The Curry/Samara Model®: Curriculum, Instruction, and Technology Yield Statistically Significant Results

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Abstract: The Curry/Samara Model (CSM) is yielding statistically significant results in terms of improving student performance on standardized tests, especially noticeable in low socio-economic environments. Factors involved in increasing student success rates include: (1) the design and implementation of curriculum units based on state standards; (2) the design and implementation of rubrics aligned to curriculum units and state standards; (3) the implementation of brief, monthly study groups which focus on embedding lessons with strategies that foster engaged learning; and (4) the technological support of UnitWriter software, StandardWriter software and digital vignettes of the teaching/learning process. According to multiple, research studies, the implementation and continued use of the Curry/Samara Model significantly raises student achievement.

The Design and Implementation of CSM Curriculum Units

The hallmark of the Curry/Samara Model® is the CSM Unit Matrix (Figure 1). The CSM Unit Matrix is a graphic tool for designing integrated, standards based curriculum units. The Matrix addresses curriculum in a way that begins with a teacher's state standards and results in a three to six week unit of study that fosters differentiated instruction in regular classrooms, as well as in special education and gifted education environments.

The Unit Matrix includes a content outline that appears in the left-hand column. The subject matter that is depicted in the content outline is derived from state standards, as well as other material which the teacher deems essential to student understanding and success. McGehee (2001) supported the belief that teachers must have a well-developed curricular knowledge of the big ideas in a content area. The content outline is used to organize the teacher's subject matter from the top several topics, which consist of factual content, to the bottom several topics, which address more global concepts. The title defines the concept or theme that drives the entire unit, and it is the section of the Matrix that is developed first. Concept-driven unit development helps students learn how to learn (Ornstein, 1997), and the CSM Unit Matrix provides teachers with a format for this important work.

Beyond the content outline, the CSM Unit Matrix consists of many student activities that reside in the numbered cells. Following any one row across from left to right, the content at the left end of the row drives the student activities in each cell of that row. The concepts that are listed in that section of the content outline are what define the topics that appear in the middle section of each cell entry. Each row of the Matrix can be considered a mini-unit, as it is organized to teach the content that reside at the left end of the row.

The content that appears in each cell is "sandwiched" between two other curricular elements: the cognitive verb and the student product. The "formula" for a well-written cell entry is as follows: a cognitive verb that fosters thinking at the level depicted by the header at the top of it's column + content from the section of the outline appearing at the left-hand side of that row + a student product that supports learning of the content at that level of thinking. Each cell

can also contain a state standard, allowing curriculum writers to cross-reference their lessons to state mandated curriculum. Therein, each cell contains a "snapshot" of a lesson, stated in terms of expected student outcomes. This learning objective stipulates: (1) the desired level of thinking (from basic to abstract) for the lesson; (2) the content or subject matter (from factual to global) with which student will engage; and (3) the student product (from traditional to innovative) that students will complete in order to construct meaning and demonstrate proficiency. The Matrix provides a global view of the entire unit of study, showing all of the content and all of the student learning objectives. A more detailed depiction of implementation comes about in the lesson plans, and there can be a detailed lesson plan (Figure 2) for any of the cells in the Matrix.

Figure 1: The Curry/Samara Model Unit Matrix

Figure 2: Curry/Samara Model Lesson Plan

Lesson plans are created for the learning objectives found within the Matrix cells. The focus of the CSM Lesson Plan is to plan and describe the actions that the teacher will take to bring about the learning specified in the learning objective. The most noteworthy section of the lesson plan is the section entitled Instructional Strategies. It is in this section that the teacher stipulates the actions that will be taken as related to six categories of instructional strategies: content, thinking, product, assessment, facilitation, and reflection. While the Matrix format prompts teachers to create a comprehensive unit of study, the lesson plan focuses on implementation of a single cell in the Matrix. The six categories of instructional strategies will be addressed below, as related to the Model Classrooms Project.

