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# A First-Year Implementation of Mindquest21, A Project-Based Paradigm Shift to Deeper Learning: A Program Evaluation

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A FIRST-YEAR IMPLEMENTATION OF MINDQUEST21,  
A PROJECT-BASED PARADIGM SHIFT TO DEEPER LEARNING:

A PROGRAM EVALUATION

Deborah Rosalia Esparza

Educational Leadership Doctoral Program

Submitted in partial fulfillment

of the requirements of

Doctor of Education

In the Foster G. McGaw Graduate School

National College of Education

National-Louis University

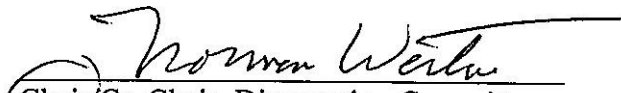
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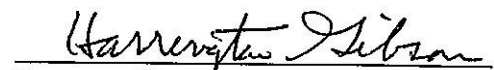
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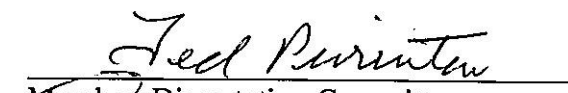
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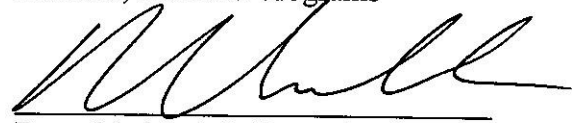
  
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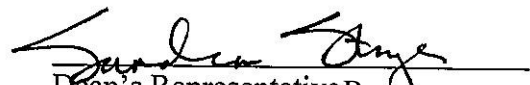
  
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## ABSTRACT

This program evaluation examines MindQuest21, a project-based learning (PBL) model that was implemented in a Chicago, Illinois suburban community. It began with a summer institute experience with a group of approximately seventy teachers in grades kindergarten through fifth grade. These teachers volunteered to attend a four-day MindQuest21 professional development seminar where they actively participated in a facilitated PBL model of instruction and collaborated on the development of PBL units within their district. A pre-post survey was used to compare teacher confidence increases and PBL understanding after the summer institute. This was followed by teacher interviews, follow-up sessions, classroom visits, and examinations of student artifacts. This study aims to be a resource for other school districts interested in implementing a highly collaborative PBL professional learning process within their school community. Data collected throughout the first-year implementation served as invaluable formative and summative information sources to identify specific themes and recommendations. Conceptual frameworks structure the recommendations in categories of strategic action. These recommended actions include; shifting from traditional staff development to professional learning systems, building internal sustainability for change, exploring stakeholder belief systems, moving from curriculum delivery to investing in curriculum development, and fostering environments where learning is optimized through active experiences. The research reveals insights and provides direction for educators seeking to transform their teaching and learning practices to meet the needs of our expanding and diverse 21<sup>st</sup> Century students.

## ACKNOWLEDGEMENTS

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In addition, many thanks to Mr. James Bellanca and the Illinois Consortium for 21<sup>st</sup> Century Schools for inviting me to be an integral part of this exciting and transformative professional development endeavor. With gratitude to the many teachers and administrators who contributed their time, genuine efforts, suggestions for improvement, and professionalism during this study.

I'd like to also thank my family and friends who were there for me in so many supportive ways. I am truly blessed to have been raised by proud Mexican parents who believed in a better life for their children. To my children, Joseph and Andrea, thank you for keeping me real. A special thank you to my dear friends; Dr. George Chipain, who helped me persevere during this important work, Mrs. Sulma Grigalunas, the kindest spirit I've ever known, and Mr. Thomas Avery, my lifelong colleague and friend who never stopped believing.

*"You haven't seen the best of me. I'm still working on my masterpiece."*

*Jesse J.*

## DEDICATION

For my mother, Piedad A. Esparza, my best teacher and life coach.

Thank you for your unconditional love.

## TABLE OF CONTENTS

	Page
ABSTRACT.....	i
ACKNOWLEDGEMENT.....	ii
DEDICATION.....	iii
LIST OF FIGURES AND TABLES.....	x
CHAPTER ONE: INTRODUCTION.....	1
Statement of Problem.....	2
Rationale.....	8
The MindQuest21 PBL Model.....	10
The MindQuest21 PBL Life Cycle Elements.....	11
<i>Element #1 – Define Essential Question.....</i>	<i>11</i>
<i>Element #2 – Launch.....</i>	<i>12</i>
<i>Element #3 – Gather Information.....</i>	<i>12</i>
<i>Element #4 – Organize Information.....</i>	<i>12</i>
<i>Element #5 – Communicate Concept.....</i>	<i>13</i>
<i>Element #6 – Assess (Formative) .....</i>	<i>13</i>
<i>Element #7 – Revise.....</i>	<i>14</i>
<i>Element #8 – Present Results.....</i>	<i>14</i>
<i>Element #9 – Assess (Summative).....</i>	<i>15</i>
<i>Element #10 – Reflect.....</i>	<i>15</i>
MindQuest21 PBL Life Cycle Summary.....	16



Goals.....	16
Research Question.....	18
CHAPTER TWO: REVIEW OF LITERATURE.....	20
Introduction.....	20
21 <sup>st</sup> Century Educational Goals.....	22
New Work Demands.....	24
Our Changing National Demographics.....	26
Successful Global Education Systems.....	26
The U.S. Contrast.....	28
New Student Populations.....	33
Testing, Testing.....	36
Teacher Roles and Responsibilities.....	38
Project-Based Learning.....	40
<i>High Tech High</i> .....	43
<i>The Met Network</i> .....	44
<i>Deeper Learning Network</i> .....	45
<i>New Tech High</i> .....	45
CHAPTER THREE: METHODOLOGY.....	48
Introduction.....	48
Program Evaluation Research Model.....	48
Research Questions.....	50
<i>Primary Research Question</i> .....	50
<i>Related Research Questions</i> .....	50

Participants.....	52
Setting: Progressive School District 21.....	53
Data Gathering.....	56
<i>Survey</i> .....	57
<i>Individual Interviews and Focus Groups</i> .....	58
<i>Observations</i> .....	59
<i>Teacher and Student Artifacts</i> .....	59
Data Analysis.....	60
<i>Survey</i> .....	60
<i>Individual Interviews and Focus Groups</i> .....	60
<i>Background Questions (1-3)</i> .....	61
<i>MindQuest21 Professional Development (4-9)</i> .....	61
<i>Implementation Process Questions (10-17)</i> .....	62
<i>Post Implementation Questions (19-30)</i> .....	62
<i>Observations and Artifacts</i> .....	62
Limitations.....	63
CHAPTER FOUR: FINDINGS.....	65
Survey Data.....	66
Survey Data Summary.....	76
Interview Data.....	77
Themes.....	78
<i>Theme One: PBL fosters more authentic learning</i> .....	78
<i>Theme Two: PBL increases teacher collaboration</i> .....	83

<i>Theme Three: PBL enhances the desire to learn in all students.....</i>	93
Interview Data Summary.....	97
CHAPTER FIVE: CONCLUSION.....	98
Primary Research Question.....	99
Related Research Questions.....	101
Recommendations.....	105
<i>Shift from Traditional Staff Development to Professional Learning Systems.....</i>	106
<i>Recommendation #1: Parallel the professional learning process to student learning. ....</i>	107
<i>Recommendation #2: Identify ongoing professional learning opportunities for systemic and sustainable instructional change. ....</i>	107
<i>Recommendation #3: Encourage a process for open communication around project based learning development.....</i>	108
<i>Build Internal Sustainability for Change.....</i>	108
<i>Recommendation #1: Identify and develop coaches, lead teachers, and/or specialists groups of teachers in effective PBL strategies.....</i>	109
<i>Recommendation #2: Identify key areas of teacher growth through a PBL framework at all levels of the organization.....</i>	110
<i>Explore Individual and Collective Belief Systems.....</i>	110
<i>Recommendation #1: Encourage difficult conversations.....</i>	111
<i>Recommendation #2: Align the change process with the school/district vision/mission.....</i>	111

<i>Move from Curriculum Delivery to Curriculum Development.....</i>	112
<i>Recommendation #1: Utilize Effective Technology Tools to Facilitate     Complex Instructional Shifts.....</i>	113
<i>Recommendation #2: Provide safe opportunities for teachers to develop     competence as PBL curriculum developers.....</i>	113
<i>Recommendation #3: Celebrate and share PBL progress and     reflections.....</i>	114
<i>Learn through Active Experiences.....</i>	115
<i>Recommendation #1: Develop strategies to engage students     in the change process.....</i>	116
<i>Recommendation #2: Build a PBL curriculum mapping process.....</i>	116
<i>Recommendation #3: Encourage new audiences for feedback of     student work.....</i>	117
Unexpected Discoveries.....	118
Final Thoughts.....	119
REFERENCES.....	122
APPENDIX A MINDQUEST21 TEACHER LETTER	
APPENDIX B SURVEY QUESTIONS	
APPENDIX C TEACHER INTERVIEW & FOCUS GROUP QUESTIONS	
APPENDIX D SUPERINTENDENT CONSENT LETTER	
APPENDIX E PARTICIPANT CONSENT LETTER	
APPENDIX F SAMPLE MINDQUEST21 PROJECT OVERVIEW - PG.1	
APPENDIX G SAMPLE MINDQUEST21 PROJECT OVEVIEW LINKS (1- 4)	

APPENDIX H COMPLETED PROJECT REPORT

APPENDIX I COMPLETED PROJECT REPORT

## LIST OF FIGURES AND TABLES

Figure 1: The MindQuest21 PBL Life Cycle.....	10
Table 1: Percent of Population by Selected Age Groups, 2000.....	30
Table 2: The Ten States with the Highest Child Poverty Rates.....	31
Table 3: Chicago Public Schools with High Percentages of Minority Students.....	32
Table 4: Top Ten States in which Persons Five and Older Speak a Language Other than English at Home.....	34
Table 5: Progressive School District 21 Student Characteristics Race/Ethnicity (2010-14).....	54
Table 6: Survey Data Summary.....	66
Table 7: Category Data Summary.....	75

## CHAPTER ONE: INTRODUCTION

One of the greatest challenges to improving our educational system is to collectively agree on what it is we want our children to contribute as adults in a global society. This is particularly difficult since our pluralistic society will always struggle with an ever-evolving definition of citizenship.

The world has a new profile. Our students are different from the era in which our parents grew up in. Technology has created new ways to communicate, but has also alienated us from one another. With the national adoption of the Common Core State Standards (CCSS), in the majority of the states across the country, curriculum, assessments, pedagogy, and overall school structures and environments will need to transition from traditional methods of teaching and learning to more student-driven, engaged, and empowered models which promote 21<sup>st</sup> Century skills, and inquiry based learning approaches such as Project-Based Learning (PBL).

PBL is an innovative approach to learning that teaches a multitude of strategies critical for success in the 21<sup>st</sup> Century. Our current traditional models of education are not working, particularly for minorities such as; English Language Learners (ELLs), low income, and other high risk groups of students. Education must go through yet another wave of reform, one in which schools will develop new paradigms; new boundaries and identities; and new relationships within schools and the community.

These paradigm shifts are already creating new ways to approach professional development for administrators, teachers, and school staff members. Several school districts across the country have already formed professional learning communities around these topics and are making great strides in alignments and infrastructure

improvements of their curriculum to the CCSS and preparing for either Partnership for Assessment of Readiness for College and Careers (PARCC) or Smarter Balanced assessments.

What are the needs for teaching in the 21<sup>st</sup> Century? (Banathy, 1990) identified five steps toward “the new learning agenda.” First, it is important to make a shift toward higher order learning. Second, it is vital to develop competencies in various technologies. Third, all of us must learn to manage and shape change, if not to thrive on chaos. Fourth, we must develop a range of skills for cooperation and collaboration, including communication skills as well as dispositions to nurture and care for others. Fifth, Banathy called for competence in systems thinking and action as a way for us to conceptualize and manage change, especially educational social reform.

#### Statement of Problem

Schools across the United States of America (U.S.) are making strong efforts to develop relevant curriculum models and new instructional approaches to optimally prepare students, as future decision-making citizens, to live and work in a rapidly narrowing global society. These school communities, through innovative and proactive school leaders, are re-focusing their resources on instructional methods that teach students to communicate and collaborate effectively with others. In addition, they promote and facilitate authentic inquiry instructional approaches which foster critical student voice and choice in learning. This will ultimately better prepare our students to interact and collaboratively work with others, both locally and globally, who may see the world from with a variety of distinct lenses. Today’s school leaders need more opportunities to closely examine the relevance of their curriculum processes to today’s



digital-age students, assess the varied needs of their changing demographics and new school communities, and authentically engage students in learning methods that will develop their career and life readiness skills in an ever increasingly complex 21<sup>st</sup> Century global society.

As 21<sup>st</sup> Century educators, we have the opportunity to provide forums of learning where all students can explore their identities, interests, inquiries about the world around them, develop team skills, apply technology, and gain valuable skills to thrive in the 21<sup>st</sup> Century workplace and life. Every citizen/student should have the right to be informed about environmental issues, not as an add-on to the core curriculum, but rather, as an integral part of their learning about key global trends which directly affect their lives. Every citizen/student should have the right and responsibility to be informed about matters of physical and mental health. Also, of utmost importance in educational social reform there need to be opportunities to reconnect poor and minority students to visions of themselves and their role(s) in society that are valued and respected. So many programs for such students assume that they will not need higher order thinking or workplace skills for high-level jobs (Berryman, 1988). It is vital to provide rich opportunities to expose students to multiple life options so that they can bond to the learning process and to society. In the future, children must enter a workforce in which they will be judged on their performance. They will be evaluated not only on their outcomes, but also on their collaboration, negotiation, planning, and organizational skills. By implementing PBL, we are preparing all students to meet the 21<sup>st</sup> Century demands with readiness and a repertoire of skills they can use successfully in a global context. This program evaluation will provide insight to the critical transitions all educators will

undergo if they want to provide each and every student the opportunity to be successful in academic endeavors and beyond.

As educators, we have a moral responsibility to our students. Therefore, we need to be receptive to new and dynamic processes that will allow these multifaceted and talented individuals to express themselves and contribute to their world of tomorrow (Brown & Moffett, 1999; Boyatzis & McKee, 2005). Also, with the aforementioned CCSS implementation and new assessments, which test more rigorous 21<sup>st</sup> Century skills, there is a new emphasis on increased student expectations for active participation in their learning and readiness for college and the workforce. In addition, the children of today are a technologically savvy generation of learners, who can utilize technology to discover many new learning venues. As educators, we need to recognize the need for developing effective socialization and communication skills for young adults and, more importantly, prepare our students to be effective contributors in a global society.

The predominant culture of many current learning environments includes an ever-changing definition of citizenship and high student performance accountability demands for school districts which are monitored at state and federal levels. As educators, we have a reliance on others' formulas for accountability of education, which is now even more widespread, considering the growing availability of information, data, and technology. Teachers and administrators, now more than ever, operate in an environment of transparent expectations for teaching and learning. As a result of these accountability pressures, principals are increasingly embracing opportunities to improve their school community's professionalism and support systems. In addition, in response to these realities, principals are becoming more savvy and proactive in high quality teacher

recruitment and retention efforts and more strategic with professional development investments. Evolving educational standards and a changing world require a re-examination of all school community resources. The culture of today's effective learning environments should include adaptive organizational readiness to constant change and increased opportunities for multiple and varied school community stakeholders to make connections to school goals and objectives.

