Efficacy of Understanding by Design Implementation Plan: Evaluated through Teacher Perceptions and Student Outcomes

by

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Dissertation
Presented to the Faculty of the Graduate School of
St. John’s University
in Partial Fulfillment
of the Requirements
for the Degree of
Doctor of Education
CHAPTER 1

INTRODUCTION

Background

New York State released the *New York State Common Core 9-12 Social Studies Framework* on [www.engageny.org](http://www.engageny.org) February 8, 2013. The following curriculum guidelines accompanied the framework: Students will develop an understanding of concepts and key ideas. Students will be assessed on their understanding of key ideas, as well as conceptual understandings. Districts and teachers will have increased decision making power about how to teach and illustrate conceptual understanding and key ideas to promote student understanding. The document specifically states that the guidelines mentioned are to prepare students to be college and career ready. The Common Core State Standards identify college and career readiness as student ability to analyze, apply, make inferences, assess point of view, evaluate, produce, draw evidence, model, reason, and construct. The introduction to the *New York State P-12 Common Core Learning Standards for English Language Arts and Literacy*, was published on June 2, 2010 stating, “the skills and understandings students are expected to demonstrate have a wide applicability outside the classroom or workplace.” The goal of transferring understandings from one key idea, in one discipline, to a wider scope with the intent of deepening student understanding of a concept has been evaluated through research in cognitive psychology and advocated by constructivist educational theorists.

“Transfer” is defined as the ability to apply knowledge or procedures learned in one context to new contexts (Lightner, Bernander, Kramer, 2008). Student and faculty attitudes toward participating in transfer activities, existing pedagogical initiatives, and district approach toward professional development are current barriers to educating for meaning and
understanding through transfer (Lightner, Benander, and Kramer, 2008). Additionally, a 2005 study determined that teachers have difficulty modeling transfer of instructional outcomes they practice in professional development, “teachers taking lessons or activities from professional development into their classroom, often to ill effect.”(Hill, 2009) “Cognitive psychology research indicates that student learning is enhanced when students are able to explore, organize, connect, process, and apply information and ideas….When students are engaged in the learning process through the use of authentic pedagogy and academic performance tasks that enable them to apply their learning.” (McTighe and Seif, p. 11). These key ideas have been developed by Grant Wiggins and Jay McTighe within their Understanding by Design (UbD) framework, which encourages educating for meaning and understanding to improve student achievement. The terms “meaning” and “understanding” are identified as the ability to, “put facts into a larger context, inquire into ‘essential’ questions, and apply learning in authentic situations. In order for students to become knowledgeable and competent in a field of study, should not only develop a solid foundation of factual knowledge but also develop a conceptual framework of concepts and ideas that facilitates meaningful learning.” (McTighe, 7)

Grant Wiggins and Jay McTighe outline the long term purpose of schooling, “the mission of high school is not to cover content, but rather to help learners become thoughtful about, and productive with, content. It’s not to help students get good at school, but rather to prepare them for the world beyond school, to enable them to apply what they have learned to issues and problems they will face in the future. The entire high school curriculum, course syllabi, instruction, and especially assessment must reflect this central mission, which we call learning for understanding. Learning for understanding requires that curriculum and instruction address three different but interrelated academic goals: helping students 1. acquire important information
and skills, 2. make meaning of that content, and 3. effectively transfer their learning to new situations both within school and beyond it.” (Wiggins & McTighe, 37).

The Understanding by Design (UbD) instructional framework is closely aligned with the New York State Learning Standards goal of supporting the college and career readiness of every student through the promotion of student understanding through the application of learned content to prior knowledge. However, this constructivist approach has been supported by a number of instructional leaders prior to the June 2010 introduction to the New York State P-12 Common Core Learning Standards for English Language Arts and Literacy. The support for the Understanding by Design (UbD) instructional framework, and its guided implementation within school districts, has been occurring over the last several decades. The support for UbD, or any other initiative is really just the first step. The implementation plan is only as effective as it is supported by teachers, and utilized within each classroom. This next step will be evaluated through teacher perceptions of the UbD instructional framework and their role in the implementation plan. Additionally, student outcomes will be evaluated as well. This framework can be applied to the curriculum reform New York State has mandated over the recent months, particularly because there is support from the field of cognitive psychology that this type of learning will encourage our students be college and career ready by demonstrating their ability to think differently.
Purpose of the Study