Technology Implications: UnitWriter® software takes a curriculum writing process and format that has been used by thousands of teachers for nearly two decades, and refines it. UnitWriter makes the process easier and "locks" teachers into formats that help them write well. In the past, educators have used scores of sticky notes to brainstorm and organize the topics for their content outlines. UnitWriter fosters brainstorming and organizing through a "drag and drop" approach to outline construction. In the past, curriculum writers designed student objectives for individual Matrix cells by paging through scores of handouts for verb lists, product lists, and lists of state standards. UnitWriter has built into it suggested thinking verbs at six levels (knowledge, comprehension, application, analysis, creative thinking and critical thinking), lists of products within four modalities (written, visual, kinesthetic, and oral), and state standards from six states (GA, KY, IL, MI, OH & TX). There is also a UnitWriter Internet Module for displaying online finished units of study. A sample posting of units may be accessed at <www.iagcgifted.org>.

The Design and Implementation of CSM Product Guides and Rubrics

A vital aspect of the Curry/Samara Model involves an emphasis on students putting forth more effort during class time. In reviewing a month's worth of classroom activities, the amount of time that a teacher has spent teaching should (at least) be equaled by the amount of time that students spend applying concepts through various products. Products are vehicles (essays, diagrams, flip books, oral reports, models, etc.) through which students construct meaning. Without ample student production time, the teaching/ learning process is a static, passive scenario in which students take in information. Products allow for the manipulation of subject matter, creating opportunities for students to relate concepts to that which is already familiar. Products are also vehicles for students to demonstrate understanding and they provide the student and teacher with a tool for assessing what was learned and what might need to be re-taught. As teachers and administrators continue to examine teaching and learning processes,

assessment is an integral link in programs where students make progress toward expected standards (Day & Skidmore, 1996). By categorizing products into written, visual, kinesthetic, and oral modalities, the teacher becomes cognizant of the various approaches to learning that might engage one student while not another.

Figure 3: StandardWriter Software Product Possibilities Screen

Technology Implications: If students are to successfully demonstrate understanding of subject matter through small daily products and through longer term projects, they require clear standards for their work. StandardWriter® is a software tool that allows teachers to select (double-click on) products from categorized lists (Figure 3) and bring up a blank rubric template for that product. With the blank rubric template in view, the user selects parts and attributes from lists of performance standards and enters them into the blank rubric template to begin constructing a custom rubric (Figure 4). Once the rubric is complete, the teacher may print and distribute copies to students so that they have a written guide to reference as they work.

Figure 4: Rubric in progress

Rubric construction and implementation complements the implementation of the CSM Matrix. As discussed, in each cell of the CSM Matrix resides a learning objective that begins with a cognitive verb, followed by subject matter, and ending with a student product. The more sophisticated the activity in a cell, the greater the need for written performance standards to be available to students. For cells in the Matrix that contain simple activities, a simple standards checklist is sufficient. However, when a more sophisticated cell in the Matrix is addressed over several class periods, it is beneficial to have a full-blown rubric. It is the job of StandardWriter to make this process more time efficient, and to ensure that teacher-made rubrics are of high quality.

Rubric construction and implementation is also an integral part of the Model Classrooms Project (see below). Teachers who are working in study groups during month three (product strategy month) and month four (assessment strategy month) will want to develop and implement rubrics for the products that they deem essential, whether the products will be incorporated into units of study, used with textbook-driven instruction, or otherwise. The more sophisticated and long term the objective, the greater the need for clear, high performance standards for students.

The Model Classrooms Project: A Study Group Approach to Developing Instructional Excellence

The Model Classrooms Project (MCP) focuses on developing the instructional strategies used by teachers throughout a school or district in order to bring about increasing levels of student success. MCP is comprised of minimal workshop time, but instead, focuses on study groups where instructional strategies are discussed, and classroom visitations where successful practices are documented via digital photography and shared throughout the agency. Quality expert W. Edward Deming estimates that 85% of the barriers to improvement reside in an organization's structures and processes, not in the performance of individuals (National Staff Development Council, 1995). The Model Classrooms Project is designed to develop an organization's infrastructure to embed experimentation with new instructional strategies within the culture of the agency. Dewey (1933) and Black (2001) advocate that teachers should think systematically about practice to improve teaching. In order to provide this critical element, the MCP organizational design includes structured study groups and classroom visitations.