The conditions of our current learning environments include leading with decreasing resources while also establishing venues for new ideas and open dialogue. This is necessary to facilitate a value-added approach to addressing school improvement in a coherent manner. As a result of the availability of information and technology mentioned earlier, educators are poised to establish more authentic and highly valid and reliable data-driven teaching and learning targets. An effective mechanism for monitoring and moving towards these targets is through collaborative focus and continuous dialogue opportunities during grade level discussions, whole faculty meetings, and district coherence opportunities. In addition, change leaders need to support and mentor new teachers with clear expectations for student learning, continuous feedback concerning instructional approaches, exemplars, and collaborative environments for growth.

The competencies of the current learning environment include increased communication through technology and promoting the use of formative data analysis to drive effective teaching and learning. A skillful organizational leader will be prepared to connect each of its members' individual personal goals to the organizational priorities (Collins, 2005). Examples of organizational priorities could include new specialization requirements for English as a Second Language (ESL), special education, and middle-

grade endorsements for teachers, as well as, venues in which all staff can seek and secure these credentials. Scheduling and organizing resources, including time and space, are also areas where many administrators can greatly influence and should create an infrastructure to promote critical ongoing collaboration among staff. Also, school resources such as; time and space utilization need to be re-examined to provide more conducive student-centered collaboration in academic content areas. In many cases, savvy school leaders structure their proactive environment for success by paying close attention to the informal networks, internal teacher leader groups, and their political community. School initiatives can thrive or be neglected to extinction if they do not make sense, are poorly implemented, or are perceived irrelevant and/or disconnected to the very people that need to be completely invested in order to deliver new instructional methodology effectively.

We should frame the context of learning for what is expected in the future workplace. Educational leaders need to help young adults achieve and succeed to their fullest potential with this vision in mind. This can be realized by helping young adults envision, develop, and nurture the skills needed to shape positive relationships and societal change. Technology can be utilized as a powerful tool for promoting effective communication, positive social networking, and improved productivity. As a result, educational leaders will have a leading role in developing global citizens who can think for themselves and have the tools needed to self-actualize, while also creating a new workforce fully equipped to meet the ever-changing needs of the global marketplace.

Today's optimal learning environments include adopting proactive roles in acquiring abundant resources needed to support school improvement and student success.

Moreover, all teachers will need to possess the skill sets, endorsements, and certifications necessary to address a variety of instructional specialties in order to better meet the unique needs of their students. In addition, they will need to develop the skills required to effectively use multiple data sources to identify both qualitative and quantitative areas of need and success. Specifically, we need to target research-based and effectively proven teaching strategies, administrative models, and community outreach programs that will assist us in closing the achievement gap for our Hispanic, and other diverse native language, English Language Learners (ELLs), African-American, refugee, and homeless populations.

We should also initiate proactive endeavors, which are critical and necessary, to enhance and improve outreach efforts for parental stakeholders and external school community agencies. We want to go beyond the informed parent model to an empowered parent model, and also from students as receivers of curriculum to students as designers of their own academic and social-emotional growth.

Leaders are ambitious first and foremost for the cause, the organization, the work – not themselves. As educators, I believe that this core value naturally flows from the work that we do, because educators have a huge influence on the next generation of humanity. Therefore, we need to develop productive and functional cultures and also grow the competencies we seek with those entrusted to educate our children. As such, educational leaders need to become astute in identifying teachers and educators who believe in themselves, have a genuine desire for social justice, have a high level of emotional intelligence, and have nurtured and grown themselves. These prospective

leaders will in turn select others to assist them in true organizational change with a high emphasis on student growth.

As educational leaders, we have many venues to set in motion the conditions necessary to facilitate success. Great organizations prosper through the promotion of multiple leadership stakeholders. It is our responsibility to cultivate and distribute leadership opportunities throughout the layers of our organizations in order to build a culture of advocacy, caring, and efficacy toward student achievement. In order to accomplish this, we should practice a transparency of core values that all members of the organization can visibly see and resonate with. As educators, who are committed to the successful education of the students that are entrusted to us, we also need to be receptive to new and dynamic instructional processes and varied school community perspectives and roles that will allow our multifaceted and talented students to authentically express themselves and contribute to their world of tomorrow.

As change agents, we have a duty to embrace and empower the communities that we serve to identify and address the many local and global issues our students face. The values around teaching, learning, and school decision making that should drive our actions need to include an unequivocal belief that all children can and *will* learn to take action toward solving problems that matter to them. This belief is of critical importance since it ultimately impacts every behavior that surrounds our instructional practices.

#### Rationale

I chose to evaluate the first Illinois 21<sup>st</sup> Century Consortium MindQuest21 implementation in the Progressive School District 21 (D21) because it integrates professional development with real-world problem solving skills utilizing a PBL

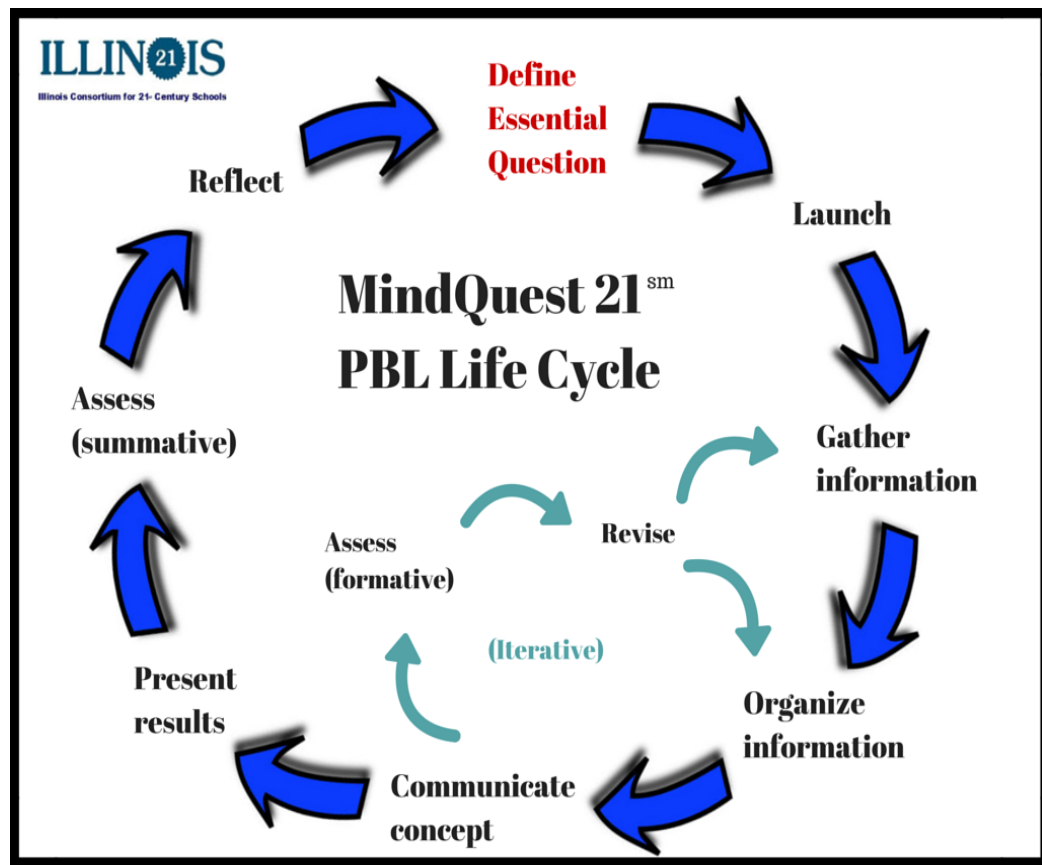
approach, integrated awareness of CCSS, multiple strategies for successful authentic formative assessments, and 21<sup>st</sup> Century skill development. This program encourages teachers to collaboratively develop and assist students to create meaning in what they learn by working with technology. The diversity of this district, with an increasing Hispanic enrollment population, will be an exciting environment to study the effects of PBL professional development implementation and the unfolding of new pedagogical practices within the involved classrooms. This district prides itself on high expectations for the entire school community and has been very responsive and adaptive to the growing demands of its dynamic demographics. The involvement of D21 in MindQuest21 PBL professional development will allow for an examination of teacher receptivity, self-directed commitment, and ability to work with diverse populations of students which will facilitate ubiquitous accessibility and necessary 21<sup>st</sup> Century knowledge and career readiness.

The MindQuest21 PBL inquiry model implementation, promotes pedagogical best practices, the infusion of technology through professional development planning, and the preparation of classroom implementation units which align to the new CCSS, and 21<sup>st</sup> Century skills. The professional development includes a project-development process that guides participants as they develop strong technology skills and a road map for project-building they can emulate in their classrooms with their students. Modeling a PBL environment during professional development gives educators firsthand experience with the process of planning, working in a collaborative group with peers, and learning in a project-based setting. This allows them to experience the same successes, failures, and potential frustrations their students may encounter in this type of classroom environment.

## The MindQuest21 PBL Model

MindQuest21 provides an approach to planning and preparation for teaching and learning that applies a comprehensive project overview cycle to single or multidisciplinary content instruction (see Figure 1). This model provides teachers a process of unit design that integrates key elements that promote deeper planning and preparation, encourages authentic student voice and choice, fosters student relevant and real-world essential question development, stimulates 21<sup>st</sup> Century skills, addresses CCSS, and offers continuous formative and summative assessment opportunities throughout the process of learning to learn.

Figure 1.- The MindQuest21 PBL Life Cycle





## The MindQuest21 PBL Life Cycle Elements

As traditional instructional planning and methodology shifts to PBL teaching and learning approaches, teachers begin to make new decisions about how they design student learning experiences. A PBL approach shifts not only teacher practice but also students' learning roles and responsibilities from passive receivers to active developers of their own learning. The MindQuest21 model for project-based learning follows a cycle of elements which promote both teacher and student co-development of learning. Each element is designed to promote student application of both process 21<sup>st</sup> Century skills and content standards in a more engaging and authentic approach. Every project begins with a "Big Idea". The MindQuest21 PBL "Big Idea" is the initial step in planning an overall project, and defines the overall framework for the project. This is where teachers consider targeted standards, student relevance and interest, 21<sup>st</sup> Century learning goals, and available resources. Below are the PBL Life cycle elements, and their descriptions, which comprise a fully developed project.

### *Element #1 – Define Essential Question*

In MindQuest21 PBL essential questions are encouraged and come from a variety of stakeholder voices. When teachers begin planning, designing, and implementing PBL this question identification becomes critical for inclusion of; targeted standards, student interest, 21<sup>st</sup> Century learning goals, and available resources. Essential questions, generally derived from a 'Big Idea', are open-ended, broad enough to require true inquiry, narrow enough that the project is manageable, fit within the timeframe allotted, and provide opportunities to develop further guiding questions to structure a formative assessment process.

### *Element #2 – Launch*

An entry event or launch for PBL is the initial activity that engages students' attention and stimulates their interest to learn and explore further. The design of these launch activities focus on a desired reaction or emotional connection from students. Good launch activities keep curiosity active and alive throughout the project cycle and it is at this element stage that student teams should be formed and specific individual and team roles assigned. Initially, these new student responsibility shifts need to be explicitly taught but eventually become a natural part of a collaborative classroom learning culture.

### *Element #3 – Gather Information*

The development of guiding questions, mentioned in the Define Essential Question element, should derive directly from a consensus of what students want to learn more about, what students need to know more about, and are contributing to the project identified standards, content, and development of 21<sup>st</sup> Century skills. The gather information element of the PBL Cycle is where a variety of predefined rubrics are introduced, research is assigned, graphic organizers are encouraged, and reflection opportunities are afforded to the students as they collect, assemble, and begin making sense of their sources whether they originate from past experiences or new information. Effective PBL teachers also redesign the configuration of their classroom environment conducive to optimal student small group planning and collaboration.

### *Element #4 – Organize Information*

This is where students begin making sense of the gathered information. They analyze data, synthesize information, make connections, and ultimately develop new understandings, theories, concepts or hypotheses as part of their learning process. An

effective PBL teacher guides students' data collection to deepen learning through relevant feedback, based on predetermined rubrics, to answer the guiding question(s), the essential question, and/or the big idea. Teachers develop skills of facilitators in helping students sort and validate their data from multiple perspectives.

#### *Element #5 – Communicate Concept*

Students are now ready to design and communicate their learning, as individuals or in teams, through presentation experiences. Students are encouraged to practice presentations with their peers and receive objective and targeted feedback intended to improve their first draft products. The intent in PBL is to formatively guide students through assessments of their learning to promote growth. The critique and feedback processes need to be explicitly taught for maximum effectiveness, objectivity, and to build a respectful and collaborative classroom community.

#### *Element #6 – Assess (Formative)*

MindQuest21 PBL encourages formative assessment opportunities throughout the project life cycle. This is particularly important for differentiation of distinct skills and content learning goals of varied students. Formative assessments are used throughout the learning process to allow teachers and students to gauge student understanding and to evaluate where additional instruction, practice, and revision are needed in order to maximize student learning and understanding. Formative assessments take many forms, including teacher observation, Socratic questioning, Critical Friends reviews, gallery walks, short quizzes, student self-assessment, student reflection, and peer assessment. Students should be assessed on both content and 21<sup>st</sup> Century skills. The rubric(s) being

used should be presented before starting work, so that the students have a clear and complete understanding of how they will be assessed.

#### *Element #7 – Revise*

Whenever possible, students should be given multiple opportunities to revise their work and move increasingly closer to the highest levels of the rubric(s). Each time a revision is completed, the work should be assessed again, so that the student and teacher can both gauge the progress the student is making. By conducting this iterative process, and providing "kind, specific, helpful" feedback, teachers support students in developing a growth mindset and the conviction that they can improve their abilities through dedication and hard work. It also promotes the idea that failure is not only okay, but expected.

#### *Element #8 – Present Results*

This is the step in the PBL life cycle where students show off their work. Whenever possible, this also includes an outside audience - parents, other students, community members, and/or experts in the topic(s) areas. Inviting in a larger and broader audience raises a sense of authenticity and relevance to the project, and inspires students to do their best work. If conducting a brick-and-mortar event, ask the students to take charge of the event - planning, inviting, greeting, presenting. The more responsibility they are given, the more ownership they will take for the outcome, and the more pride they will have in their end products. Additionally, ask the audience to participate in the assessment process, as this also heightens the students' sense of the authenticity and importance of their work. Also consider using venues powered by technology, such as websites, YouTube, Twitter, and other media platforms. This provides an easy, and often,

effective way to broaden the audience and receive immediate feedback. Once the students ask an audience for feedback, they will most likely receive insightful and thoughtful responses from people who care about their learning, appreciate their innovative and constructive ideas, and welcome new diverse discoveries on the topic.

#### *Element #9 – Assess (Summative)*

Summative assessments are conducted periodically to determine what, at that particular point in time, students do and do not know. They are typically used as an accountability measure for determining grades and/or for school/district assessment. Common examples are end-of-unit tests and standardized tests. In a PBL environment, summative assessments are more often integrated into the project itself. Although there may be formal tests for specific content knowledge, emphasis is placed on the end product and the student presentation of work. Just as in the formative assessment step, summative assessments should evaluate both content and 21<sup>st</sup> Century skills. The rubric(s) being used can be identical for those used in the formative step although can also integrate more rigorous expectations. The summative assessment is commonly used to determine the final score/grade for the project. Additionally student growth can be measured based on the difference between the scores from the first formative assessment to the summative result.