The purpose of the study is to determine the efficacy of the Understanding by Design instructional framework by evaluating the implementation process. Several Long Island school districts will be investigated: Larkfield High School of the Larkfield School District, Morgano High School of the Morgano School District, Reagan Middle School of the Candlewood School District. Teacher understanding of, and level of implementation regarding, the Understanding by Design instructional framework will be investigated through the use of the Concerns Based Adoption Model. The level of exposure to the UbD instructional framework will be evaluated based on level of teacher participation in training, workshops, and other forms of professional development. Then a “Stages of Concern” instrument will be used to evaluate the level of teacher concern with the implementation of the initiative. This evaluation is intended to determine a level of concern teachers have regarding the impact of the Understanding by Design instructional framework on their planning and instruction. That concern will be measured through three levels: 1. Concern for Self; 2. Concern for Task; 3. Concern for Impact.

Statement of the Problem

School districts have been tasked with the responsibility to create instructional experiences where students are evaluated based on their ability to demonstrate understanding, to be truly “college and career ready.” The efficacy of the implementation of a framework with the intended goal of identifying, within each unit of each discipline: 1. desired results through specific understandings promoted through essential questions; 2. Purposefully designed authentic performance tasks to provide assessment evidence; 3. Learning plans with activities to promote understanding and success on performance tasks; needs to be evaluated. The intended objective
of the framework can only be achieved if teachers fully understand, and support the initiative. Then re-evaluating and transforming their pedagogical practices where necessary. The problem is the existence of teacher concern for being willing to adopt a new initiative beyond, as mentioned in the Stages of Concern scale, “a general awareness of the innovation (in this case Understanding by Design) and interest in learning more detail about it…” to a level where coordination and cooperation with others, and even offering constructive alternatives that may “work better.” To what level are teachers willing to be a proactive participant in pedagogical change? Are teachers willing to reform their practice?

Research Questions and Hypotheses

If teaching for meaning and understanding is prioritized universally in national, state, and local education reform, the efficacy of an implementation plan which guides the transformation of a school system to reach that goal is worth evaluating.

1. “What concerns do teachers feel about Understanding by Design? (I hope to discover the range of concerns teachers have relative to the adoption and use of Understanding by Design as an instructional framework. The answer to this question will help explain the existing level of individual and school wide adoption and implementation of the framework.)

2. To what extent are teachers using Understanding by Design in their instructional practice? (I hope to identify the varied levels of use of the Understanding by Design framework by the high school faculty. The answer to this question will clarify the existing level of individual and school-wide use of the framework.)
3. What local interventions are needed to accelerate the pattern of adoption and effective use of the Understanding by Design instructional framework? (I hope to identify professional development strategies that can serve as effective interventions for advancing the use of Understanding by Design by the high school faculty. The answer to this question will provide a foundation for the development of action plans designed to move the faculty’s use of the innovation to a higher, more refined level.)” (Young, 2005, p43)

*Conceptual Framework*

The Concerns Based Adoption Model (CBAM) is a conceptual framework used to study the process of implementing change. In this case the introduction and implementation of the Understanding by Design (UbD) instructional framework by teachers, in the role of change facilitator, will be measured. The theoretical context for the model can be found in the work of counseling psychologist Frances Fuller’s sequential developmental concept of concerns (1969). “Fuller conducted research on the concerns of student teachers and developed a model based on her empirical finding that student teachers’ concerns moved through a natural development sequence of four stages: unrelated, self, task, and impact. Unrelated concerns are personal in nature and do not address the concerns of the teaching practice. Self concerns, although focused on teaching practice, are egocentric in nature. Task concerns are logistical in nature, that is, they are directed towards the mechanics of instructional delivery. Impact concerns, the highest level in Fuller’s hierarchy, address the impact of teaching practice on students. “(Young, 2005, p.49)