The Model Classrooms Project begins with initial staff development which overviews the Curry/Samara Model and describes strategies for year-long implementation. After the initial staff development is completed, teachers and administrators each engage in brief (45 minute) study groups, six times throughout the school year (Figure 5). Each monthly meeting focuses on one of the six categories of instructional strategies that are embedded within the CSM Unit Lesson Plan and which are described below. This incremental, ongoing approach to organizational development is a realistic way in which to foster discussion of a list of approximately fifteen, category-specific

strategies each month. In addition, each participating teachers writes a goal statement per month, for which new strategies will be added to the growing "toolbox" used by each teacher.

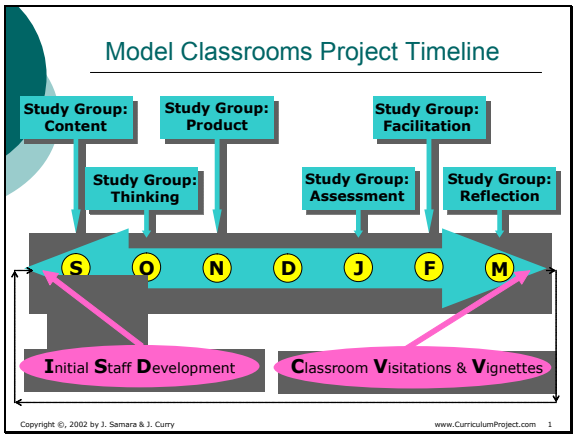

Figure 5: Model Classrooms Project Timeline

Accountability is an essential factor in the Model Classrooms Project, and beyond written goal statements, there are regularly scheduled, brief administrator walk-throughs and classroom visitations/vignettes conducted by an outside consultant or someone internal to the agency. The purpose of the brief walk-through and the forty-five minute visitation is to identify, label, and celebrate promising practices that are observed. The National Staff Development Council (1995) supported the belief that classroom observation, feedback, and reflection assist teachers in improving instructional practice. Through notes to teachers, discussion with faculty members, vignette viewing, articles in school newsletters, and the like, success with the Project stays in the forefront as a means of fostering a culture focused on increasingly excellent instruction. As stated in the National Staff Development Council's Standards for Staff Development (1995), staff development should include high-quality ongoing training programs with intensive follow up and support.

The six categories of instructional strategies that drive the Model Classrooms Project study groups, walks-throughs and classroom visitations/vignettes are depicted in figure 6. These are the same six categories of instructional strategies that are built into the lesson plan component of UnitWriter as menus from which teachers may select strategies from categorized lists. Each of the six categories is described below.

Content strategies involve how the teacher will orchestrate the acquisition of the state mandated information and skills that students are to learn as related to a lesson. Several examples of content strategies include: (1) opening a lessons with prior knowledge questions; (2) using graphic organizers to visually organize information for students; and (3) accessing information via the computer and the Internet to augment other informational sources.

Thinking strategies involve the cognitive tools that students use to process content. The thinking skills strategies are comprised primarily of metacognitive strategies in which teachers label the levels of thinking (knowledge, comprehension, application, analysis, creative thinking, and critical thinking) that students are using, define the cognitive verbs related to the activity (summarize, infer, justify, etc.), and ask questions at all levels by inserting cognitive verbs into questions. Metacognitive practices are supported by Ming Su, Masoodi, Kopp, & Klonowski (1998), in recognizing that metacognition, or thinking about thinking, must be emphasized.

