of their students. But, there are external factors that restrict or significantly impede their applications of the best teaching-learning practices for their students. There are national and state standards and accountability issues as well as school district assessment and evaluation expectations and procedures that detract teachers from being as student-centered in their teaching-learning settings as they would prefer. Those issues and others have a tendency to pull teachers to a teacher-centered focus in lesson preparation, unit assessments, and student achievement evaluations.

The purpose of this article is to provide a pragmatic procedure that enhances teacher reflections about their current state as well as their desired level of various instructional practices associated with student-centered differentiation instruction. The authors firmly believe that teachers are professionals who need guided reflection time and specific concrete examples to further develop as effective teachers in their contemporary contexts. Most of them have the knowledge, skills, and dispositions to differentiate more of their instructional practices but either

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lack the time, professional support, or concrete evidence to do more of it. This article provides teachers leaders with the specific tools and procedures to help themselves and others become even more constructivist in their teaching and customize more of their learning activities for their students. An important aspect of this approach is that the "consultants" who are able to facilitate even more differentiation at school sites around America already reside and teach at those sites. Thus, this approach uses the expertise and the experiences of the professional learning community members at the school site to promote more effective instruction to meet the needs and interests of the students at that site. It is a teacher "user-friendly" approach that does not require additional expenditures for references, materials, or consultants. All that is required is the collaboration and honest assessment of teaching at the site and the sharing of "best practices" that have been used at that site by members of the professional learning community.

The specific objectives of the authors of this article are to: a) promote the success of all students at all levels of the instructional spectrum via purposeful teacher reflections; b) present findings of six different research studies conducted in the following four states: Georgia (2007 & 2010), New York (2009 & 2010), Texas (2010), and Virginia (2010); c) encourage other educators to apply this research-based reflective discrepancy model in their work with pre-service and in-service educators at site-based sessions to improve instruction and to facilitate more of a transition from teacher-centered instruction to student-centered learning in contemporary America.

Conceptual Background

Teachers, at all levels of the educational spectrum, have been encouraged to consider using appropriate models of instruction to meet the different needs of their respective students (Johnson, Collins, Duperes & Johansen, 1991; Tomlinson, 2009). The authors of this article focus on the premise that most educators today are attracted to two diametrically opposed magnetic-like poles related to the teaching-learning process: at one pole is the learner-centered approach to teaching and learning and the opposite pole is the teacher-centered approach. Figure 1, originally developed by Polka (2007) illustrates these opposable magnet pulls on contemporary educators trying to make a difference for their respective students. It also identifies that most teaching practice occurs somewhere between both of those poles and/or vacillates between those magnet poles based on the following nine behaviors associated with the teaching-learning process as initially articulated by Heathers (1968): 1) teacher objectives; 2) teacher planning and preparation; 3) teacher communication and messages; 4) teacher behaviors; 5) student objectives; 6) student planning and preparation; 7) classroom expectations of students; 8) student communication and messages; and 9) student evaluations.

The significance of these nine teaching-learning behaviors and their corresponding classroom manifestations have been comprehensively reinforced by the following educational researchers: Armstrong, Henson & Savage, 2005; Brooks & Brooks, 1993; Danielson, 2002; Darling-Hammond, 1997; Eggen & Kauchak, 2001; Foote, Vermette & Battaglia, 2001; Marzano, Pickering & Pollock, 2001; Ornstein & Levine, 2008; Slavin, 2006; Sternberg & Williams, 2002; Tomlinson, 2009; Tomlinson, 2014; Tomlinson, Brimijoin & Narvaez 2008; Tomlinson & Imbeau, 2011.

The researchers associated with this paper contend that using Figure 1 to encourage practicing educators to reflect about their respective desired teaching-learning behaviors compared to their actual teaching-learning behaviors is a key starting point to help them realize their current use of constructivist approaches and their desired level of use. An analysis of the

discrepancy between desired practices and actual practices of various constructivist activities, strategies, and techniques provides an opportunity for each participating professional to reflect about those constructivist practices that are most congruent with their current practices as well as those practices that are most non-congruent and, subsequently, most difficult to implement without significant professional development and reinforcement.