“Concerns Based Adoption Model was based on several important assumptions about the nature of change. These assumptions are: 1. Change is a process, not an event. 2. Change is accomplished by individuals. 3. Change is a highly personal experience. 4. Change involves
developmental growth in feelings and skills. 5. Change can be facilitated by interventions directed toward the individuals, innovations, and contexts involved (Hall & Hord, 1987, 2001)” (Young, 50)

“The full CBAM model contains three separate measures for quantifying change in individuals: the SoCQ, Levels of Use Survey, and Innovation Configurations. The SoCQ describes six stages of feelings and motivations a teacher may experience during implementation of a new curriculum or instructional practice.”

Hall and Hord (1987) noted that educational reforms are often not implemented in the time frame envisioned by the planners and policymakers. While that may be the result of structure or planning problems, resistance to change, not unique to educational settings, is frequently a factor in timing of implementations (Christou et al., 2004). Both of these observations reinforce the importance of investigating the nature of teacher concerns during the innovation process. Loucks-Horsley (1996), one of the original test developers, points out that learning brings change, and supporting people during change is critical to facilitating the change taking hold. It is, therefore, helpful that the CBAM applies to anyone experiencing change, be they policymakers, teachers, parents, or students. Most users of CBAM believe all people experiencing change evolve in the kinds of questions they ask and in their use of whatever the change is. CBAM allows identification of the stage and helps leaders prepare to meet the needs of the adopters. Later research suggests not all teachers progress through all stages. Some become comfortable with the innovation (Stage 3) and do not progress to concern regarding impact on students (Stage 4 and beyond; Anderson, 1997).” (Malmgren, 73)

<table>
<thead>
<tr>
<th>Title</th>
<th>Stage</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>0</td>
<td>Awareness</td>
<td>Has little interest or knowledge of the change, or innovation.</td>
</tr>
<tr>
<td>Task</td>
<td>Management</td>
<td>Occurs with experimentation with the change. Concerns focus on logistics and new behaviors associated with practice of the innovation.</td>
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<td>-------</td>
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</tr>
<tr>
<td>Impact</td>
<td>Consequence</td>
<td>Concerned with impact of change on students in their own classroom. Begins to consider modifications and improvements in the innovation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collaboration</td>
<td>Interest in working with other teachers to improve benefits of the change.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refocusing</td>
<td>Considering major modifications or replacement with a new innovation.</td>
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“Role of the Facilitator: Another key theoretical component supporting the CBAM model is that change, or interventions, can be facilitated. Facilitators serve as change, or adoption, agents, creating a relationship between user and resource systems. The facilitator monitors changes in individuals, the organization, and the innovation. A primary role of the facilitator is to functionally model the adoption process. Consultation and structured training are needed by adopters at the initial implementation stages. Demonstration and consultation are appropriate at later stages, while questioning, consultation, and dialog are common needs of adopters throughout all stages (Hall et al., 1973). In the research reported by Anderson (1997), facilitators work in three primary styles- initiators, managers, and responders-and initiators tended to be most successful. They often functioned as a team with an outside consultant who served as an additional teacher or facilitator.”(Malmgren, 74)
Methodology

This study will use qualitative methods of data collection to evaluate the meaning, and ultimate efficacy, for the adoption and used of the Understanding by Design (UbD) instructional framework. The study will review, and replicate, the instrumentation utilized in previous action research, and apply to a case study in its, “real world context.” (Yin, 17) “A team of researchers at the University of Texas Research and Development Center developed a conceptual model and set of related diagnostic tools with which to study the adoption and implementation of educational innovations at the teacher level. This model has been widely used since its introduction in the 1970s. The model’s fundamental insight is that change is a process, not an event, and teacher feelings about and uses of an innovation tend to proceed along developmental continua (Hall & Hord, 1987, 2001).” (Young, 2005, p.150) As teachers “progress” through the stages of implementation for any innovation, a level of intrinsic support to be part of the shared decision making process exists. “Shared vision is vital for the learning organization because it provides the focus and energy for learning….It creates a sense of commonality that permeates the organization…occurs only when people are striving to accomplish something that matters deeply to them.” (Senge, 192).