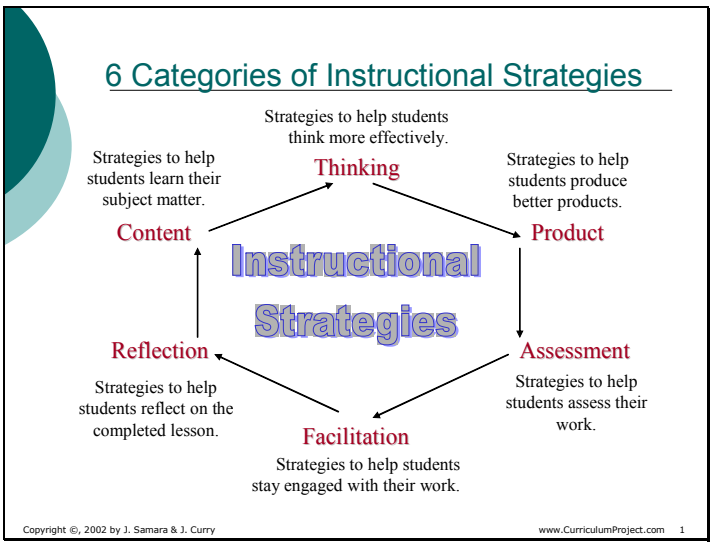

Figure 6: Categories of Instructional Strategies

Product strategies are used to ensure that students have time to produce small, varied work samples within virtually every lesson. As students produce written, visual, kinesthetic, and oral products, they construct meaning as opposed to passively absorbing information. Student products also allow students to demonstrate understanding of the content within a lesson, and the teacher many gain useful information about the efficacy of the lesson as students engage in meaningful tasks. By examining products that students create, teachers gain feedback on the effectiveness of instruction (Day & Skidmore, 1996).

Assessment strategies involve actions such as presenting articulate performance standards before students begin their work, and emphasizing self and peer critique (formative assessment) as a prelude to teacher critique (summative assessment). Assessment involves the use of objective language in defining standards for quality work, and feedback (self, peer, teacher) to students concerning their achievement in reaching these standards. McTighe (1996) states "the principle of establishing clear performance targets and the goal of teaching for understanding fit together as a powerful means of linking curriculum, instruction, and assessment."

Facilitation strategies relate to the actions that teachers employ to ensure that students are actively engaged in meaningful work. Prior to student work time, teachers establish parameters for success and during student work time the teacher circulates, assess, encourages and otherwise reinforces the parameters for success that were established at the onset of the lesson.

Reflection strategies can be effective during any part of the lesson cycle, but they are essential as a mechanism for closing a lesson. During the last several minutes of a class, teachers elicit reflective statements (oral and/or written) as a means of summarizing the content, reviewing the activities, and establishing the relevance of the lesson. The importance of facilitation is confirmed by McTighe (1996) when stating that research and experience confirm that when students perceive classroom activities as meaningful and pertinent they are more likely to have a positive attitude toward them. During reflection, teachers and students engage in a process that allows them to consider and examine their practice (Pope, 1999).

Research

For the past ten years, components of the Curry/Samara Model® have been implemented in Texas, Illinois, Ohio, and other areas. One example of successful implementation and the context for several research studies occurred in Aldine Independent School District (AISD) in Houston, Texas. MCP was implemented in the McArthur Vertical Team which is composed of McArthur High School and the feeder campuses. 70 percent of the students in McArthur Vertical Team are Hispanic and approximately 80 percent are considered economically disadvantaged.

Over an eight-year period student state assessment data indicate significant increases in student performance. The following studies outline the significant student achievement gains.

Henderson (2000) describes the success of implementation of vertical teaming and incorporation of the Curry/Samara Model® in the McArthur Vertical Team. State assessment data indicated drastic increases in student performance at the high school, from 1994 through 1999. In further examination, the MacArthur Area performance for both 2001 and 2002 show all three areas with a passing rate of over 90%, peaking in 2002 at 95.2 for reading, 97.4 for math and 94.5 for writing.