#### *Element # 10 – Reflect*

Reflection is a critical part of the PBL life cycle that is often overlooked. Reflection takes place on multiple levels. Students continuously reflect on their own work, and that of their teammates. Students deepen their metacognitive skills when they are given the choice to reflect on the project as a whole, identify particular elements that

worked well, those that did not, and solicit ideas for improvement. Teachers should also reflect on the project, documenting their perspective on successes, failures, and ways the project(s) could be enriched. In addition, teachers should request feedback from their colleagues and administrators, by conducting recurring project(s) tuning activities, using the Critical Friends protocol or any other collaborative process conducive to productive dialogue and practical project development. The ultimate objective is continuous project improvement and sustainability, deeper student learning, and improved teaching.

### MindQuest21 PBL Life Cycle Summary

The MindQuest21 PBL Life Cycle promotes new approaches to deeper planning, curriculum construction rather than delivery from a textbook, frequent and sustained teacher collaboration and communication, resource scheduling, student empowerment, parent communication, and high administrative support. Collaborative opportunities and time to plan, design, implement, assess, and reflect on projects are all essential components for this instructional model to be effective. Initially, teachers may work on individual projects but as the school culture embraces more authentic and student-driven projects, which are interdisciplinary, standards based, culturally responsive, and based on real-world issues, traditional school structures also need to shift to promote a more supportive environment.

### Goals

This evaluation will measure how the fidelity of classroom implementation, post MindQuest21 PBL professional development, is consistent with initial volunteer teacher professional development participation and their self-perception of confidence in specific implementation readiness categories. As many districts pursue to improve their high

quality teacher practices, D21 has promoted independent individual staff development endeavors, as noted in the number of staff with master's degrees, as well as targeting and funding specific best practices professional development objectives which are proactive and responsive to identified data analyses needs of their measured school community goals and objectives. Another indicator, or area of interest, will be the percentage of teachers who conclude professional development and also implementation of PBL unit(s) in their classroom or work assignment. I will examine artifacts of implementation evidence and consistency with commitment statements for implementation.

Given the identified and emphasized professional development content, which promotes high rigor expectations for collaborative classroom project plans (integrated 21<sup>st</sup> Century skills, CCSS, high effect strategies, and the use of technology); will the implementation sustain criteria required for high quality projects?

The formal follow-up collaborative teacher meetings for the 2012-2013 academic school year were scheduled for and dedicated by the district to be: September 12<sup>th</sup> and/or 19<sup>th</sup>, October 10<sup>th</sup> and/or 13<sup>th</sup>, December 5<sup>th</sup> and/or 12<sup>th</sup>, and April 10<sup>th</sup> and 17<sup>th</sup> (see Appendix A) The teacher participation sign-ups for the days in September, October, and December determined further development and sustainment support for three or six follow-up sessions. Participants were encouraged to devote at least one planning period every two weeks to attend to project planning and review in their grade level teams. In April, one day was reserved for a teacher gallery walk and celebration of teacher-facilitated student work. The second day was reserved for a meeting with the administrative leadership team and school community leadership to discuss next steps and the final program evaluation results dissemination timeline. Where applicable,

technology was infused throughout the PBL implementation, which was also a high district priority. A PBL video library was planned to capture the units of study for further teacher resource support during and post program implementation.

Teachers had opportunities to formatively present and share their creative, innovative, technology infused projects aligned to the CCSS, and research-based instructional best practices. These presentations could ultimately be peer-assessed toward the development of a local and web-based library of exemplar units of study. The collection of these units could also be shared with other teachers within their school and district or in other institutions that are also shifting and preparing for a PBL learning environment. A successful PBL implementation largely depends on teachers and administrators who collaborate and support the process of pedagogical change. PBL implementation requires another look at the effective and efficient use of school resources, a well-defined theory of action based on data analysis, high student expectations, and frequent discussions around current assessment processes and their validity and reliability for measuring new ways of teaching and learning.

#### Research Question

What drives this program evaluation is the examination of a professional development model designed to promote pedagogical shifts in teachers' instructional approaches to meet the needs of new student populations.

The primary research question for this study is "Is MindQuest21, a professional development methodology, an effective model to change a sample of D21 teachers' pedagogy from traditional to project-based learning approaches?"



Related guiding questions will build a foundation for the answer to this primary question. The related questions will explore:

1. How has the professional development experience shaped teacher attitudes towards readiness for PBL instructional designs?
2. How has the use of PBL helped teachers integrate 21<sup>st</sup> Century skills, CCSS, and technology tools into lesson planning design, delivery, and assessment?
3. What were teachers' perceptions of how students benefited from project-based learning?

## CHAPTER TWO: REVIEW OF LITERATURE

### Introduction

This study focuses on a process of an instructional delivery shift toward PBL. I am examining the effect of MindQuest21, a professional development model for PBL, with a sample group of teachers in western Cook County, Illinois. One of the many reasons this topic intrigued me is that this approach to instruction empowers teachers and students to greatly impact their curriculum. I have worked as an educational school leader for over twenty years and have been privileged to have visited and observed hundreds of elementary school classrooms in learning walk settings. On a mission for continuous school improvement, the lens from which I examined pedagogy was one of past consumer, present supporter, and future advocate.

I begin with 21<sup>st</sup> Century educational goals because we are living in very dynamic times. Schools today face rapid change and constant accountability. The political landscape of education is responding to a globally competitive reality. Other nations are surpassing us in the area of educational reform and college and career readiness for its citizenry. Their investments and actions are focused and in the best interest of their current and future citizenry, in terms of preparedness to work and live in the 21<sup>st</sup> Century. I refer to new work demands because of the apparent lack of clear communication from the world of work sector to the academic hierarchies of educational decision-making in the U.S. We need to establish a sense of urgency around this disconnection in order to be much more effective and proactive in advocating for educational change at all levels. I also refer our changing national demographic because it is imperative to acknowledge a changing society where the very existence of the educational institution is to serve and

develop its consumers, however dynamic and diverse they become. It is the challenge of educators in the 21<sup>st</sup> Century to be responsive and accountable for the success of *all* its new citizens. Examples of other successful global models of education are cited to examine their process and progress of change and advocacy for educational reform. Countries where similar challenges are being faced and include dynamic diversity, high poverty, and economic distress, have managed to restructure priorities, redirect resources, redefine goals and objectives, and invest great amounts of energy into its citizens' future.

The U.S., in contrast, has been continuing the same teach and test pathway almost oblivious to other nations' proactive efforts for educational reform at the classroom level. I highlight new student populations in our schools as a separate entry from the changing national demographic because of the direct and immediate impact this subgroup of children, families, and new communities are bringing to American education and the growing evidence that they are now the new America. These new consumers are vividly experiencing, new environments, new relationships, new technologies, and in many cases, continued perceived challenges to traditional educational settings. Traditional is safe, it's familiar, it's comfortable, but it's not working for the majority of our students. We need to explore new instructional models, new classroom approaches, and new school designs. We should embrace the diversity of our new school community profiles across the country, gain new insights, promote innovative ideas, encourage multiple perspectives, and develop synergy from our unique and rich multicultural landscape.

I briefly discuss testing and accountability because it is an educational accountability reality. Testing drives content, content drives the delivery plan of instruction and selection of methodology and resources, methodology and resources drive

instructional grouping and differentiation practices, which all drive generations of students' academic identity, self-worth, socio-emotional development, formative and summative results, and the cycle continues. A reference to teacher roles and responsibilities is included to get at the heart transformative pedagogical change. At the classroom level and in teacher collaboration settings is where real instructional change happens. The last section is focused on PBL, who is doing it, what it means, why do it?

Although I approached this research process within a local context, this research has implications to a larger context of U.S. educational best practices and global competitiveness. I outline the literature below from a broad context to a specific district instructional implementation in order to scaffold and tier a clear understanding of a wider perspective of necessary instructional paradigms shifts and possible replications in other U.S. classrooms.

### 21<sup>st</sup> Century Educational Goals

The vision or object of our quest as educational leaders should be to ensure that our children can contribute as productive and actualized adults in a global and technologically sophisticated society. The future impact on instruction and student growth will be a greater connection to the skills and concepts our children will need in their future endeavors as adults. We need to consider the expected demands and possibilities our descendants will have in a world where technology and information and are ubiquitous and easily accessible. Citizens of the future will have efficiencies beyond our imagination. Social equity and responsibility will be unavoidable. If our children are to succeed in this world, we need to educate them to be problem-solvers, environmentally conscious citizens, have the ability to form deductions and inductions related to

phenomena of circumstances that surround them, synthesize varied amounts of information, and appreciate the simple pleasures of human interaction and of life balance. We cannot continue to affect our own versions of what we think our children should know and learn. Rather, we need to listen to new voices and be open to how our students are valuing and profiting from our current systems. This will allow them an active role in a change process that is truly conscious and aware of the changing world that they will inherit. The world has flattened in many ways. Not only are we experiencing greater ease for efficient communication and connection across the globe, which has given our corporate sector more options for outsourcing work, jobs, and product development, but also within our own national employment structures, economic competitiveness has driven new designs, structures, and work-readiness expectations from our students.

Tony Wagner describes this as the *global achievement gap*, where he identifies a new gap between what even our best suburban, urban, and rural public schools are teaching and testing versus what all students will need to succeed as learners, workers, and citizens in today's global knowledge economy. The way work is organized now is lots of networks of cross-functional teams that work together on specific projects (Wagner, 2008). Clearly, this work-world reality should create a sense of urgency among educational leaders, policy makers, state superintendents, and federal educational agencies to closely examine the academic experiences our students receive. The discussions are taking place at all levels. The standards are being re-visited. Assessments are being formed. Exemplar 21<sup>st</sup> Century sites across the country are being highlighted. Although the CCSS contain higher student expectations, they also need to be followed by effective, efficient, and well-designed teacher professional development

programs which encourage and provide venues for rigorous teacher conversations and collaboration scenarios around student success, optimal teaching and learning school cultures and climates, and purposeful professional learning communities. These invaluable change levers of communication and connection also provide the critical opportunities for deep discourse regarding inter-disciplinary curriculum designs, pacing and diagnoses of authentic assessments, flexible scheduling, and other relevant teacher empowered conversations which advocate and could develop into highly effective instructional multiple-delivery systems. These actions also facilitate the process of perceived and actual changing roles and responsibilities within our classrooms, outside our classrooms and, into our ever-expanding communities. “A better understanding of how educators are prepared for their profession and how they learn and interact with colleagues in their work is a precondition for transforming public education.” (Wagner, 2008, p.132).

#### New Work Demands

New skills are needed in a knowledge economy. Knowledge is expanding at a rapid pace. In 2002 new information tripled compared to 1999 and has since doubled every two years (Varian & Lyman 2003). Therefore students of today no longer need to memorize and transmit pieces of information, but rather students need to know how to access information wisely and learn for themselves so they can think critically and be savvy about the dynamics of today’s changing world and use knowledge strategically to manage new workplace demands and society. Working, learning, and thriving in the 21<sup>st</sup> Century will also require that students effectively communicate, think, inquire, reason, adapt, collaborate, and problem-solve.

Our schools need to be the catalyst of economic survival for our country. The 21<sup>st</sup> Century has brought rapid exponential change to our global society. According to Wagner, 2008, xxvi “To better understand how all of our schools must adapt to new realities, we need to examine three fundamental transformations that have taken place in a very short time:

- the rapid evolution of the new global “knowledge economy” with profound effects on the world of work—all work.
- the sudden and dramatic shifts from information that is limited in terms of amount and availability to information characterized by flux and glut.
- the increasing impact of media and technology on how young people learn and relate to the world—and to each other.”

These fundamental transformations saturate every classroom dynamic in today’s schools. Effective teachers need to be as, if not more, comfortable and highly technology literate as the students they teach. They need to more in touch and informed of work-place expectations in order to modify, enhance, update, and advocate for new curriculum and assessment processes. Teachers need time to collaborate and invest valuable professional hours to curriculum mapping new life-long skills, integrating interest-based content, that allow students to learn and do, grade by grade, and in critical socio-emotional milestones of their academic experience.

## Our Changing National Demographics

All across our nation, American schools and classrooms are registering and teaching one of the largest influxes of immigrant students since the beginning of the 20<sup>th</sup> Century. About a million new immigrants are making the U.S. their home each year (Martin & Midgley, 2006). The U.S. census (2007) projected that ethnic minorities would increase from one-third of the nation's population in 2006 to 50 percent in 2042 (Roberts, 2008). It is because of this fact that our schools will need to re-examine the quality of education we provide, not only to the privileged few but, to our ever increasing minority populations and changing demographics if we expect to be globally competitive. We can no longer continue to neglect and bury our heads in the sand regarding the educational experiences of the inevitable majority of our students across the country, for their education and outcomes are the outcomes of us as a nation. No society can thrive in a technological, knowledge-based economy by depriving large segments of its population of learning (Darling-Hammond, 2010, p.328).

## Successful Global Education Systems

In many schools across the globe creative and innovative processes are being implemented that take into account these new workplace demands (Darling-Hammond, 2010, p. 5). For example, in Singapore, 80% of children and families live in public housing developments but they scored first in the world in both mathematics and science on TIMSS (Trends in International Mathematics and Science Study) assessments in 2003. Singapore values its human capital. In 1997 Goh Chok Tong, the former prime minister adopted a system-wide reform called "Thinking Schools, Learning Nation." The ministry of Education explained the initiative as: a nation of thinking and committed citizens



capable of meeting the challenges of the future, and an education system geared to the needs of the 21<sup>st</sup> Century (Singapore Ministry of Education, 2007).

As Ng Pak Tee from Singapore's National Institute of Education explains, "Syllabi, examinations and university admission criteria were changed to encourage thinking out of the box and risk-taking. Students are now more engaged in project work and higher order thinking questions to encourage creativity, independent, and inter-dependent learning." (Ng, P.T. 2008).

Another successful educational system example would be Finland which has undergone an educational transformation. Finland boasts investments in their 21<sup>st</sup> Century school buildings, technology infrastructure, calm children, and highly educated teachers. Teachers in Finland receive 2 to 3 years of high quality graduate-level preparation completely at state expense. In addition, Finland has invested in many changes to curriculum and assessments designed to ensure access to a "thinking curriculum" for all students (Darling-Hammond, 2010, p. 167). Finland has, contrary to popular belief, also experienced dramatically increasing social and ethnic diversity. In some Finnish schools the total percentage of non-Finnish speakers is close to 50%. The Finns have worked systematically over 35 years to make sure that competent professionals who can craft the best learning conditions for all students are in all schools (Sahlberg, 2009).

Still another global example of a country which has turned around their educational system is South Korea. This country has made major investments in teaching and learning. Teachers are highly qualified in Korea: 100% of them have completed teacher education and a set of written and performance tests to attain certification

(Darling-Hammond, 2010, p.179). In the area of curriculum development Korea practices a cyclical 5 -10 year formal refinement process to continuously review the rigor and relevance of their educational system. Curriculum reforms have focused on reducing the total number of instructional hours, along with the amount of subject-matter content students need to cover each year, minimizing redundancies and increasing opportunities for in-depth study, the proportion of optional activities in school that encourage students' self-directed learning, students' independent study skills, and other creative activities (Lee, 2005).

Although there are some districts and/or schools throughout the U.S. that are also making strides in these critical areas, they are not the norm. Singapore, for example, is only one of many nations which are reviewing the importance of high quality educational systems for all. Also, many nations in Asia and Europe are providing and investing resources to build better infrastructures and forward thinking educational programs than those found in the majority of U.S. schools. With some exceptions in a few states, the U.S. is failing to equitably invest in sound, sustainable, and innovative new thinking regarding school redesign to support and advocate for a 21<sup>st</sup> Century approach.

#### The U.S. Contrast

In the progressive educational examples cited above from distinct countries around the globe, some common denominators, at the core of change and re-examination for educational transformation are; depth of instructional design, formative and authentic assessments, attention to equitable instructional materials, and highly-qualified teachers. These phenomenal student achievement gains and successes have been accomplished with a tremendous sense of overall public well-being and political advocacy for funding

and with a large degree of school level curricular autonomy. Can we learn from these reforms? Are they possible in U.S. schools?