“The model offers three diagnostic tools that were of interest to the research team. First, the Stages of Concern Questionnaire is a 35-item instrument that measures how teachers feel about an innovation. The questionnaire has an accompanying scoring guide that places a teacher on a continuum from concerns about the self to concerns about the impact on the innovation on students. Second, an Innovation Configuration is a construct that researchers can use to develop word-pictures of what the innovation looks like in practice. This word-picture, or rubric, is useful
when matching teacher actions against the innovation’s range of adaptive uses. Third, Levels of Use as a construct pertains to how teachers ‘act or behave with a change’ (Hall & Hord, 2001, p. 81). It has to do with implementation of the innovation; that is, how faithful is a teacher’s practice to the innovation’s precepts?” (Young, 2005, p. 81-82)

Limitations

Similar studies have identified the limited scope of the study, particularly if the CBAM was applied to a single case study to help guide an action plan for a particular school. Although the scope of this study attempts to develop a level of perspective by comparing teacher perceptions regarding the implementation of Understanding by Design (UbD) across three different school districts on Long Island, the districts are similar in defining characteristics which may have impacted the efficacy of the initiative.

Definition of Terms

Learning is the act or process of acquiring knowledge or skill. Learning is not the goal, it is the means (Wiggins)

Meaning is what is intended to be, the significance of the intended outcome.

Professional Development is the advancement of skills or expertise to succeed in a particular profession.

Transfer is the ability to extend what has been learned in one context to new contexts. Educators hope that students will transfer learning from one problem to another within a course, from one year in school to another, between school and home, and from school to workplace. Assumptions about transfer accompany the belief that it is better to broadly “educate” people than simply “train” them to perform particular tasks. (Wiggins)
Understanding is the expression of familiarity with a particular outcome by exhibiting comprehension.

*Understanding based teaching practices* Instructional strategies that emphasize and measure deep understanding over retention of facts.

*Understanding by Design (UbD)* reflects the convergence of two interdependent ideas: (1) research on learning and cognition that highlights the centrality of teaching and assessing for understanding, and (2) a helpful and time honored process for curriculum writing (Wiggins & McTighe, 2005).

**Significance of Study**

This study will be significant for a variety of reasons and to various groups. Since the instructional framework being studied aligns with the concepts, content, and skills required by the New York State and Common Core Learning Standards, more districts will be encouraging the implementation of this instructional framework, or one with similar components, it will be valuable for building and district administrators to review the efficacy of the implementation of the instructional framework in several districts. Additionally, the districts that are participating in the study will be able to engage in a comparative analysis of the study regarding teacher perceptions of UbD implementation. The results of the comparative analysis will serve as the outcomes which will inform the district leadership of the efficacy of the implementation process. Finally, the data regarding the efficacy of the implementation of UbD in three school districts will guide the implementation process of instructional initiatives in other districts going forward.
Organization of Study

The research is organized into five chapters, a bibliography, and appendixes. Chapter two is a review of the current literature related to the topic. Chapter three explains the research methodology including the research design, methodology, population and sample, instrumentation, data collection process, and interpretation and analysis of the research. Chapter four discusses the data and findings. The summary, conclusions, and recommendations of the research study are presented in chapter five. The bibliography and appendixes conclude the research study.

CHAPTER 2
LITERATURE REVIEW

We begin by analyzing school reform in the 21st Century (Common Core, International Baccalaureate, Advanced Placement) within the context of standards based expectations. New York State Standards have recently, and will continue, to be revised within each discipline to promote college and career readiness. Student demonstration of being college and career ready can be attained through the application of learned content to prior knowledge to demonstrate understanding. To what extent are school districts creating instructional experiences where students are evaluated based on their ability to demonstrate understanding, to be truly “college and career ready?” Research in cognitive psychology supports the claim that making meaning of information and applying it to new situations within and beyond school will enable our students to not just demonstrate understanding to attain short term success, but will actually think differently. An evaluation of the barriers to the emphasis of this type of curriculum reform must
be explored. To what extent are school districts, who have incorporated Understanding by Design (UbD) into its curriculum framework to support CCLS, College Board AP, and International Baccalaureate curriculum and assessment, measuring the efficacy of the Understanding by Design implementation plan?