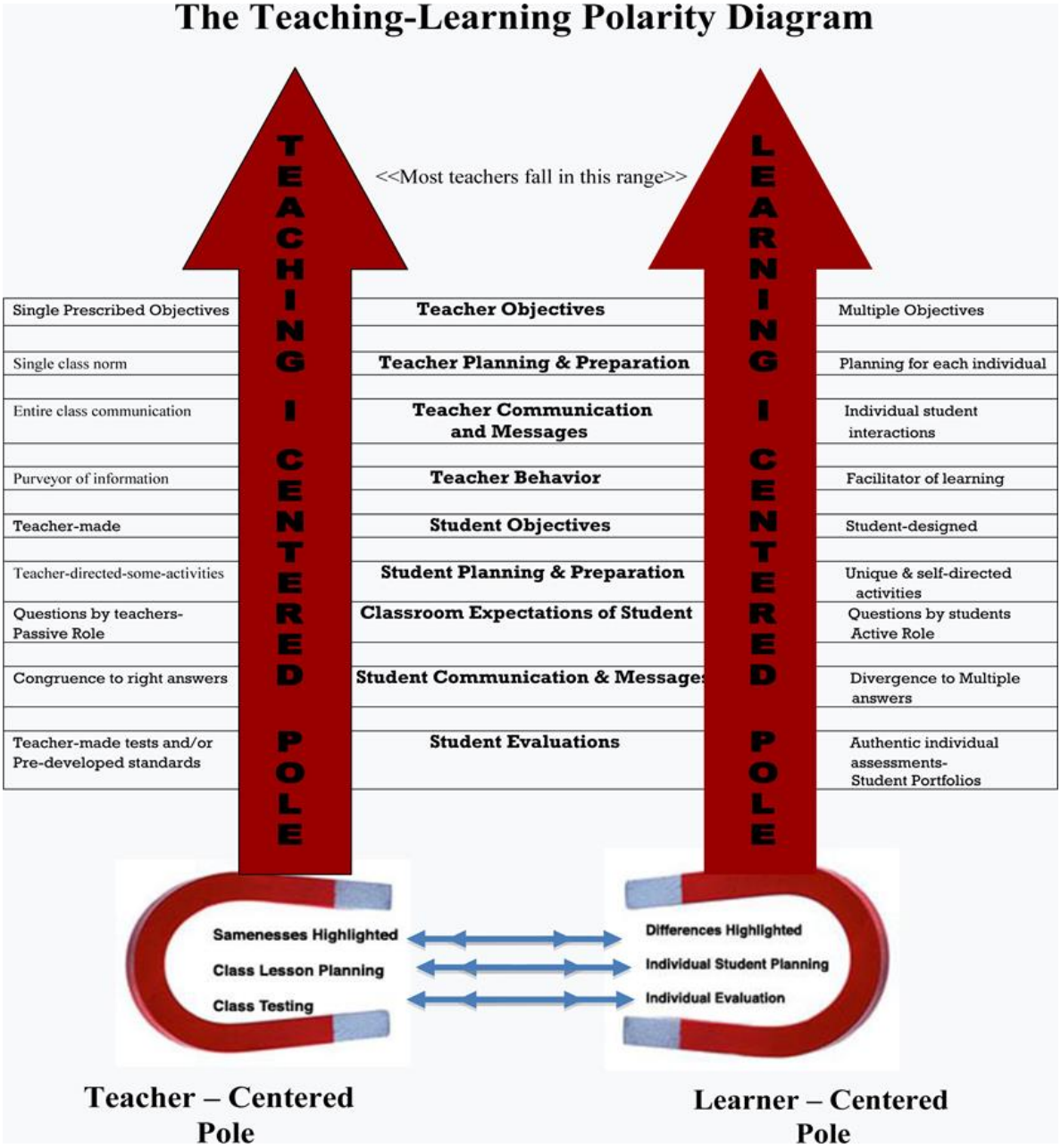

Figure 1. Polka, 2002

Survey Instrument

In 2007 a team of researchers at Georgia Southern University developed a quantitative survey instrument to determine the "desired" frequency of use of various instructional activities, techniques, and strategies associated with those constructivists approaches identified on the Learner-Centered Pole in Figure 1 as well as the "actual" use of those approaches in Georgia classrooms similar to other discrepancy survey models (Polka & VanHusen, 2014, Polka, 2010, Denig, 1994). The resultant survey instrument: *Desired and Current Use of Constructivist Activities and Techniques* consists of the following three parts:

- Part I. Demographic data – provides information about participants' educational experiences.
- Part II. Frequency of Instructional Use and Desired State – collects information about participants' desired frequency of use and their respective actual frequency of use of the various learner-centered approaches as identified in Figure 1.
- Part III. Personal Responses – provides participants with the opportunity to respond to the following open-ended questions: 1. What do you feel needs to be done to make individualized instruction and customized learning or differentiation practices more common in today's classrooms? 2. Please provide any additional comments you may wish regarding individualizing instruction and customizing learning in contemporary contexts.

The construct validity of the Part II survey instrument statements is reflected in Table 1. Each of the 25 statements includes both a "desired" and a "actual" component. All of the statements are derived from the research and literature associated with constructivism, differentiation, individualized instruction and customized learning of the past 75 years. Therefore, survey participants were asked to respond to a total of 50 statements (25 "desired" teaching-learning behaviors and 25 "actual" teaching-learning experiences) that were also correlated to nine well-documented teaching-learning behaviors initially articulated by Heathers (1967) to further amplify their relationship to the above Figure 1.

Table 1. Construct Validity of Survey Statements

Instructional Behaviors	Related Survey Statements/References
Teacher Objectives	2. *Classroom objectives focus on cultivating and facilitating social skills, cooperation, idea exchange, and shared problem-solving, as opposed to memorizing.* Armstrong, D., Henson, K. & Savage, T. (2005); Blasé, J. and Kirby, P. (2000); Marzano, R.; Pickering, D. & Pollock, J. (2001); Picciano, A. G. (2009); Polka, W. (2002); Tomlinson, C. (2001).
Teacher Planning & Preparation	*5. Different students, when working on a unit of instruction, use different materials, resources and equipment.* *10. Knowledge of each student including life outside of school is used to plan instructional activities.* *12. The time that students have to complete or master a given concept or skill varies based on individual differences.* *17. Diagnostic elements, such as I.Q., reading level and math ability are used to plan individual student activities.* *18. Lesson planning is done for individual students rather than for the entire class.* *21. Different instructional techniques are used with different students.* *23. A variety of diverse learning assignments are designed to meet individual student interests and needs.* *25. The teacher varies the type and degree of difficulty of their questions to assure that each student understands.*