The U.S. has the highest poverty rates for children among industrialized nations and provides fewer social supports for their students' well-being and fewer resources for their education (DeNavas-Walt, C., Proctor, B.D., & Lee, C. H. (2005), U.S. Census Bureau (2006). In addition, in the U.S. approximately 30 to 40% of children enter kindergarten without the social and emotional skills and language experiences necessary to be successful in school (Zigler, Gilliam, and Jones, 2006). Nearly two-thirds of African American and Hispanic students attend schools where most of them are eligible for free or reduced lunch. This concentration of poverty has an independent influence on student achievement, beyond the individual students' own socioeconomic status, confirming the 1966 Coleman Report that "the social composition" of a school's student body is more highly related to student achievement, independent of the student's own social background, than is any school factor (Coleman, 1966).

According to the Center for Public Education, 2012:

- Hispanics are the youngest population. More than one-third of all Hispanics are younger than 18. In 2010, only 19 percent of the Hispanic population was 45 or older (see Table 1.).
- Using 2005 figures, the Population Reference Bureau estimates that about 45 percent of children younger than 5 are minorities.
- In 2008, there were 49.3 million elementary and high school age children (5-17 year olds). About 1 in 10 students attended private school in 2008, a ratio that has remained fairly consistent since the 1970s.

- Between 2000 and 2008, 13 states saw increases in enrollment in grades 1 through 12. During the same period, 37 states experienced decreases, although only 16 saw decreases that were statistically significant.
- In 2010, 21.6 percent of children under age 18 lived in poverty. Notably, in the 10 states with the highest poverty rate for school-age children, the poverty rate is even higher for babies and children 0-4, the children who are today school age (see Table 2.).
- The percentage of births to unmarried mothers has nearly doubled since 1990, up from 26.6 that year to 40.6 percent in 2008.
- In 2009, 23 percent of U.S. students had at least one foreign-born parent; this includes the 5 percent who were foreign born themselves and the 18 percent who were born here with at least one foreign-born parent.
- Among the foreign born in 2009, 53 percent were born in Latin America, 27 percent in Asia, 13 percent in Europe, and 7 percent in other regions of the world.
- The top ten states with populations 5 and older who speak a language other English comprise over twenty percent of their population (see Table 4.)

Table 1. – Percent of Population by Selected Age Groups, 2000

Age:	Under 18	18-24	25-44	45-64	65+	Median Age
Total U.S. Population	25.7	9.6	30.2	22.0	12.4	35.0
Asian	24.1	11.1	36.0	21.0	7.8	33.0
Black	31.4	11.0	30.9	18.6	8.1	30.0
Hispanic	35.0	13.4	33.0	13.7	4.9	26.0
Non-Hispanic White	22.6	8.6	29.4	24.4	15.0	39.0
Source: U.S. Census Bureau “Age 2000,” Census 2000 Brief, October 2001						

Table 2. – The 10 States with the Highest Child Poverty Rates

Rank	State	Percent in Poverty	
		Ages 0-4	Ages 5-17
1	Mississippi	37.5	30.2
2	Louisiana	32.9	25.0
3	New Mexico	32.0	26.7
4	Arkansas	32.0	24.9
5	Alabama	31.3	25.6
6	South Carolina	31.2	23.6
7	Kentucky	31.1	23.7
8	West Virginia	30.4	23.4
9	District of Columbia	30.2	30.9
10	Tennessee	30.1	23.9
Source: U.S. Census, Small Area Income and Poverty Program Estimates for 2010			

Concentrated poverty typically shapes schools. These schools generally have less qualified teachers, fewer resources, and lower levels of peer group support and competition. These factors combined tend to create a further learning opportunity gap for students who attend high percentages of poverty and minority schools. Changing demographic phenomena are occurring across many states in our country. Illinois suburbs in the Chicago area, for example, are experiencing migrations of many new students of color living within their attendance areas. Many Chicago metropolitan area residents are feeling the economic stress of living in a very gentrifying and changing Chicago. Although for white students in suburban Chicago school has become a much more diverse place in the last 20 years, Chicago schools have seen dramatic segregation of Hispanic and African American students. According to a WBEZ report “Race Out Loud”, June, 2012 the number of segregated schools in the City of Chicago have increased, which is a direct factor of the population demographics and the neighborhood segregation that also exists. This is an unprecedented shift of population of children of color moving to the surrounding suburbs.

Table 3.

Chicago Public Schools with High Percentages of Minority Students  
(20 years ago and today)

	20 years ago		Today
	1989-90		2009-10
Number of Chicagoland schools that are:			
At least 90% Black	309		343
At least 70% Black	380		451
At least 50% Black	466		534
At least 90% Hispanic	27		114
At least 70% Hispanic	83		290
At least 50% Hispanic	142		449
At least 90% White	562		103
At least 70% White	1001		590
At least 50% White	1217		955
At least 90% Asian	0		0
At least 70% Asian	0		1
At least 50% Asian	0		3
"No Majority" (no racial group has more than 50 percent)	164		346
Total number of schools	1990		2287

Educators are now seeking new approaches to instruction and teaching methods to meet the needs of a rapidly changing diverse student body. This is in the context of an also dramatically changing technological society and digital native students who perceive

their world in much different ways and are not motivated by lecture based traditional pedagogy.

Many African-American and Hispanic families have had to move outward from Chicago toward southern and western townships and or nearby suburban areas that are experiencing great numbers of new enrollments of diverse populations.

This has led to many school board and district conversations around curriculum, staffing, new frameworks for academic and language acquisition, professional development priorities designed for meeting the needs of a more diverse population and the inclusion of African American, Hispanic, and ELLs within the traditional White middle-class student body. Psychologist Robert Glaser has argued that schools must shift from a selective mode – “characterized by minimal variation in the conditions for learning” in which a narrow range of instructional options and limited a number of ways to succeed are available” – to an adaptive mode in which “the educational environment can provide for a range of opportunities for success.” Modes of teaching are adjusted to individuals’ backgrounds, talents, interests, and the nature of past performance. (Glaser 1990).

### New Student Populations

For new immigrant students, usually also ELLs, being active participants in classes with native English language speakers is critical to mastering a new language, becoming 21<sup>st</sup> Century learners, and ultimately prepared for college and career readiness. Depending on the school bilingual transition process these students undergo, if well designed for strategic inclusion into mainstreamed classes, they generally do well and academically benefit, particularly with cooperative grouping assignments, peer

assessments, and project-based learning curriculum designs. There are many schools of thought who promote native language academic delivery models which, if well implemented, can also promote students with the empowerment of speaking, reading and, writing in two languages. However, there are also, due to teacher shortages in native language skills and appropriate certifications, many unsuccessful bilingual programs in which students get an isolated and lower expectation academic experience. Some of these students do not transition well into the mainstream English classrooms and end up frustrated and lacking the skills necessary to succeed and sustain the general curriculum at a high competence level to compete with their peers. This inequity is also occurring at the high school level where many ELL students are segregated into remedial classes for multiple years and then find out that they lack the required coursework for graduation and college.

Table 4. – Top Ten States in which Persons Five and Older Speak a Language Other than English at Home

Rank	State	Percent of State's Total Population
1	California	43
2	New Mexico	36
3	Texas	34
4	New York	29
5	Arizona	29
6	New Jersey	28
7	Nevada	27
8	Florida	26
9	Hawaii	26
10	Illinois	22
Source: U.S. Census Bureau. "Language Use in the United States: 2007" American Community Survey Reports, April 2010		

Project-Based Learning offers new approaches and promise as an instructional methodology that affords authentic learning tasks grounded in the personal interests of learners. Although there have been many previous studies regarding results of learning



gains, motivations, and teacher experiences, limited research has presented student perspectives in PBL. With specific regard to English Language Learners, there are many nuances that have yet to be thoroughly examined. With the growing number of diverse language students entering our school districts nationwide, it is imperative that we understand the cultural and multi-ethnic perspectives these students bring to the classroom environment.

ELL students benefit greatly with PBL curriculum designs which should begin as early as elementary school since they gradually become full participants in a process of peer to peer acceptance. This is of utmost importance since for too long ELL populations have experienced a segregated curriculum. In most states, district policy determines their destiny. When they enter school they are given a Home Language Survey (HLS) which immediately places them in a bilingual education track. This begins their educational journey, the quality of academic rigor they experience and, in many cases, the teacher preparation quality they receive. By the time they exit and mainstream into the general curriculum, they've already been made to feel separate and unequal.

Specific to students of Hispanic background, culturally, this subgroup's home environment has traditionally trusted and highly respected the institution of "school". Their home environments vary greatly due to generational, socio-economic, and varied language proficiency factors. All too often U.S. educators assume native language literacy although these native Spanish speakers may be only "surface" conversational. They lack true literacy for reading and writing in their own language. Usually these students end up half way in between English and Spanish mastery. Their parents may or may not have the ability to assist them in either language curriculum. Therefore, the

curriculum designs they experience in their classrooms are imperative for their learning development. PBL implementation practices allow for continuous collaboration and problem-solving alongside English literate peers, which dramatically increases their repertoire of vocabulary, higher expectations, diverse perspectives surrounding academic content, and also provides a venue for purposeful teamwork projects and peer acceptance which is critical to their identity development in a new environment.

### Testing, Testing

Having been an educator for over twenty years, I have applied, supported, and monitored many teaching and learning and “best practices” expected by state and federal policies. An area that has always intrigued me is the inequity of supports for many of these mandated practices, particularly in the area of assessments and measuring schools’ progress. These are prevalent in many top heavy initiatives that ultimately trickle down to students as multiple choice tests designed to determine how many students can get the right answers rather than measuring what students can do with what they’ve learned. We need to begin to develop assessments where students can apply and characterize what they’ve learned and can also demonstrate and present the significance and implications of their cognitive dissonance, societal contribution, and personal growth.

Since the 1980’s, a growing number of states began to use tests as the basis for grade promotion and graduation decisions. By 2009, 25 states serving more than two-thirds of all U.S. students had exit exams determining student graduation in place or planned (Center on Educational Policy, 2004). One longitudinal study done by The Chicago Consortium for School Research found that, although some students’ scores improved in response to a high-stakes testing policy tied to promotion, the scores of the

20,000 low-scoring students who were retained in grade actually declined relative to those of similarly achieving students who had not been retained, and their dropout rates increased substantially (Roderick, Bryk, Jacob, Easton & Allensworth, 1999).

Perhaps we need to look more closely into our school assessment systems. With the changing demographic landscape of our country we cannot continue to rely on single source summative assessments, with a few formative assessments administered throughout the school year. Unless we change the way we test, we cannot easily change the way we teach. Students of today are living a different set of values, career outlooks, motivations for their future, self-identities, and how they connect and communicate with others. Schools need to be in close touch with what is relevant in their students' lives.

The students walking through our schools today live a new generation of highly stimulated environments. Their use of the Internet greatly influences how and what they learn, therefore, it is imperative that we hone in on their interests as a motivation for learning how to learn. As a maturing cohort of educators we need to understand our student's generational drives. They are more comfortable as interactive producers than isolated consumers of information. In a school setting, young people need to be facilitated through effective methods of analyzing and interpreting new media. They also need to be taught the art and science of information discernment and the moral implications and responsibility of their work using new technology. The increasing use of Web 2.0 Internet technology, which many of our students already use and experience as part of their daily lives, has the potential to dramatically enhance collaborative PBL learning management for teachers and more importantly increase student engagement and motivation for new and exciting constructivist learning experiences.

## Teacher Professional Roles and Responsibilities

Nations which have dramatically improved their students' achievement, such as Singapore, Finland, Korea, and others, attribute much of their success to their focused investments in teacher preparation and development. The U.S. has lagged in this critical area. There are great teachers in some of our nation's communities, and also some strong professional development preparation programs, but they are scattered and in all too many cases have not been sustained. In contrast, high-achieving nations realize that without a comprehensive framework for developing strong teaching and professional learning communities, and new resources and research-driven initiatives to improve culture and climate in high-need schools, they are less effective than they otherwise could be.

In efforts to adapt to the redesigned CCSS and new correlated assessments, best practice schools and districts across the country have invested strategically and begun transformative instructional changes and targeted professional development to proactively examine, plan for, and collaboratively create units of study aligned to the expectations of new teaching and learning in a more complex world. We cannot continue to wonder if our teachers possess the knowledge of expected higher order thinking and deeper knowledge cognitive skills and curriculum necessary to prepare our students for 21<sup>st</sup> Century needs in college and the workplace.

Aside from U. S. national efforts being made to increase curriculum rigor through the CCSS, effective and efficient inter-disciplinary content delivery models, the use of technology infused in teaching and learning, and new pedagogical approaches such as project-based learning, inquiry learning, and real-world problem-based units of study, we

have much work to do with other factors around equitable educational programs across the country. This program evaluation focuses on the effect of PBL as an integral part of the transformation our schools should examine as a proactive instructional model addressing the core of our work - our classroom settings.

During my own experience as an educator, I have attended many different professional development programs relevant to either a component(s) of my roles and responsibilities and also as part of our state's continuous educator development accountability. The experiences varied in quality and relevance and, as an educator, I utilized and optimized the bits and pieces of content which I could integrate into the work of school improvement and the differentiated needs of our students. In other instances, I participated in multiple-day professional development experiences which were deeper in content and provided extended teaching and learning best practices beyond one-day events. These multiple day events were much more effective for my needs as an educator. Not only were they more explicit and useful in content and standards awareness but also hands-on approaches provided opportunities to develop experiential practice with peers, anticipate potential classroom environment changes, evaluate necessary collaboration structures, explore students' best interests, analyze possible classroom role transitions, discuss critical school community stakeholder awareness action steps, and collaboratively review needed changes to school and district procedures, schedules, organizational structures, and potential policy changes or adjustments.

A summary of experimental research found that short-term professional development experiences of 14 hours or less appear to have no effect on teachers' effectiveness, while a variety of well-designed content-specific learning opportunities

averaging about 49 hours over a 6 to 12 month period of time were associated with sizable gains: students of participating teachers gained about 21 percentile points more than other students on the achievement tests used to evaluate student learning (Yoon, 2007).

### Project-Based Learning

PBL is a model of instruction for creating independent thinkers and learners. Children solve real-world problems by designing their own inquiries, planning their learning, organizing their research, and implementing a multitude of learning strategies (Bell, 2010). An enriched learning project is a new model of instruction. It is a flexible, project-based learning model that enables teachers to enrich students' learning experiences by integrating standards-aligned content with 21<sup>st</sup> Century skills in a project framework (Bellanca, 2010). In addition to technology infused practices the enriched learning project also includes many research-based pedagogical best practices and instructional strategies to promote high achievement (Marzano, Pickering, & Pollock, 2001).

In PBL, children are constructing knowledge and building on their background knowledge. Children retain more information when they learn by doing. Dewey proposed that learning by doing has great benefit in shaping students' learning. High-quality experiences, as well as continuity of experiences, are paramount. PBL is an effective approach and is in line with Dewey's philosophies, to which many educators have ascribed for enriched learning (Dewey, 1938). In today's educational arena classrooms have the potential to be anywhere there are resources and appropriate learning

opportunities. Learning may involve written, spoken, graphic, or electronic texts and information.

The goal of project-based professional development is to create tasks and an environment as similar as possible to what participants will be expected to create in the classroom. In the same way that project work in the classroom requires an extended time frame, a project-based model for staff development requires multiple-day commitment. Participants gain first-hand knowledge of the learning process and the experience to create the same environment in their own classrooms. In some cases, with the technology resources they already possess, they may only need to be guided towards creative infusion within their lesson plan objectives for more efficient, engaging, and effective student learning.