Consciousness regarding the process of learning, and demonstration of understanding as an expected outcome have been prioritized and legislated through the adoption of Common Core Learning Standards and revision of content area instructional frameworks on the state level. The emphasis on the process of learning, and demonstration of understanding, has caused College Board to revise Advanced Placement approach to curriculum and assessment. “Curriculum development for the new and redesigned AP courses adopts the methodology of Understanding by Design, which proposes that curriculum design should begin with clearly defined learning outcomes and then articulate the evidence needed to confirm that the learning outcomes have been met.” (https://aphighered.collegeboard.org/exams/course-exam-revision)

Additionally, the number of authorized International Baccalaureate world schools has significantly increased on a local and international level. The revised instructional frameworks, assessment expectations, and implementation of school and district wide cultural shifts in instructional design is contingent on the transformation of the classroom to prioritize teaching for meaning and understanding. “The International Baccalaureate program employed the UbD framework to redesign the template for its Primary Years Program (PYP), a curriculum used worldwide.” (McTighe & Seif, 15) Further research will be conducted to identify the concepts, content, and skills needed to perform at the highest level in advanced courses and truly be college and career ready.
A summary of the pasty thirty years of research in learning and cognition supports the importance of learning with understanding (Bransford, Brown and Cocking, 2000, p.8). One avenue of this research explored the differences between novices and experts in various fields. Psychologists learned that experts have more than a large body of information- they actually think differently from novices. “Usable knowledge is not the same as a mere list of disconnected facts” (p. 9); “…expertise requires well-organized knowledge of concepts, principles, and procedures of inquiry” (p. 239). The research suggests that students, in order to become knowledgeable and competent in a field of study, should not only develop a solid foundation of factual knowledge but also develop a conceptual framework of concepts and ideas that facilitates meaningful learning (McTighe and Seif, 2003).

Further research will be conducted, including an evaluation of Jean Piaget’s 1974 work, “To Understand is to Invent: The Future of Education” to explore the relationship between learning, cognition, and understanding. “A student who achieves a certain knowledge through free investigation and spontaneous effort will later be able to retain it; he will have acquired a methodology that can serve him for the rest of his life, which will stimulate his curiosity without the risk of exhausting it. At the very least, instead of having his memory take priority over his reasoning power, or subjugating his mind to exercises imposed from the outside, he will learn to make his reason function by himself and will build his own ideas freely….Is it enough for the student to listen for years to lessons, in the same manner as the adult listens to a lecturer, for logic to be created in the child and adolescent? Or does a real formation of the tools of the intellect require a collective atmosphere of active and experimental investigation?” (Piaget, 95-96)
“Evidence of understanding that is transferable involves assessing for students capacity to use their knowledge thoughtfully and apply it effectively in diverse settings - that is to do the subject. As the authors of How People Learn (Bransford, Brown & Cocking, 2000) write, ‘Students’ abilities to transfer what they have learned to new situations provides an important index of adaptive, flexible learning….Many approaches to instruction look equivalent when the only measure of learning is memory….Instructional differences become more apparent when evaluated from the perspective of how well the learning transfers to new problems and settings. (p. 235) Students develop flexible understanding of when, where, why, and how to use their knowledge to solve new problems if they learn how to extract underlying principles and themes from their learning exercises. (p. 224) The point is nothing new. Bloom and his colleagues (1956) made the same point about ‘application’ in the Taxonomy 50 years ago. An assessment of application had to involve a novel task, requiring transfer; and it ideally involved contextualized and practical use of ideas: If the situations…are to involve application as we are defining it here, then they must either be situations new to the student or situations containing new elements….Ideally we are seeking a problem which will test the extent to which an individual has learned to apply the abstraction in a practical way. (p. 125).”(UbD, 49)

Research in cognitive psychology, instructional initiatives, and academic achievement has validated that educating for meaning and understanding through transfer will enhance student achievement (McTighe, and Seif, 2003). This research is to evaluate the implementation process of the Understanding by Design (UbD) instructional framework, developed by Wiggins and McTighe, within three schools on Long Island (two high schools and a middle school). The intended outcome of this research will be to improve the individual and school-wide use of
understanding based teaching practices as well as guide the process for future implementation of school wide instructional initiatives.