	Beane, J., Toepfer, C., Alessi, S. (1986); Dufour, R. (2004); Ernest, J. M., Heckaman, K. A., Thompson, S. E., Hull, K. M., & Carter, S. W. (2011); Woolfolk, A. (2001);Youb, K. (2010).
Teacher Communication and Messages	*14. The personal problems or learning handicaps of students are accepted with consideration, understanding and empathy.* *20. The teacher communicates individually with students or in small groups, as opposed to "total" class discussions.* Eggen, P. & Kauchak, D. (2001); Foote, C., Vermette, P., & Battaglia, C. (2001); Harnack, R. (1968); Mazer, J. P., McKenna-Buchanan, T. P., Quinlan, M. M., & Titsworth, S. (2014); Voltz, D., Sims, M., & Nelson, B. (2010); Zarraonandia, T., Aedo, I., Diaz, P., & Montero, A. (2013).
Teacher Behaviors	*8. The teacher's role is that of facilitator of learning or resource partner, "guide on the side".* *11. The students and teacher respect the diverse opinions of others and come to agreement in a collegial fashion.* Darling-Hammond, L. (1997); Foote, C., Vermette, P., & Battaglia, C. (2001); Gillies, R. M. (2011); Marzano, R. (2003); Tomlinson, C. (2004); Werderich, D. E. (2010).
Student Objectives	*19. Pretests and other similar diagnostic instruments are used to determine the parts of a unit that individual students need.* Marzano, R. (2003); Polka, W. (2002); Tomlinson, C. (2014); Slavin, R. (2006); Newmann, J. W. (2013); Snowman, J. & Biehler, R. (2003).
Student Planning & Preparation	*22. Students play an active role of contributing to the direction or content of the lesson in their learning experiences.* *24. Students are offered instructional assistance and guidance individually rather than in a large group.* Dewey, J, (1996); Hodges, T. S., & Mc Tigue, E. M. (2014); Marzano, R. (2003); Polka, W. (2002); Tomlinson, C. (2009); Slavin, R. (2006).
Classroom Expectations of Students	*3. Cooperative learning experiences are used so that students often receive instructional assistance from one another.* *7. Students conduct a major part of their learning on a self-directed basis.* Danielson, C. (1996); Eggen, P. & Kauchak, D. (2001); Celikten, O., Ipekcioglu, S., Ertepinar, H., & Geban, O. (2012); Tsay, M., & Brady, M. (2010); Tomlinson, C. (2009); Voltz, D., Sims, M., & Nelson, B. (2010).
Student Communication and Messages	*1. The teacher practices the use of open-ended questioning rather than focusing on the "right" answer syndrome.* *4. Sufficient time is allocated for students to think, play with ideas, manipulate objects, and experiment in learning, without pressure to get "the right answer: at the "right time."* *15. Information is presented in a manner that promotes authentic inquiry and students are encouraged to consider questions for which a "right" answer may not exist.* Harnack, R. (1968); Lohfink, G. (2013); Marzano, R. (2003); Polka, W. (2002). Tomlinson, C., Brimijoin, K., & Narvaez, L. (2008); Snowman, J. & Biehler, R. (2003).
Student Evaluation	*6. Students are evaluated individually and move on to another task once they have mastered the objectives of a unit.* *9. Student evaluations are based on the individual learning growth instead of fixed standards all are expected to learn.* *13. Divergent ideas are encouraged by the teacher in evaluating student work, as opposed to expecting convergence in exams and other evaluations.* *16. Formal evaluations and marking are based on authentic assessment principles.* Doll, R. (1972); Koh, K. H., Tan, C., & Ng, P. T. (2012); Ornstein, A. & Levine, D. (2008); Sternberg, R. & Williams, W. (2002); Tomlinson, C. (2001); Dennis, L. R., Rueter, J. A., & Simpson, C. G. (2013).

The researchers applied the Cronbach Alpha reliability test (Coladarci, Cobb, Minium, & Clarke, 2008) to survey instrument data collected from over 500 practicing teachers and the results were as follows: Questions 1-25 (Desired) R=.942; Questions 1-25 (Actual) R=.922. These results indicate a very high reliability for both the desired and the actual frequency of use statements associated with instructional activities, techniques, and strategies related to student-centered instruction. Thus, the instrument statements gleaned from the existing research and literature on the topic are valid and reliable to assess participant desired frequency of use and actual frequency of use of teaching-learning activities, techniques, and techniques associated with constructivism, differentiation, individualized instruction, and customized learning. Collecting this data from practicing teachers provides the participants with a valid and reliable "snapshot" of their current placements on Figure 1: The Teaching-Learning Polarity Diagram.

Quantitative Research Design

A convenience survey sampling technique (Coladarci, Cobb, Minium, & Clarke, 2008, p. 202) was used to distribute and anonymously collect both the paper surveys and online surveys from educators known to have employed various differentiation strategies in their respective classrooms in both Georgia (2007) and New York (2009 and 2010). Initially, those two states were selected because they represent two states at generally opposite ends of the political, economic, social, and educational spectrums in the United States according to a variety of key indicators (Polka & Litchka, 2008). Subsequently, most other states' educational experiences with public education and constructivist approaches and practices may be placed on a continuum somewhere between Georgia and New York. In addition, research team members were familiar with numerous educators in both states.

A total of 940 survey instruments were distributed or available "on-line" to practicing teachers in both states. Subsequently, A total of 582 useable surveys were returned for analysis. This number represented a return rate of 61.9% of those educational populations surveyed.