Using end of unit projects is common in traditional schools. This emergence of inquiry-based learning in its iterations is giving a new emphasis to projects, performances and products as the focus of learning throughout units of study, rather than as add-ons. The distinction is that the inquiry projects, problem solving, investigations, explorations and experiments become the method for learning, not merely the final statement. In place of learning by doing in what might be dubbed the “rub off” effect of traditional projects, PBL experiences include structured learning from doing tasks and reflecting on the how and why. In these projects, teacher stimulated reflections help students think about what they learned so they may transfer their knowledge and skills to increasingly complex and difficult challenges in the curriculum as adroit problem solvers.

While inquiry-based learning at the end of unit projects such as dioramas, collages, mobiles, and flour and salt contour maps in the elementary grades; or science

projects, art shows, and gym demonstrations in the middle grades are a beginning, more robust inquiry learning has several distinctions. Inquiry-based learning units start with an ill-defined problem or driving essential question. Students then refine the question or problem into guiding questions and gather research that clarifies and enlightens the challenge or issue. Teams are formed, with distinct roles and responsibilities, to analyze data, evaluate ideas, deepen their understanding, and ultimately make judgments, deductions, or inductions. The students can work individually or in teams to decide how and what they are going to communicate about what they learned, get immediate peer feedback, revise if necessary, revisit their data, refine their project, prepare a presentation of their choice or genre to a relevant audience for additional feedback, and reflect on their overall learning experience.

As mentioned earlier, teachers may enrich PBL inquiries by intentionally including web 2.0 and other technology tools to gather data in the research phase, organize data in the “making sense” phase, and present new ideas or constructs in the communication phase. At times, teachers may have to include direct instruction of critical thinking and collaboration skills or with specific content skills called for in the CCSS. As a result, teachers are able to synthesize instruction of the 21<sup>st</sup> Century skills of critical and creative thinking and communication and collaboration (4Cs) as they design enriched projects aligned with the new standards. PBL is an innovative approach to teaching and learning that offers a multitude of engaging opportunities to teach relevant content, lifelong strategies, and integrated process skills critical for success in the 21<sup>st</sup> Century work world.



School districts across the U.S. are beginning to adopt curricula that follow a PBL approach with an emphasis on developing students' twenty-first Century skills. These system-wide changes place significant new demands that are not easily or quickly met. Indeed, a teacher's orientation toward teaching mathematics or science otherwise referred to as their "knowledge and beliefs about the purposes for teaching" mathematics and science (Abell & Bryan, 1997) can have a significant impact on how PBL is designed and implemented (Krajcik, Blumenfeld, Marx & Soloway, 1994). Therefore, when asked to make a change to their instructional practice, a teacher's existing orientation toward teaching acts as a filter for how they will adopt a new approach (Borko & Putman, 1996). Many studies have focused on examining the effects of a PBL approach on student learning (Geier, Blumenfeld, Marx, Krajcik, Fishman, Soloway & Clay-Chambers, 2008; Klymchuk, Zverkova, Gruenwald, & Soloway, 2008; Rivet & Krajcik, 2004, 2008; Wilhelm, Sherrod & Walters, 2008) or having teachers learn how to teach via PBL within the context of professional development settings (Krajcik et al; 1994 or Rosenfeld & Rosenfeld, 2006). However, research that illustrates teachers' initial experience with implementing PBL and their thoughts on how this approach aligns with their existing orientation toward teaching their discipline is scant.

### *High Tech High (HTH)*

There are strong efforts across the U.S. for PBL and new school designs. One such example is the High Tech High (HTH) network in San Diego, CA. High Tech Middle (HTM) is an example of a middle school where PBL has had a dramatic impact on student achievement and the campus environment. I visited the (HTM) school site in 2010. I had heard of the many highly effective teaching and learning practices, PBL

amongst the predominant teaching methods, and the exceptionally engaged student-driven curriculum and assessment designs. Serving a highly diverse population, HTM graduates go on to college at a rate of 99%, and the state test scores are among the highest in the country. The school edifice and surroundings were particularly modest from the outside. Students were coming in and out of the school in what I call a “relaxed west coast style”. Once I entered the main door it was clearly obvious that this was a uniquely personal community space. Although not everything was clean and in order, there was a sense of innovation, inventiveness, creativity, experimentation, and cultural freedom represented within the entire school environment. When I spoke to a young teacher she stated that PBL has been central to the success of HTM, a school founded on the principles of personalization, common intellectual mission, and adult-world connection. Teachers design projects to respond to the interests and needs of their students, explore the core concepts of their disciplines, and build on their own passions and strengths. I left there feeling that this was clearly a culture of high engagement and progressive practices. There are other examples throughout the U.S. of schools and communities striving to innovate, replicate, improve and/or reflect on transformative systems of change to new 21<sup>st</sup> Century school models.

### *The Met Network*

The Met Network, in Rhode Island, was implemented in 1996 by the Rhode Island Department of Education (RIDE) in partnership with other foundations and philanthropies. The Met has been noted for success in violent urban and diverse environments with a near 100% graduation rate. The Met’s Five Learning Goals represent specific intellectual and interpersonal skills in which students must demonstrate

mastery through projects and internships (Wagner, 2008). This represents a great connection to the new skills required for the real-world of work.

### *Deeper Learning Network*

There are other organizations like the Deeper Learning Network, funded by the Hewlett Foundation, which invests in non-profit organizations that promote policies or strategies for deeper learning in schools, build capacity and teacher practice online and in the classroom, fund research that promote deeper learning, and develop new and innovative models to increase access to deeper learning for all students. Also, New Tech Schools (NTS), a non-profit organization spreading across the country, with already over 100 schools in several states, promotes and facilitates transformative instructional designs using PBL and 21<sup>st</sup> Century skill development. NTS provides services and supports that enable schools to fundamentally re-imagine teaching and learning. PBL is at the heart of their instructional approach and the smart use of technology supports their innovative approach to instruction and culture.

### *New Tech High*

In a March 3, 2010 speech to the Association of American Publishers, U.S. Secretary of Education Arne Duncan pointed to Manor New Tech High School in Manor, Texas “as an example of a school making smart and strategic use of technology” and as “a model for reaching underserved youth.” Manor New Tech High School is one of the official Texas, Science, Technology, Engineering, and Mathematics (T-STEM) Academies of the Texas High School Project and also a NTS school. The student-to-computer ratio is one-on-one, which enables creative presentations, research, and communication. Students apply their knowledge through team projects, modeling real-

life work situations, job assignments, internships, peer reviews, and connections to community college, and career experiences.

In June of 2012, I had the pleasure of telephone conferencing with Mr. Steve Zipkes, the Manor New Tech High principal. Our discussion centered on their success with closing the achievement gap. His responses were candid and refreshing. He stated that the collaborative culture at all school levels was critical. “Every adult in the school is a leader”. The diverse student population is constantly encouraged and reassured of their potential for success. The school offers mini-lessons on a “need to know” basis. Student voices are loud in decision making; self-assessment and reflection. Since the students are so engaged in the relevant collaborative PBL units, they rarely have discipline issues. Manor Tech’s use of project-based learning instructional approaches offers engaging and collaborative opportunities for learning, the use of technology is integrated across the curriculum, and there is a school culture that is based on trust, respect, and responsibility.

In the examples above, PBL is a shared instructional practice that has become an integral part of many educational transformative endeavors. PBL is not the traditional “projects” we’ve seen in schools usually at the end of a unit in the form of an artifact, created by mass replication, or a presentation. In the traditional model a project manifests as an outcome to summatively assess, via a rubric or other measurable indicators, students’ understanding of content taught and/or showcase within another discipline, usually an artist form of expression. On the other hand, PBL is a teacher-facilitated and student-driven model of learning. Students pursue knowledge and learning through inquiry approaches. An essential question drives the learning process guided through

research by a teacher. Focusing more on child-centered learning, collaboration, and real-world problems will better prepare our students for the 21<sup>st</sup> Century better than the substance of traditional curricula (Ogle, Pink, & Jones, 1990).

The evaluation of MindQuest21, will provide new information and valuable insight in the area of teacher preparation, implementation efficacy, and potential school and/or district expansion in this new teaching and learning approach. The theoretical foundation for this program evaluation uses a constructivist theory approach (Fosnot, 2005) and the instructional strategies conceptually related and/or derived from it, represent potentially viable alternatives to lecture and recitation approaches to instruction. A core assumption of constructivist theory is that learners actively construct knowledge through activity, and the goal of the learning experiences designed by teachers is to promote a deep understanding rather than superficial (and short lived) memorization. Hence classroom interactions should engage students in activities that give them a sense that their school-acquired knowledge is relevant in real-world situations (Brown, Collins & Duguid, 1989).

## CHAPTER THREE: METHODOLOGY

### Introduction

This chapter describes the purpose, design, data collection, and analysis methodology for the first-year program evaluation of MindQuest21, a PBL model. The research process includes preliminary and post professional development teacher surveys, individual teacher and focus group interviews, classroom observations, and samples of MindQuest21 PBL artifacts.

The remaining sections in this chapter focus on the research question and related questions, participants, setting, data gathering, and data analysis. I chose to research the professional development approach of MindQuest21 because of its careful design, hands-on approach, and the purposeful integration of 21<sup>st</sup> Century skills needed in our classrooms. The opportunity to work with the D21 faculty presented an invaluable setting for the examination of a potentially replicable transition of pedagogy process in a progressive, diverse, and transformative educational environment.

### Program Evaluation Research Model

In my experience as an educator, every action and decision regarding curriculum was carefully examined through an evaluative thinking model. It is imperative to look at investments in professional development of teachers and administrators from many perspectives. Given that school resources are extremely valuable and scarce, any school or district moving toward a 21<sup>st</sup> Century instructional practice community needs to be strategic with limited funds. Whether these funds should be allocated for pedagogical transitions to new teaching methods, the deployment of classroom resources, high teacher

collaboration opportunities, or increased investments in classroom technology tools, all need to be very well thought out and contribute to a carefully designed theory of action.

Educators have been subjected to a great amount of new methods and practices based on policies, accountability systems, leadership changes, and shifting educational philosophies. Although it's important to be open minded, progressive, and responsive to school dynamics, successful school leaders collaboratively develop and lead grounded theories of action with specific and targeted strategies for success which are proactively adaptive, inclusive in design by many school community stakeholders, and effective in driving all major decisions related to personnel roles and responsibilities, curriculum, assessments, instructional resources, and other valuable commodities such as space and time.

While evaluative thinking, inquiry, and judgments are as old and inherent to our human species, formal and systematic evaluation as a field of professional practice is relatively recent. In the book, *Utilization-Focused Program Evaluation*, Patton (2008) states, "evaluation is done for specific intended primary users, for specific intended uses p.37)". Patton describes program evaluation as the systemic, collection of information about the activities, characteristics, and results of programs to make judgments about the program, improve or further develop program effectiveness, inform decisions about future programming, and/or increase understanding.

The evaluation of Mindquest21 is a purposeful examination of a PBL professional development model. Information derived from this experience could greatly contribute valuable insights, relevant data, and timely feedback necessary for further development

of alternative pedagogical approaches in our classrooms, and more informed options for optimal teacher development implementation models.

Pragmatism is the philosophical framework for this program evaluation and characteristic of this genre of methodology is the orientation to decision making and hence to management. The primary emphasis is on producing useful information, the practical and pragmatic value base, and the methodological stance. Evaluators in this genre pragmatically select their methods to match the practical problem at hand, rather than as dictated by some abstract set of philosophical tenets (Howe, 1988; Patton, 1988).

### Research Questions

#### *Primary Research Question*

The primary question for this study is: “Is MindQuest21, a professional development methodology, an effective model to change a sample of D21 teachers’ pedagogy from traditional to project-based learning approaches?” The answers to related questions will build a foundation for the answer to this primary question.

#### *Related Research Questions*

1. How has the professional development experience shaped teacher attitudes towards readiness for PBL instructional designs?
2. How has the use of PBL helped teachers integrate 21<sup>st</sup> Century skills, CCSS, and technology tools into lesson planning design, delivery, and assessment?
3. What were teachers’ perceptions of how students benefited from project-based learning?

PBL is a student-driven, teacher-facilitated approach to learning. Learners pursue knowledge by asking questions that are of personal interest, relevance, and curiosity.



Many teachers have not had the opportunity to release their knowledge deliverer modality and may find it difficult to empower students with a new role within the classroom environment. This program evaluation will examine the process of a teacher and student paradigm shift. Given that only a volunteer sample of staff participated in the professional development experience, a primary factor of the evaluation will be the perseverance and consistency with which these teachers develop their pedagogy to a more student driven model.

In addition, with high stakes testing accountability processes that most often drive district schedules, curriculum, and varied assessments, this evaluation will also examine the sufficient and appropriate administrative investments and infrastructural supports to enable and encourage a successful transition to school-wide and district-wide PBL approaches. This will include potential changes in personnel roles and responsibilities, dedicated coach time, purposeful re-examinations of teacher evaluation goals and objectives, and committed resources for continued growth and successful PBL sustainability. Being the first year of PBL implementation in D21, the teachers who were professionally prepared for this instructional shift will need to model, guide, and advocate for this new approach with their grade level peers who were not involved in the professional development process.

The professional development MindQuest21 process emphasizes an increased awareness of CCSS, the required critical thinking skills necessary for student success, and the need for differentiation of instructional practices. Based on D21's current practices, planning and preparation is a grade level collaborative responsibility. The evaluation will include focus group questions which will potentially identify the

increased awareness of needed ongoing support in these critical areas for participating and non-participating teachers.

The active learning process of PBL takes students' various learning styles and preferences into account. Students may select their preferred learning environment, process, or outcome. This evaluation will examine, through classroom visits and interviews, how teachers are facilitating student choice which enables them to become more independent and responsible for their own learning.

### Participants

This program evaluation examined a sample of teachers in the D21 who participated in a process of professional development utilizing the MindQuest21 PBL model, in its first year of implementation, throughout the academic school year. A primary objective of this evaluation was to capture a group of volunteer teachers' perceptions of their own pedagogy and how these perceived skills sets aligned with new approaches to meet higher academic standards and rising expectations for the success of a growing diverse student population.

This experience exposed 70 teachers in grades K-5 (approximately 1/3 of the district teaching staff) to a guided learning experience surrounding the alignment of a PBL model, Common Core State Standards (CCSS), their curriculum, and 21<sup>st</sup> Century skills (4C's - communication, collaboration, creativity, and critical thinking). During their four-day summer institute professional development experience, they began planning for implementation at the classroom level identifying collaborative teams of students, utilizing technology where appropriate, and expanding their intended use of 21<sup>st</sup> Century skills with integrated CCSS. This increased awareness also facilitated the

continuous development of additional aligned projects consistent with the schools' curriculum that purposefully integrated PBL, 4C's, and CCSS units of study.

The program evaluation began with an introduction and explanation of the purpose of the study to the school administration and leadership teams of the four elementary schools involved in the pilot implementation. This was a full-day meeting where the study was introduced, subsequent questions related to the study were addressed, and approval was given. Additional expectations of this meeting were to identify voluntary participation of teacher groups from all four schools, clarify the administrative expectations of the study, explain the content of the four-day teacher institute (scheduled for July 16<sup>th</sup> – July 19<sup>th</sup>), and schedule the subsequent follow-up classroom visits and the 2012-13 academic school year teacher collaboration meetings around their formative development of PBL integrated units of study.