“Teachers’ concerns have been conceptualized as classifiable into two types: concerns about benefit to self and concerns about benefit to pupils (Fuller, 1969).” (Fuller, 1974). “Concerns about teaching are expressions of felt need which probably possess motivation for relevant learning. Consequently, any regularities in the concerns of teachers are of interest to teacher educators. If motivation is to be harnessed for learning, curricula should consider the felt needs or concerns of teachers.” (Fuller, 1974). Review of Irene Malmgren’s 2010 study of faculty development in community college teachers in learning community teaching teams using the Concerns Based Adoption Model (CBAM). The CBAM recognizes that change is a process, not an event. Change is accomplished by individuals. Change is a highly personal experience. Change involves developmental growth in feelings and skills. Change can be facilitated by interventions.

CHAPTER 3
METHODOLOGY

“The model offers three diagnostic tools that were of interest to the research team. First, the Stages of Concern Questionnaire is a 35-item instrument that measures how teachers feel about an innovation. The questionnaire has an accompanying scoring guide that places a teacher on a continuum from concerns about the self to concerns about the impact on the innovation on students. Second, an Innovation Configuration is a construct that researchers can use to develop word-pictures of what the innovation looks like in practice. This word-picture, or rubric, is useful when matching teacher actions against the innovation’s range of adaptive uses. Third, Levels of
Use as a construct pertains to how teachers ‘act or behave with a change’ (Hall & Hord, 2001, p. 81). It has to do with implementation of the innovation; that is, how faithful is a teacher’s practice to the innovation’s precepts?” (Young, 2005, p. 81-82)

Advantages and disadvantages to this instrument are, “a structured instrument requires that the instrument developer select the content to be presented to subjects. Such selection may eliminate the very concerns which we most need to observe. In order to allow unrestricted reporting of concerns, but to permit a larger survey then is possible using transcripts or correspondence, development was undertaken of a free response instrument and a content analysis system.” (Fuller, 1974, p. 3-4) The “Stages of Concern” questionnaire is to identify a profile of concern regarding the Understanding by Design instructional initiative. “Whereas Stages of Concern has to do with feelings and perceptions, Levels of Use (LoU) focuses on the knowledge, skill, and behavioral aspects of the implementation of UbD. Levels of Use will be identified by observation and follow up conversations.” (Young, p. 194) The following two questions will be explored to evaluate the implementation. “1. Do you think the profile accurately reflects your feelings and perceptions of Understanding by Design? Why or why not? 2. What specific things would have to be in place for you to feel more positively about the implementation and use of Understanding by Design?” (Young, p. 195). Follow up interviews will occur to address the teachers’ use of the principles of UbD across his/her practice.

Teacher input regarding the protocols to be put in place to create a more positive culture and more effective implementation supports the idea that shared vision, “…has staying power and an evolving life force that lasts for years, propelling people through a continuous cycle of action, learning, and reflection.” (Senge, p.87). This framework reflects a developmental shared vision strategy where, “all stages of the process should help build the leadership capacity of
everyone in the system: the people at the top of the school system hierarchy (who must convene and foster a generative conversation) and the rest of the participants (whose commitment will make all the difference to realizing this vision.)” (Senge, p.89)
Context of Standards Based Expectations (CCLS, state, etc.)

College and Career Readiness in Reading:
http://www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf

College and Career Readiness in Writing:
http://www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf

The Science of Learning Particularly Cognitive Psychology


School Reform in the 21st Century (IB, AP)


History and Empirical Support of Understanding by Design


Conceptual Framework (Concerns Based Adoption Model)


Constructivist or Understanding Based Instructional Practices


VanDeWeghe, R. Teacher Understanding of Student Understanding. English Journal, 93, (6), 89-92


School Professional Development and Implementation of Instructional Initiatives