As a result of analyzing the aggregated data collected from these 582 practicing teachers specific benchmarks were developed and categorized into four quadrants that were later used in site-based qualitative case studies with practicing teachers in Georgia, New York, Texas, and Virginia (Polka, 2010; Polka, et al., 2011; Polka & VanHusen, 2014). These resultant research-based benchmarks serve as excellent references for educators as they continue to move to a more student-centered approach to teaching and learning. The following tables 2-5 illustrate each of the four quartiles associated with this research-based guide.

The seven survey statements identified in Table 2 represent those constructivist approaches and differentiation strategies, techniques, and activities that have the greatest congruency between desired and actual practices of sample teachers who completed the survey instrument. There is high probability that some, if not most, teachers at any school site already employ, to some degree, these various differentiation strategies, techniques, and techniques in their instructional programs. All teachers in a site-based context should collaboratively reflect about their specific practices in this quadrant and interact with each other and "pull" each other even more toward the "Student-Centered Learning Pole".

The seven survey statements identified in Table 3 represent those constructivist approaches and differentiation strategies, techniques, and activities that have a high degree of congruency between desired and actual practices of sample teachers who completed the survey instrument. There is good probability that some, if not a majority, of teachers at any school site already employ these various differentiation strategies, techniques, and techniques in their

Table 2. Quartile 1. Survey Statements with Greatest Degree of Congruency

Survey Number	Survey Statement	Degree of Difference Between Means of "Desired" and "Actual" Pr
14	The personal problems or learning exceptionalities of students are accepted with consideration, understanding, and empathy.	0.46
20	The teacher communicates individually with students or in small groups, as opposed to "total" class discussion.	0.52
3	Cooperative learning experiences are used so that students often receive instructional assistance from one another.	0.56
1	The teacher practices the use of open-ended questioning rather than focusing on the "right" answer syndrome.	0.57
24	Students are offered instructional assistance and guidance individually rather than in a large group setting.	0.65
25	The teacher varies the type and degree of difficulty of questions to assure that each student understands.	0.65
16	Formal evaluation and marking are based on authentic assessment principles.	0.66

instructional programs. Teachers in this context should collaboratively reflect about specific successful practices associated with the statements of this quadrant and some should serve as mentors to support others in experimenting with various strategies, techniques, and activities associated with this quadrant to "pull" more Learning Community Members toward the "Student-Centered Learning Pole".

The six survey statements identified in Table 4 represent those constructivist approaches and differentiation strategies, techniques, and activities that have a moderate degree of congruency between desired and actual practices of sample teachers who completed the survey instrument. There is good probability that some teachers at any school site already employ, to a moderate degree, some of the various differentiation strategies, techniques, and techniques associated with this quadrant in their instructional programs. Teachers in this context who feel comfortable using these practices should collaboratively reflect about the identified practices associated with these statements and a few of them who have the most experience with these practices could be highlighted and encouraged to serve as models for others to "attract" more Learning Community Members toward the "Student-Centered Learning Pole".

The five survey statements identified in Table 5 represent those constructivist approaches and differentiation strategies, techniques, and activities that have the lowest degree of congruency between desired and actual practices of sample teachers who completed the survey instrument.

Table 3. Quartile 2. Survey Statements with High Degree of Congruency

Survey Number	Survey Statement	Degree of Difference Between Means of "Desired" and "Actual" Practices
2	Classroom objectives focus on cultivating and facilitating social skills, cooperation, idea exchange and shared problem-solving, as opposed to memorizing.	0.70
21	Different instructional techniques are used with different students.	0.78
8	The teacher's role is that of a facilitator of learning or resource "guide on the side".	0.82
15	Information is presented in a manner that promotes authentic inquiry and students are encouraged to consider questions for which a "right" answer may not exist.	0.82
5	Different students, when working on a unit of instruction, use different materials, resources and equipment.	0.83
13	Divergent ideas are encouraged by the teacher in evaluating student work, as opposed to expecting convergence in exams and other evaluations.	0.83
23	A variety of diverse learning assignments are designed to meet individual student interests and needs.	0.83