#### Setting: Progressive School District 21

D21 is comprised of four elementary schools, serving Pre-Kindergarten through fifth grade, and one junior high, serving grades sixth through eighth with an enrollment of 3,642 children. D21 is known for high academic achievement, a strong sense of community, and active family involvement. The D21 Vision is: Ignite passion, inspire excellence, and imagine possibilities. The D21 Mission reads:

“We embrace the future with optimism, working in partnership with our community on behalf of our children. We develop intellect, engage creativity, foster responsibility, and build positive and collaborative relationships to enable all children to thrive in a changing and increasingly global society.”

The Illinois communities served are parts of Carol Stream, Glendale Heights, Glen Ellyn, Lombard, and Wheaton. Graduates of D21 attend Glenbard West High in Glenbard District 87. D21 students represent many different cultures, socio-economic circumstances and family situations, and speak approximately 50 different languages including Spanish, Vietnamese, Urdu, May May, Swahili, Polish, and many more. Below is longitudinal enrollment data which shows a four-year trend of White, Hispanic, and Black student enrollments alongside comparable Illinois state trend enrollments.

Table 5.

Progressive School District 21 Student Characteristics Race/Ethnicity (2010-14)

<b>Domain</b>	<b>Year</b>	<b>White (%)</b>	<b>Black (%)</b>	<b>Hispanic (%)</b>
<b>District</b>	<b>2014</b>	<b>66.6</b>	<b>4.3</b>	<b>13.6</b>
<b>District</b>	<b>2013</b>	<b>68.2</b>	<b>4.1</b>	<b>13.2</b>
<b>District</b>	<b>2012</b>	<b>69.5</b>	<b>4.1</b>	<b>12.7</b>
<b>District</b>	<b>2011</b>	<b>71.3</b>	<b>4.4</b>	<b>11.8</b>
<b>District</b>	<b>2010</b>	<b>73.5</b>	<b>3.3</b>	<b>10</b>
<b>State</b>	<b>2014</b>	<b>49.9</b>	<b>17.5</b>	<b>24.6</b>
<b>State</b>	<b>2013</b>	<b>50.6</b>	<b>17.6</b>	<b>24.1</b>
<b>State</b>	<b>2012</b>	<b>51</b>	<b>18</b>	<b>23.6</b>
<b>State</b>	<b>2011</b>	<b>51.4</b>	<b>18.3</b>	<b>23</b>
<b>State</b>	<b>2010</b>	<b>52.8</b>	<b>18.8</b>	<b>21.1</b>

Dr. Connie Moore has been D21's superintendent since April 19, 2006. She is a progressive and reflective school leader who embraces continuous student, staff, and community growth. Under her leadership a Long-Range Plan (LRP) was developed in 2007. This was a five year plan which is now being renewed to reflect the challenges of the 21<sup>st</sup> Century. The initial LRP was mainly concerned with the essentials of improving student achievement, creating financial accountability and strengthening stakeholder relations. In its first LRP, D21 aligned curricular areas, renewed instructional materials,

built their finances around identified educational priorities and created systems and processes to be transparent and to provide information to the school community.

Renewing the LRP has been a collaborative process that included focus group feedback from staff, parents, and community members. Now, the district is embracing the challenges of the 21<sup>st</sup> Century to deepen and broaden its work. This plan has six goals:

- . Student learning and achievement in the 21<sup>st</sup> Century
- . Development of human capital
- . 21<sup>st</sup> Century learning through technology
- . Ambassadorship: fostering the beliefs and behaviors that strengthen relationships
- . Communications: acquiring and sharing information
- . 21<sup>st</sup> Century finance and facilities

According to the 2011 Illinois District Report Card, D21 has a racial/ethnic background demographic of 71.3% White students, 4.4% Black students, 11.8% Hispanic students, 8.9% Asian students, 0.1% Native Hawaiian/Pacific Islander students, 0.2% American Indian, and 3.3% of Two or More Races.

The 2011 Adequate Yearly Progress (AYP) information states that three out of five schools (including the Middle School) in D21 did not make AYP in Reading and Mathematics. The district has not been identified for District Improvement according to the AYP specifications of the federal No Child Left Behind Act (NCLB). Although of the three that did not make AYP two are already on the State's Academic Early Warning Status (AEWS).

Also, although D21 has 90.6% of all students meeting/exceeding state standards in reading and 94.8% of all students meeting/exceeding state standards in mathematics,

their Hispanic and Asian students did not meet the state Safe Harbor Target (SHT) of achievement in reading. In addition, they also did not meet SHT for the Limited English Proficient (LEP) students in both reading and mathematics and did not meet SHT for students with disabilities or economically disadvantaged students in reading.

Also, according to the Illinois District Report Card, the instructional setting is conducive to enable and promote the implementation of best practices with low class sizes from Kindergarten through eighth grade at an average of 23 students to each teacher. This was accomplished through a 2001 referendum passed to improve programming, and reduce class size. Time devoted to core subjects is higher than the state average in Mathematics, Science, and Social science, but lower than the state average in English/Language Arts, particularly in grades sixth and eighth. The 234 teaching staff is predominantly white at 94.4%. The data shows 4.3% Hispanic and 1.3% Asian teaching staff. The teaching gender is also predominantly female at 87.6% and 12.4% male. The average teaching experience is 12.7% years. The percentage of teachers with Bachelor's degrees is 22.7%, and the percentage of teachers with Master's and above is an impressive 77.3%.

#### Data Gathering

The MindQuest21 program evaluation data was collected utilizing pre and post professional development surveys, individual and focus group interviews, classroom observations, and teacher and student artifacts. The intent was to capture critical pre-implementation data relevant to the professional development experience and subsequent implementation follow-up data. This process was used to determine the effectiveness and ultimate success of the MindQuest21 PBL model.

## *Survey*

A pre-professional development survey was administered to the D21 volunteer teachers on the first day of the summer institute followed by a post-professional development survey on the last day of the summer institute (see Appendix B).

All participants who were present on the first day were given a pre survey. They were asked to create a participant code that would provide anonymity and yet could be used to match to their post survey code. They used an alpha-numeric coding system that identified their district, their particular school, and a personal number known only to them. This provided an opportunity for additional analysis, if desired, school-to-school. On the last day of the summer institute all post surveys were distributed. Participants were asked to use the same code they had used on the first day and, as in the first administration, were given 30-45 minutes to complete the twenty question survey. Some of the original participants were district and school administrators or school stakeholders who did not submit a pre survey and/or were not present for the post survey administration. In addition, only surveys that could be matched to an original code were used. The total number of individual participant surveys used for pre and post analysis was forty-two.

This collective data has been captured on a spreadsheet (see Table 6 – Chapter Four) for ease of comparative analysis. The questions contained within the survey are specific to eight main categories:

- A. Project-Based Learning
- B. Technology
- C. Common Core State Standards & Project-Based Learning
- D. 21<sup>st</sup> Century Skills
- E. Project-Based Learning & Technology
- F. Pedagogy, Rubrics & Assessments

- G. Project-Based Learning/Technology/21st Century Skills
- H. Administrative/District Support & School Culture

These categories were created to gain critical insight in the area of formative teacher development towards a high quality, effective, and sustainable PBL classroom practice.

#### *Individual Interviews and Focus Groups*

Individual and focus group teacher interviews were administered throughout the school year to collect qualitative data, clarify and identify areas of concern, share successes, discuss student impact, and provide any additional necessary support (see Appendix C). Through an internal memorandum, sent by a district administrator, teachers interested in participating in individual interviews and/or focus group interviews were scheduled. Interview participants were advised that this research was supported by District 21's superintendent (see Appendix D). All interviewed participants in this study were advised, in writing, that their participation was voluntary and that all personal information would be kept anonymous (see Appendix E). The duration of each individual interview was approximately 45-60 minutes and was conducted during teacher preparation time. The focus group interview duration was 60-90 minutes.

The sample of teachers interviewed consisted of one teacher from each elementary school for the individual sessions and three teachers for the focus group interview which consisted of an ESL teacher, a curriculum specialist, and a literacy coach. The focus group participants, being non-classroom support staff, were able to adjust and modify their schedules to accommodate the longer interview duration. Since their primary roles and responsibilities impacted all schools, they offered a wider perspective on the first-year PBL implementation across the district.



### *Observations*

Classroom visits occurred throughout the 2012-2013 and 2013-2014 academic school years. Visits were planned to include all or partial participating elementary schools. Many teachers volunteered to be informally visited. My observations were focused on classroom environment, evidence of essential and guiding question(s) development, student teams, instructional strategies, standards-based instruction, 21<sup>st</sup> Century skills, use of technology, use of formative assessments and rubrics, and summative presentations.

The classroom visits were opportunities to observe PBL in action. Teachers volunteered for visits. Some of the teachers wanted informal observations, with reference to particular stages or elements of their projects, and had readily available completed project plans. Others simply wanted to extend invitations for summative presentations of student learning. These visits provided invaluable understandings and interpretations of intent in design planning to actual delivery of instructional goals and objectives.

### *Teacher and Student Artifacts*

An important part of this study was to examine authentic student PBL artifacts. Several teachers submitted their PBL Completed Project Plans for review (see Appendix F – Sample MindQuest21 Project Overview – pg. 1). These plans, created prior to a MindQuest21 PBL implementation, described each element and phase of the project cycle and were designed, by individual or teams of teachers, to meet specific learning objectives. I've included two PBL Completed Project Reports as examples (see Appendices H & I) following the MindQuest21 PBL model which demonstrate project development, intended objectives, skill development processes, and student learning.

The completed project plans reviewed provided a sense of the initial project design thinking, planning and preparation, standards, assessments, equipment, time, and space needed. The completed project reports provided all of the above as well as more detailed background information, process narratives, snapshots of student artifacts, evidence of 21<sup>st</sup> Century skills rubrics, and teacher reflections.

### Data Analysis

#### *Survey*

The gathered quantitative survey data results were coded and scored for comparative analysis before and after the professional development experience to identify which of the aforementioned eight categories and which specific questions had the highest confidence increases to determine the effectiveness of the MindQuest21 professional development summer institute in preparing teachers to implement PBL. A confidence increase of 23.8% or higher was used to determine a significant impact on teacher self-perception efficacy and preparation to implement a fully developed MindQuest21 project.

#### *Individual and Focus Group Interviews*

Qualitative data was collected following the four-day summer institute, using individual and focus group interviews. These were administered to gather information from the participating teachers regarding their implementation progress while the school year was in process. Questions were structured to motivate relevant and rich discussion around their thinking about the PBL process although there were also opportunities for unstructured responses to allow for natural dialogue and genuine feedback from the voices of the participants. The questions were designed as follow up inquiries to the

formative process of PBL implementation. Data from these individual and focus group interviews was transcribed and reviewed to glean valuable information regarding teacher receptivity, curriculum integration, and most importantly student application of PBL practices which directly addresses one of the related questions of this study: “How has the professional development experience shaped teacher attitudes towards readiness for PBL instructional designs?”

The primary research question focused on the transition of teacher pedagogy from traditional to inquiry and project-based learning approaches. Therefore, the interview questions were classified into four categories: Background Questions, MindQuest21 Professional Development, Implementation Process Questions, and Post Implementation Questions.

#### *Background Questions (1-3)*

Although these questions were primarily created to gather participant attribute data, they also provided an opportunity to set a safe tone and space for candid responses. Participant teachers’ experience ranged from 4 – 8 years. Their teaching assignments included first grade, second grade, third grade, literacy coach, ESL teacher, and curriculum specialist.

#### *MindQuest21 Professional Development (4-9)*

This set of questions focused on the MindQuest21 quality of content and formative process of professional development effectiveness. Specifically, whether the teachers felt prepared to implement PBL practices in their classrooms, changes to individual and collaborative teacher planning and preparation dialogue, students’ reactions to PBL approaches, and relevant administrative support.

### *Implementation Process Questions (10-17)*

These questions were related to instructional content choices for PBL, challenges for implementation, classroom environment, integration of CCSS standards and 21<sup>st</sup> Century skills in PBL, and increased understanding of how the CCSS standards and 21<sup>st</sup> Century skills relate to a PBL design.

### *Post Implementation Questions (19-30)*

These questions provided reflective opportunities for teachers to express their thoughts around the PBL preparation they received and to gain valuable information about their implementation efforts. Questions included recommendations and improvements for MindQuest21 effectiveness, follow-up meeting efficacy, causes for non-implementation of some participants, likelihood to advocate for PBL, and support for their district's educational direction.

All sessions were recorded and were transcribed to identify key words and dominant themes that would lead to finding patterns of information which were critical to the interpretation of the study.

### *Observations and Artifacts*

The classroom visits, collections of teacher project plans, and student artifacts provided an authentic view of the work that was being developed within the district. During my classroom visits it was clear that the teachers had introduced a new way of teaching and learning to the students. The teacher project plans and reports provide a thorough opportunity to review the planning, preparation, and implementation efforts that were applied and the student engagement and learning that occurred throughout the span of the project.

## Limitations

As I entered into this study I recognized limitations to the possible replication and application of my findings. This study took place in a single school district with unique characteristics. This program evaluation focused on four elementary schools in a middle class suburb west of Chicago. The teachers in this school district are very autonomous and self-directed. They meet and collaborate outside of school hours and have a strong sense of dedication to their students. Their administration provides them with needed classroom resources, collaboration time for planning, and practice distributive leadership decision-making among staff members. While other schools and/or districts may also be transitioning into project-based learning, their contexts, conditions, competencies, and cultures may be very different, either contributing to or challenging the ease of replication. Comparing the results of this study with other schools and/or districts with differing demographics, administrative support, teacher collaboration, and instructional resource(s) allocation will bring different challenges and needed investments in educational priorities for PBL implementation success.

Since this was the first year of the MindQuest21 PBL implementation, there were inherent challenges which included: the program being studied was not fully developed; there were no established criteria for success; and there were a limited number of participants in this study which warrants careful consideration if intending to replicate results on a larger scale.

Having been an urban educator and administrator, as an evaluator, I have my own perceptions of educational priorities and a sense of social justice for underserved students. Evaluating a program that was being implemented in a suburban community

where students of color are becoming the new population, was a delicate balance of self-consciousness throughout the process of the study. I had to be purposefully impartial to others' expectations of diverse students' abilities, aware of perceptions of my own minority status while interacting with the staff, and not allow my own biases to influence the study.

## CHAPTER FOUR: FINDINGS

This research was conducted as a program evaluation following the guidelines of Patton, (2008). The study was conducted to answer the primary question: “Is MindQuest21, a professional development approach, an effective model to change a sample of D21 teachers’ pedagogy from traditional to project-based learning approaches?” As a researcher I followed the process implementation of this PBL program and challenges faced by one Illinois suburban school district at the early stages of transitioning from traditional instruction to full district inquiry-based learning through PBL.

The following synthesis and analysis is based on data collected through pre and post surveys administered to participating teachers before and after their professional development four-day institute; three interviews with individual teachers, one teacher focus group interview; classroom visits; and the review of teacher and student artifacts through completed project plans and completed project reports. Data will be presented in the following order:

- Surveys to (1) assess teachers’ self-perception readiness to implement project-based learning post MindQuest21 professional development, (2) identify areas of growth and needed follow-up, (3) develop next steps and district support for full PBL transition and sustainability.
- Individual and focus group interviews to more deeply understand the teaching and learning implementation experiences of the participants involved in the MindQuest21 pilot. This data will be presented thematically.