MacArthur High School; Aldine ISD (1994 – 1999 Texas Assessment of Academic Skills)																		
Reading							**Math**						**Writing**					
% Passing – All Students							**% Passing – All Students**						**% Passing – All Students**					
'99	**'98**	**'97**	**'96**	**'95**	**'94**		**'99**	**'98**	**'97**	**'96**	**'95**	**'94**	**'99**	**'98**	**'97**	**'96**	**'95**	**'94**
89	**84.9**	**82.6**	**72.7**	**71.4**	**64.5**		**82**	**74.7**	**66.7**	**56.1**	**48.1**	**43.9**	**88.6**	**85.1**	**87.3**	**80.4**	**86.1**	**73.8**

Additionally, the Curry/Samara Model was a component of a dissertation study conducted by Patin (2000). The purpose of Patin's five-year study was to examine teachers' perceptions of benefit from participation in long-term inclusion staff development. The study employed a survey designed to correlate with the parts of the Model used and the goals of staff development. The survey served as a focal point for the assessment of teachers' perceptions of participation in the training and anecdotal information provided for in-depth perspectives of the statistical results. The statistical findings of the study supported the null hypothesis: There is no statistical difference between general education teachers and special program teachers in their perceptions of benefit as a result of participation in an inclusion curriculum staff development. Furthermore, the findings indicated that collaborative staff development that includes the Curry/Samara Model® assists districts in utilizing special program funds and personnel more efficiently to develop consistent standards of excellence for all students.

The most extensive study to date of the MCP and CSM was conducted by Connell (2003). Connell's research report addresses two areas concerning the Curry/Samara Model®: empirical evidence to support the use of CSM and positive benefits accruing from continuing use of CSM over time. Two parallel elementary schools were carefully selected from Aldine Independent School District, a control and a treatment elementary. The schools chosen for participation in this study were carefully matched on a number of important variables including: gender, Title 1A status, educational at-risk classification, etc. Although a perfect match is rarely possible in educational research, these schools were found comparable in most areas, and in several areas the control school was initially in a more favorable position. The control elementary was described by district administrators and personnel as not significantly participating in the Curry/Samara Model, and the treatment elementary was described as participating in the Curry/Samara Model at a high level. This high level included training in CSM for curriculum unit writing and product guide creation, ongoing support in the writing process and participation with the vertical team in implementation of all aspects of the Model Classrooms Project.

The primary research concerns were addressed by a two-part research and evaluation scheme – Analysis of Variance (ANOVA) and Student-Problem Analysis (S-P Chart). *Texas Assessment of Academic Skills* data for 1997 through 2002 were used for the analyses. According to Connell, "Whether examining the ANOVA analyses, the preliminary S-P group analysis, or the Student-Problem Curve analysis the end implication is clear. We see a highly successful program which offers a continuous and consistent framework within which student growth and performance is enabled. Furthermore, this program creates statistically significant and measurable results when compared with a comparable population. Nor are these results merely of statistical importance. Based upon the Student-Problem Chart numerous qualitative differences were found regarding the nature and type of student learning as well as the instruction being offered in these two systems. In each case the Curry/ Samara Model® provides for a significantly richer environment within which learning takes place" (pp. 44-45).

Mullenix (work in progress) examines the effects of specific, written, student centered mathematics curriculum on the mathematic achievement of gifted and general student populations in public school. In particular, his study describes the effect of a two-year gifted and talented mathematics curriculum based on the Curry/Samara Model®. A one-group pretest/posttest research design was implemented using the Iowa Test of Basic Skills mathematics sections to measure mathematics achievement. This study documented statistically significant differences (t-test for paired samples yielded a t of 8.52 that was statistically significant ($p<.001$) and an educationally significant effect

size of (+0.34)) between the mathematics achievement of students at the end of sixth grade who participated in a two-year curriculum based on the Curry/Samara Model and a control group from the same school (p. 28-29).

Conclusion

The Curry/Samara Model® utilizes techniques, skills and strategies to support the articulation and implementation of instructional strategies aimed at improving the performance of mixed ability students in the classroom. The complex process of writing differentiated curriculum and product and performance assessment tools is facilitated by the use of UnitWriter and StandardWriter software. In addition, these instructional strategies are the foundation of the processes and structures for teacher training that are adopted with the Model Classrooms Project, and it's focus on organizational effectiveness.

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