Table 4. Quartile 3. Survey Statements with Moderate Degree of Congruency

Survey Number	Survey Statement	Degree of Difference Between Means of "Desired" and "Actual" Practices
17	Diagnostic elements, such as I.Q., reading level and math ability are used to plan individual student activities.	0.85
10	Knowledge of each student including life outside of school is used to plan instructional activities.	0.88
11	The students and teacher respect the diverse opinions of others and come to agreements in a collegial fashion.	0.89
19	Pretests and other similar diagnostic instruments are used to determine the parts of a unit that individual students need.	0.90
7	Students conduct a major part of their learning on a self-directed basis.	0.94
18	Lesson planning is done for individual students rather than for the entire class	0.94

There is good probability that some, if not a majority, of the teachers at any school site are not very familiar with employing these various differentiation strategies, techniques, and techniques in their instructional programs. Teachers in this context should collaboratively reflect about the value of the practices associated with the statements of this quadrant and a few could serve as models to provide concrete evidence that the statements can be realized in contemporary teaching-learning situations so as to illustrate the professional "attractiveness" of the "Student-Center Learning Pole".

Table 5. Quartile 4. Survey Statements with the Least Degree of Congruency

Survey Number	Survey Statement	Degree of Difference Between Means of "Desired" and "A Practices
4	Sufficient time is allocated for students to think, play with ideas, manipulate objects, and experiment in learning without pressure to get "the right answer" at the "right time."	0.97
12	The time that students have to complete or master a given concept or skill varies based on individual differences.	1.00
9	Student evaluations are based on individual learning growth instead of a fixed standard all are expected to learn.	1.06
6	Students are evaluated individually and move on to another task once they have mastered the objectives on a unit.	1.12
22	Students play an active role of contributing to the direction or content of the lessons in their learning experiences.	1.16

Recommended Site-based Procedures to Promote Greater Differentiation of Instruction

This research team concludes that employing this reflective approach based on the above identified above quartiles is the most effective and teacher "user-friendly" manner to promote more differentiation of instruction at any level of the instructional spectrum. Accordingly, educational leaders should consider using the following as a recommended guide to promoting greater differentiation of instruction at any specific educational school or learning site:

1. Introduce the key elements of the student-centered or differentiated approach to the local educators using Figure 1 to emphasize the differences between the student-centered approach and the teacher-centered approach.

2. Next, teachers should be given time to reflect about where they would like their current practices to be located on the continuum between the two instructional poles displayed in Figure 1 and where they think they currently are located according to their behaviors on the nine teaching –learning components as identified in Figure1.

3. Then, The *Desired and Current Use of Constructivist Activities and Techniques Survey* instrument should be given to participants who should be encouraged to specifically identify their desired frequency of use as well as their current frequency of use of the 25 statements

associated with individualization of instruction and customization of learning in their respective classrooms.

4. The survey instrument data from this site-based professional learning community should then be analyzed in light of the current national benchmarks associated with the survey instrument as identified in this article to illustrate how similar the site-based sample is to the general teacher population reflected in those benchmarks.

5. Then, starting with quadrant 1 and progressing slowly through the other quadrants, educational leaders should have practicing teachers at the school site share their experiences with the various instructional components of each quadrant.

6. Numerous examples should be specifically highlighted to illustrate that student-centered approaches, as identified in each quadrant, are not so radically different from current practices used in this school.

7. Finally, it is imperative that these instructional reflections and site-based teaching examples are catalogued for future reference to evidence growth over time toward differentiation of instruction over time in this specific school setting.

Consequently, encouraging colleagues to discuss their current differentiation techniques and strategies with each other in a structured approach as well as encouraging them to reflect about their desired levels of use of those practices in a safe familiar setting is a key factor to increase awareness and further the appreciation of the student-centered learning approaches currently employed at this school level. Thus, this progressive approach, starting with the quartile of greatest congruence between desired states and current realities (quadrant 1) and progressing through the other quadrants, provides evidence that there are several specific examples of teachers using the identified desired constructivist activities, techniques, and strategies in this school as well as elsewhere. And, that, collaboratively, the teachers at this specific school site are the best providers of instructional professional growth opportunities for each other. Subsequently, greater instructional differentiation should occur in more classrooms across America because of using this research-based reflective approach and the above procedural guidelines with less teacher stress and more teacher understanding and enthusiasm than has been the case in the past.

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