## Survey Data

The survey results below measure in which aforementioned categories of the professional development experience the teachers felt most impacted. While some of the responses produced neutral results, there were some areas with significant confidence and readiness growth. Most worth noting are the questions with an increase of more than 23.8% from pre to post survey results. They are bolded in the table below:

Table 6. – Survey Data Summary

Survey Question (# / Category / Statement)		PRE AVE	POST AVE	Diff (#)	Var (%)
1	<b>A I have a high understanding of Project Based Learning (PBL).</b>	<b>3.3</b>	<b>2.2</b>	<b>1.1</b>	<b>33.6%</b>
2	B I currently use technology as an integral part of my teaching and learning discipline.	2.1	2.1	0.0	0.0%
3	A I have adequate access to tools, time, and space for PBL approaches in my classroom.	3.2	2.7	0.6	17.4%
4	A I feel that curriculum accountability does not allow for enough PBL approaches in my pedagogy.	3.3	3.3	0.0	0.0%
5	<b>C I have a full understanding of the Illinois Common Core State Standards as related to PBL.</b>	<b>3.4</b>	<b>2.4</b>	<b>1.0</b>	<b>28.4%</b>
6	<b>C I feel prepared to introduce PBL with a Common Core State Standards focus.</b>	<b>3.6</b>	<b>2.2</b>	<b>1.4</b>	<b>39.1%</b>
7	<b>D I have a full understanding of 21st Century skills.</b>	<b>3.0</b>	<b>2.3</b>	<b>0.7</b>	<b>23.8%</b>
8	<b>E I feel confident and proficient to implement PBL with technology in my classroom.</b>	<b>3.4</b>	<b>2.4</b>	<b>0.9</b>	<b>27.3%</b>
9	E I value the use of PBL integrated with technology to improve instruction.	1.8	1.8	0.1	3.0%
10	H I feel supported by my administration to implement PBL in my classroom.	2.1	1.8	0.3	14.8%
11	H The culture of my school encourages and supports PBL.	2.3	2.0	0.3	12.2%
12	B I am comfortable using online tutorial programs.	2.1	2.1	(0.0)	-1.3%
13	B I integrate digital curriculum as part of my lesson planning options.	2.8	2.4	0.4	12.9%
14	B I currently use computer-based assessments for data-driven decision making.	2.9	2.3	0.5	18.9%
15	F I am familiar with and use authentic assessments in my curriculum.	2.3	1.9	0.5	19.5%
16	F I am proficient with assessment rubrics.	2.0	2.0	(0.0)	-0.1%
17	B I have facilitated project management in my classroom using technology.	3.3	2.7	0.6	18.4%
18	A I currently use interdisciplinary project-based teaching and learning models.	3.4	2.8	0.6	18.4%
19	<b>G I use PBL and technology to differentiate and individualize learning to support student mastery of core academic content and 21st century skills.</b>	<b>3.7</b>	<b>2.8</b>	<b>0.9</b>	<b>24.5%</b>
20	<b>D In my district professional learning communities use technology infrastructure and instructional tools that enhance 21st Century skills.</b>	<b>2.9</b>	<b>2.3</b>	<b>0.6</b>	<b>21.9%</b>
		<b>2.8</b>	<b>2.3</b>	<b>0.5</b>	<b>16.6%</b>

The following is a narrative of the bolded questions from the table that describes the findings from the pre to post survey results. The six questions are organized from highest to lowest impact on teachers' responses.



*Question 6 - I feel prepared to introduce PBL with a Common Core State Standards focus.*

The teachers' increased self-perception of feeling prepared to introduce PBL with a Common Core State Standards (CCSS) focus by a 39.1% variance demonstrates their gains in understanding of the integration between PBL process elements and the expectations of the (CCSS). The new standards rebalance the equation between content and skills. Effective PBL teachers recognize the need to provide students with multiple opportunities to apply what they know and can do through the mastery of 21<sup>st</sup> Century skills. This is especially significant since the CCSS provide an invaluable opportunity for teachers to shift their primary roles of curriculum deliverers to curriculum developers. The use of PBL pedagogy, which is premised on active and engaged student voice and choice, deeper learning opportunities, real-world essential questions, and embedded 21<sup>st</sup> Century skills (5Cs-Critical Thinking, Creativity, Collaboration, Communication, and Cultural Responsiveness) into curriculum development and implementation, allows teachers more flexible and creative opportunities to address relevant student interest-based topics particularly important for our growing diverse populations in our rapidly changing American schools. This supports the findings of Bellanca, 2013, where he advocates for shifting the implementation of the CCSS from a mandate to a creative challenge. He states, "What are the Common Core State Standards?" The short answer is: These are a U.S. set of K-12 standards in English language arts / literacy and mathematics. These standards are meant to guide school leaders and teachers in revising their curriculum, instruction, and assessment to align and adopt state priorities for what

all students need to know and do for living, learning, and working in the 21<sup>st</sup> Century's global economy (p. 19).

As previously stated our demographics are rapidly shifting to more varied cultures and cross-cultural identity formations. A PBL approach to teaching and learning prepares *all* students to meet the demands and diversity of complex local and global issues by integrating relevant content, equitable and varied opportunities for 21<sup>st</sup> Century skill development, and valuable inquiry process skills that are authentic and meaningful to students lives.

*Question 1 - I have a high understanding of Project-Based Learning.*

The pre to post survey results of this question, with a variance of 33.6%, confirmed an increased understanding of what PBL is and why PBL is an applicable and appropriate pedagogical shift for our current diverse students' learning needs. According to Laur, 2013:

Different students bring different learning styles and distinctive background experiences that may impact how they go about solving the challenging investigation. In any case, the application of critical thinking skills to solve the challenging investigation creates a culture of engagement and promotes a deep understanding of the core content and standards for learning (p. 5).

Beyond what PBL is, when teachers become keenly aware of new student expectations and understand the foundational reasons of *why* project-based learning facilitates a smooth transition to CCSS, promotes language development for diverse learners, and provides opportunities for 21<sup>st</sup> Century skills development, they also begin to develop a sense of ownership and empowerment to begin the transition to new and exciting multidisciplinary learning experiences and real-world investigations which involve active problem solving student –to student connections.

There are many versions of inquiry/project/problem based learning models in today's schools and in teachers' pedagogical approaches. PBL is an extended "project" process and takes several combined forms of designing, solving real-world problems, and investigations of open-ended questions. Newer "XBLs" – problem-challenge-and design are basically modern versions of the same concept. All fall under inquiry-based learning which also includes research papers, scientific investigations, Socratic Seminars or other text-based discussions. The results of this question also demonstrated a high understanding among the participating teachers regarding the specific MindQuest21 PBL Life Cycle element criteria, and revealed significant pedagogical growth of teachers feeling prepared to effectively introduce the process into new curriculum design and delivery.

*Question 5 - I have a full understanding of the Illinois Common Core Standards as related to PBL.*

This question further focused on the interrelationship and understanding of *why* PBL lesson design is an appropriate method to address new standards' thinking and delivery. The standards emphasize creativity, collaboration, critical thinking, presentation, and problem solving through effectively guided research and inquiry processes. Teaching through inquiry, planning and designing authentic and relevant student centered learning experiences, identifying and integrating appropriate multi-disciplinary standards with individual and team responsibilities utilizing a variety of engaging resources, and guiding students to a new way of learning is a dramatic shift in a number teaching practices. If implemented strategically, these new practices can increase a student's desire to learn, activate deeper engagement in the learning process, and

provide continuous opportunities for collective learning, team development, and individual leadership skills, all necessary for 21<sup>st</sup> Century career readiness. The pre to post survey result variance increase of 28.4% is significant since it demonstrates an understanding of how CCSS can be effectively integrated into a PBL collaborative classroom learning process. In the book, *Visible Learning for Teachers*, Hattie, 2012 states:

Visible teaching and learning occurs when learning is the explicit and transparent goal, when it is appropriately challenging, and when the teacher and the student both (in their various ways) seek to ascertain whether and to what degree the challenging goal is attained. Visible teaching and learning occurs when there is deliberate practice aimed at attaining mastery of the goal, when there is feedback given and sought, and when there are active, passionate, and engaging people (teacher, students, peers) participating in the act of learning. It is teachers learning through the eyes of students, and students seeing teaching as the key to their ongoing learning (p.18).

This is a key paradigm shift for the classroom learning community since PBL encourages more active mental engagement, reflection, and meta-cognition on behalf of both students and teachers. The MindQuest21 PBL Life Cycle process promotes student learning through highly relevant topics, authentic questions, constant teacher and peer feedback, self-reflection, and various outcome and product venues that demonstrate deeper learning. The teacher's focus shifts from what students think to how to use students' developing thinking skills to increase achievement and mastery of CCSS.

*Question 8 - I feel confident and proficient to implement PBL with technology in my classroom.*

Although PBL implementation is not dependent on the use of technology it does facilitate and ultimately enriches many of the MindQuest21 PBL Life Cycle elements. The collective results of this question demonstrated a 27.3% variance from pre to post

professional development with regard to the self-assessed competence level teachers had with their instructional technology tools and the transition steps they would use to potentially and appropriately transfer these tools into a PBL design and implementation approach. This, however, can be misleading since digital competence is subjective and difficult to assess. The perceived optimal use of technology, if not combined with strategic and collaborative planning for relevance to student learning, does not always yield effective results for high quality project based learning. This concurs with the findings of McFarlane, 2015, where she states:

A whole-school approach, with support provided both for the project activity and for those implementing it, contributes to device use being embedded across the curriculum. This requires time and resources and a recognition that teachers' needs vary and they move at different speeds. The least confident teachers need evidence, models, and examples of effective use. The more engaged risk-takers want time for reflection, sharing and discussion (p. 27).

This recognition also applies to student use of technology for learning. Although technology surrounds our students' lives and they are living in a rapidly evolving digital age, their equitable accessibility and appropriate use of technology may vary greatly. Many may be highly proficient with digital interaction but they need to be guided and supported in understanding technology as a learning tool. McFarlane, believes that there can be great disparity in many students' development and use of technology and that several external factors can determine their appropriate application to new learning situations. "Learners for whom supportive context for developing expertise is not available, at home, or among friendship groups, and who are not pro-active in seeking help are much less likely to be effective users" (p, 27).

It is imperative that teachers recognize their own and their students' levels of perceived technology proficiency, its appropriate use in a learning setting, and have open

and collaborative dialogue about how these variations of digital competence can be collectively optimized to engage them in a more natural, productive, and active classroom learning process.

*Question 19 - I use PBL and technology to differentiate and individualize learning to support student mastery of core academic content and 21<sup>st</sup> Century skills.*

A review of the variance results of this question provided insight to the teachers' current knowledge and implementation of varied PBL processes and revealed an increased understanding by teachers to optimize opportunities for all students through skillful integration of differentiated instructional strategies, more emphasis on inquiry as the district-wide instructional framework for critical content delivery, improved awareness of relevant technology in the classroom, and provided a forum for discussion and focus on 21<sup>st</sup> Century skills development and deeper learning student experiences. This is significant since it related closely to which best practice instructional skills and strategies the teachers already used and/or understood as effective for student learning. This is particularly important for teaching at-risk, special education students and/or ELLs since PBL promotes the use of many research-based practices but is much more deliberate with the integration of 21<sup>st</sup> Century skills, self-assessment, peer-assessment, and reflection. Gottlieb (2006) cautions that the concept of self-assessment may be new to some ELLs, particularly those who have been educated in other countries, where student voices, feelings, opinions, and choices are not encouraged. She advises. "Teachers should gradually introduce this idea, perhaps initially as a whole-group language experience. Later, individual students can express their thoughts on learning

through interactive journal writing where teachers provide feedback, prior to engaging in self-assessment independently” (p. 142).

The high increase in pre to post results of 24.5% can be interpreted as an increase in awareness of how PBL can be an effective instructional framework for transitioning successful investments in effective pedagogical growth and in providing opportunities to further develop expertise within a more interactive classroom setting.

*Question 7 - I have a full understanding of 21<sup>st</sup> Century skills.*

Using the Partnership for 21<sup>st</sup> Century Schools (P-21s) Framework for 21<sup>st</sup> Century Learning (<http://www.p21.org/our-work/p21-framework>), the teacher participants were guided through a process of web-based navigation for potential implementation of specific 21<sup>st</sup> Century skills and interdisciplinary themes within their developing PBL curriculum designs. The 23.8% variance from pre to post results for this question appraised the teachers’ full understanding of 21<sup>st</sup> Century skills, their current, if applicable, usage within their pedagogy, and the level of integration already used to deliver interdisciplinary curriculum content.

In many cases, 21<sup>st</sup> Century skills are perceived to be contained to the use of instructional technology. While the use of technology in the classroom is imperative for today’s students we should also be promoting our teachers’ understanding, attention, and development of individual and collective student skills in communication, creativity, critical thinking, and collaboration. These skills can be easily integrated into content-driven curriculum once school communities resolve to develop a clear conception of specific learning goals derived from focused ideas and essential questions. In the book *21<sup>st</sup> Century Skills: Rethinking How Students Learn*, McTighe & Seif, 2010 address the

need to closely examine our current school curriculum goals and the structures that either facilitate or inhibit the attainment of 21<sup>st</sup> Century outcomes. One key guideline is the focus on “Big Ideas” in Core Subjects and 21<sup>st</sup> Century Skills. Their findings address the need to re-examine an already crowded curriculum and shift to key ideas and questions chosen as fundamental to the discipline, thought provoking, and support transfer of learning in new situations.

Because curriculum is more focused, teachers have time to “uncover” it by engaging students in analyzing issues, applying critical and creative thinking to complex problems, working collaboratively on inquiry and research investigations, accessing and evaluating information, applying technology effectively, and developing initiative and self-direction through authentic, long-term projects (p. 156).

From gleaned new, viable technology skills, to becoming proficient communicators and advanced problem solvers, students benefit when their teachers have a clear sense of the necessary integration of both optimal application of technology and the inquiry/project-based skills needed in a 21<sup>st</sup> Century global society and also have opportunities to practice, reflect, and grow together.

The survey questions were also comparatively analyzed by the aforementioned eight categories. The following Category Data Summary Table – 7 shows which areas were most impacted by a minimum variance of 24.5 % between the pre and post surveys of MindQuest21 PBL.



Table 7. – Category Data Summary

Category Specific		Pre. Avg.	Post. Avg.	Diff. #	Var. (%)
A	Project Based Learning	3.3	2.7	0.6	17.4%
B	Technology	2.6	2.3	0.3	11.3%
<b>C</b>	<b>Common Core Standards &amp; Project Based Learning</b>	<b>3.5</b>	<b>2.3</b>	<b>1.2</b>	<b>33.9%</b>
D	21 <sup>st</sup> Century Skills	3.0	2.3	0.7	22.9%
E	Project Based Learning & Technology	2.6	2.1	0.5	18.8%
F	Pedagogy, Rubrics & Assessments	2.2	2.0	0.2	10.4%
<b>G</b>	<b>Project-Based Learning/Technology/21<sup>st</sup> Century Skills</b>	<b>3.7</b>	<b>2.8</b>	<b>0.9</b>	<b>24.5%</b>
H	Administrative/District Support & School Culture	2.2	1.9	0.3	13.4%
Averages		2.9	2.3	0.6	19.1%

The results show Category C - Common Core Standards and Project Based Learning and Category G - Project-Based Learning/Technology/21<sup>st</sup> Century Skills as having the highest increase from pre to post survey. This demonstrates significant growth by the participants in understanding the interrelated nature of the CCSS and how a PBL approach to instruction facilitates meaningful learning through inquiry. It also reveals new insights and connections made by participants relative to how PBL enables teachers to address multiple discipline content standards, the effective and relevant use of technology, and the integration of essential 21<sup>st</sup> Century college and career readiness skills.

These results also demonstrate an increase in teachers' awareness about their effect on student learning. This fosters a consciousness about their role in culturally responsive opportunities within their new curriculum designs. This experience also provided the teachers an opportunity to evaluate how their actions directly affect their students by seeing learning through their students' eyes. This outcome supports the findings of Hattie, (2012) where he asserts the following: "Fundamentally, the most

powerful way of thinking about a teacher's role is for teachers to see themselves as *evaluators* of their effects on students" (p.18).

### Survey Data Summary

The survey data provided invaluable information regarding the effectiveness of the MindQuest21 Summer Institute in three major areas:

- (1) Assess teacher's self-perception readiness to implement project-based learning post MindQuest21 professional development.

The aforementioned areas of significant growth were demonstrated in specific pre and post questions of the survey questions (Table 6). These results captured the gains in increased understanding of PBL as related to the Common Core State Standards, integration of 21<sup>st</sup> Century skills, the application and relevance of differentiation best practices, and the use of appropriate technology.

When these questions are examined by category specific results (Table 7) they further support the highest growth to be in areas that are critical to successful design and implementation of PBL.

- (2) Identify areas of growth and needed follow-up.

The survey question data revealed the lowest (negative gains) results in the area of assessment and the use of rubrics. The data confirmed that the teacher participants did not gain proficiency, or a clear understanding, for how to effectively assess learning using a PBL approach, although they did reveal a level of familiarity with authentic assessments within their current curriculum.

The results also demonstrated a low level of comfort with the use of online tutorials, the perceived value of PBL integrated with technology to improve

instruction, and most importantly, teachers' feelings that curriculum accountability does not allow for enough PBL approaches in their pedagogy. The category specific results also confirm these areas to be of highest need for further development. These results are not unexpected since pedagogical transitions often take time to be assimilated and developed within a school culture. Nevertheless, they identified and provided a level of clarity for necessary follow-up and further development of the MindQuest21 PBL professional development model.

(3) Develop next steps and district support for full transition and sustainability.

Two questions on the survey (10 & 11 respectively) focused on teachers feeling supported by administration to implement PBL in their classrooms and their perception of the culture of their school encouraging and supporting PBL.

Comparatively, the survey results as well as the category specific results were among the lowest in gains. Although the district provided a volunteer summer institute opportunity to expose and develop teachers to new instructional approaches, the results of the survey demonstrate a need for additional follow-up support and necessary attention to various other school systemic routines, accountability structures, and ongoing collaborative decision making for PBL to flourish and not become an isolated and unsustainable professional development experience.

### Interview Data

The interview component of this program evaluation was applied using a standardized open-ended process. The questions were developed as a follow-up to the pre and post survey results and to gain more insight during actual implementation of the

PBL model of instruction (see Appendix C). According to Patton (2008), “Utilization-focused evaluation is inherently participatory and collaborative in actively involving primary intended users in all aspects of the evaluation” (p. 177). It was of great value to hear from the actual users’ experiences and to probe further for more detailed information related to their post professional development implementation practices.

### Themes

The interview data was transcribed and the following themes emerged as predominant concepts from the teacher responses:

- *Theme One: PBL fosters more authentic learning*
- *Theme Two: PBL increases teacher collaboration*
- *Theme Three: PBL enhances the desire to learn in all students*

*Theme One: PBL fosters more authentic learning.*

Project Based Learning allows for integration of new standards and engages students in more authentic learning experiences and processes suitable for the 21<sup>st</sup> Century. As Dayna Laur, (2013) states, “Students in today’s classrooms must be presented with complex problems and challenges to solve. These challenges are action oriented in nature and leave the philosophical questions to be contextualized within the process of the challenging investigation.” (p. 5). Today, more than ever, it is important that curriculum start with questions rather than mere delivery of information. Effective teachers will now need to know how to apply knowledge and information through co-planning and designing a problem-solving process that is engaging to students’ interests.

At the core of project-based learning is the advocacy for student learning experiences that are high in student relevance and authenticity. PBL means that students

are doing work that is real to them and it is authentic to their lives or the work has a direct impact on or use in the real world. Essential questions stimulate thought, provoke inquiry, and spark more questions, including thoughtful student questions. By tackling such questions, learners are engaged in uncovering the depth and richness of a topic that might otherwise be obscured by simply covering it.

Throughout the individual and focus group interviews, and in all observations, the theme of creating essential questions that are relevant and authentic to students was found to be the focus of all study participants. This was evident throughout many classroom observations. Several teachers posted big idea and essential and guiding question charts as anchors of learning goals and reflection activities of their projects. Graphic organizers were displayed as artifacts of collaborative ideation activities and brainstorming experiences. Teachers also stated that they had gained an increased awareness of how essential question co-development drives authentic student inquiry in standards-based projects and formatively adapted and transitioned traditional content within their classrooms into PBL designs. Many were shifting from a predominant traditional textbook -driven curriculum to creating standards-based authentic learning experiences.

One first grade teacher supported this finding when she shared her personal pedagogical transition:

For me I had a little struggle at the beginning with understanding the difference between the essential questions and the comprehension questions. Since we started with literacy...it almost can't work if you're trying to just do one standard. I feel it just comes together better when you look at a broader spectrum of your standards and the bigger picture. Figuring out what exactly is an essential question and how it's going to drive everything.

Another teacher discusses a collective and collaborative effort for essential question development through backwards design processes, exemplar resource queries, and reflection:

In my team a lot of conversations were going on about what is our essential question, what is the big picture that we're trying to get students to understand. Going from there, what pieces they need to get there and what are our standards, and so I feel like we had a lot more conversations about our finished product and what are we trying to get. What standards are we trying to cover and then thinking and doing a lot of looking up what other schools have done for PBL projects and using things we know we had success with before.

In an observation, as teachers reflected on their MindQuest21 professional development experience, their actual curriculum, and the deliberate content changes they wanted to make to instructional practice in order to connect and engage more students, they began focusing on real-world connections in selected topics to the lives of both their current and new students. In the book, *Our Worlds in Our Words*, Mary Dilg (2010), posits, "Beyond the complex social and cultural dynamics our students inherit in this multicultural society, the proliferation of texts and images on the Internet and readily available to many of our students both broadens and complicates their learning in a classroom. This emergent factor forces us as teachers to interrogate the meaning of reading and writing in our students' lives."

One ESL teacher shared her thoughts regarding the benefits of PBL for her multi-lingual students. She valued opportunities to collaborate with her peers and connect content and language development standards to real-world issues through relevant and culturally responsive essential questions.

I mean my students love it and what we're finding is, it really helps all students, especially ELLs, with their language development because it gives them a longer time to think and to listen, to speak, to read and write around a topic. And so they

really have a lot of exposure to language and they also have to work with their peers and so it's more authentic the way they are navigating.

Perhaps one of the most challenging tasks for teachers shifting away from traditional pedagogy to PBL methodology is crafting meaningful essential questions that encompass 21<sup>st</sup> Century Skills, cultural responsiveness, relevant interdisciplinary content, and triggers a connection to real world issues that affect our students' lives.

Real world issues provide a bank of opportunities for inquiry-based learning topics that can be used to develop motivation through the innate curiosity of our students. As 21<sup>st</sup> Century educators, we need to empower our students with the necessary skills and processes to investigate solutions to global dilemmas which will ultimately impact their future and generations to come. Our students are information rich with unparalleled resources unlike any past generations. Our primary task should be to awaken their minds and hearts to get involved in problem solving of real world issues and proactive actions that make a difference in their communities. They need to understand the hard issues which directly affect their future, quality of life, and learn how to get involved in potential policy changes, investigations around the evolution of laws which directly impact them, and the necessary processes to enact positive and progressive social change. One of the best metaphors for current educational programs can be found in, *Pedagogy of the Oppressed*, Paulo Freire (2010). Freire describes the relationships that currently exist, in many classrooms, between teachers and students as fundamentally narrative in character. The teacher narrates and the students receive. Freire further parallels education with the banking industry deposit concept where students become the depositories and the teacher the depositor. As 21<sup>st</sup> Century educators, and if we expect to prepare our students to thrive as adult global citizens, we should be shifting our beliefs, actions, and

practices to a more reciprocal teacher student relationships. Freire states, “The teacher’s thinking is authenticated only by the authenticity of the student’s thinking” (p.77). If students are increasingly challenged to think about problems relating to themselves in and with the world they will rise to the occasion. With new understandings and new approaches to content as it relates to them, they will develop a commitment to their own learning.

One teacher affirms this understanding when she states:

It’s really exciting...an exciting direction for many teachers here who have a lot of experience, it does feel comfortable. There are many people who were mourning the death of inquiry and that everything was kind of being dictated to skill-based and functional. Yes, skill-based and so to get back to a more inquiry-based curriculum has been...more authentic, more real world.

When asked about student reactions, all teachers expressed very positive experiences. One teacher’s statement captured the collective staff thinking:

They love it! They love the freedom! They love the opportunities!

Another teacher concurs and asserts:

Students are completely engaged in and jump all over it. I think that they don’t know necessarily that you’re doing something different but they are asking questions and researching and their creative side is really coming out. We’re just starting to present things in that way and they’re picking up on it and being very responsive to it.

The idea of essential questions, formed by scholars, teachers and students, has become a cornerstone of many reform efforts around the country. Teachers who use essential questions report that they are a powerful tool for focusing daily classroom activity on a meaningful goal. For students, essential questions are a clear statement of expectations- what they will know and be able to do, allowing them to take more responsibility for taking learning away from every lesson.



*Theme Two: PBL increases teacher collaboration.*

Teachers expressed the need for more time to collaborate on student interest-based projects, changing classroom environments, increased stakeholder involvement, integration of new technology tools, and the development of new assessments. Teachers need the inter-connectedness among each other if they are to develop the same sense of community in their students' classroom experiences. Educators, like any other professionals, need peer to peer interactions and reciprocal investments in order to grow and develop, Whitaker, Zoul, Casas, (2015).

The very nature of inquiry-based instruction promotes a high level of collaboration, communication, critical thinking, and creativity for student learning, therefore, the same culture needs to be pervasive throughout the adult-to-adult and adult-to-student relationships within a school attempting this type of transformative shift. When asked about the impact on collaboration and communication between both the students and among the teachers, many teachers responded as follows:

Students are improving their researching and summarizing skills, as well as leadership and presentation skills. Collaboration is improving. Students have taken more ownership of the products their groups create. Students have been more motivated by what the audience learns from the students' expertise. They care more about educating others and showing what they know.

Another teacher reacts as follows:

Collaboration and conversation was constant among teachers. Communication with students was seen on a regular basis at school. PBL builds a culture of collaboration and respect.

Many apprehensions drive the reluctance of teachers to shift from traditional to inquiry-based PBL instructional approaches. A common concern among teachers is that PBL will simply take too much time, both in terms of planning the projects and in

executing them. One teacher noted her concerns, “Collaboration has been difficult and we can’t necessarily work with each other on a project in the way we feel most benefits the students because of scheduling and groupings”.

Any successful transition to new instructional methodology requires well planned opportunities for high teacher collaboration. Moving to a school-wide PBL teaching and learning approach ignites inevitable change and has tremendous implications for many instructional and operational areas that trigger new decision-making for re-visiting school routines, structures, schedules, assessments, parent communication, and overall school community buy-in.

A more collaborative school environment increases the likelihood that all school stakeholders will ultimately benefit. As cited in, *What’s Worth Fighting for in Your School*, Fullan & Hargreaves (1996) assert “Open collaboration, extensive collegial conversation, mutual observation, and interactive professionalism are not yet an integral part of most teachers’ working lives.” There is a growing recognition of the need to break the isolation of our teaching norms. Peer coaching, mentoring, site-based management, and other distributive leadership models are making inroads to changing traditional communication structures and creating venues of open dialogue. We need more voices, around relevant, timely, and critical school/district issues which ultimately lead to more shared decision making, ownership, and commitment to instructional transformation. The re-structuring of internal communication structures can also lead to a broader sense of school/district community and open new portals of authentic and useful information from a variety of external school stakeholders.

In PBL, as we work to move students into team scenarios to cooperate, improve social and interpersonal proficiency, and help them improve their understanding of pertinent content and 21<sup>st</sup> Century skill development through deep research, discussions, and team learning efforts, we must also provide those same collaborative experiences at all levels of the organization to affect true pedagogical transition success. All teacher participants expressed their concerns in these areas. Below is a teacher comment related to collaboration:

I think this year we tried to make our project-based units more collaborative. I think our plan just kind of made us work together. We were seeking out each other's understanding of it and it just helped to have more than one mind on it. So the collaboration was there. Next year, we'll hopefully will do a bit more of that.

PBL requires that teachers purposefully plan and design learning environments conducive to high degrees of student collaboration and teamwork. Since one of the defining characteristics of PBL is the emphasis on group work the classroom space needs to be organized to support both lessons, stories, and project launch phases in whole group formats but also provide areas and places for critical break-out small group work. In addition, PBL classrooms are by nature unpredictable and student-guided so teachers must be flexible, supportive and engaged in the learning process sometimes from a spectator role. In PBL methodology teachers introduce project themes and goals, keep students and classroom resources organized, differentiate their roles to know when to teach, when to observe, when to give feedback, and exercise the restraint to step back and allow students to learn through trial and error. This is a difficult paradigm shift for many teachers who may not want to relinquish classroom control or may have apprehensions about student behavior management. Gains and ongoing development in this area were observed in several classroom visits. Many teachers creatively planned their project

launches, through a variety of venues - with or without - technology, strategically organized their student teams, methodically communicated new student roles and responsibilities, and effectively introduced collaborative learning and assessment tools and resources to encourage a more student interest and leadership-based classroom environment. It was clear that teachers were systemically executing their PBL planning and design thinking towards meticulously crafted implementation efforts. It was also uplifting to witness the transformative and courageous steps teachers were applying throughout their own formative PBL learning process as well as their focus on their students' development in deeper learning.

Pressures of time constraints, standardized assessments, and heavy student loads invite traditional, teacher-centered instruction. Most students play passive roles in classrooms dominated by conventional instructional models. In a review of instructional practices in American classrooms, Larry Cuban (1984) concluded that the high school of today is remarkably similar to the high school of the 1890s. Cuban found that just as in the 1890s today's high school classes are characterized by whole class instruction, teachers talking most of the time while students listen, little student mobility, and a narrow range of activities completed by the entire class at one time. A shift in instructional practice from traditional to inquiry-based instruction destabilizes this teaching and learning norm as it creates a level of uncertainty of self-competence in many teachers. This can be greatly reduced when savvy school leaders and teacher leaders collectively and collaboratively implement new instructional frameworks, such as PBL, that will ultimately impact various other peripheral and foundational school routines, rituals, and structures. Effective educators anticipate these challenges and subsequently

promote strong cultures of collaboration, provide support systems and valuable time for design and planning, build internal sustainability within cohorts of teachers shifting to new approaches, and formatively open dialogue spaces for feedback and improvement.

During the teacher interviews these concerns were verbalized and asserted by almost all participants as follows:

I think environment changes greatly because the kids are really taking control of their learning. They're working together to solve problems or answer questions and they're taking the lead. I kind of step back and let them do this, maybe redirect, facilitate, but, it's very open-ended for a long time.

Another teacher concurs:

Allowing student choice when, you know, you're working with groups and you can't control all of what the other kids are doing. You have to kind of trust they're doing their job. I always say this to people when they come in and they're like, "How do you know what they're doing when they're out there?"

With the current pressures of high stakes testing and traditional assessments, used in the majority of our schools, transitioning to PBL practices and assessments requires that teachers and administrators make sure they carefully design projects that integrate the standards they need students to know and be able to demonstrate. In addition, since PBL has different expectations for blending content and process standards, initially teachers will spend a great deal of time developing relevant essential and guiding questions to encompass inter-disciplinary content, either creating or replicating formative and summative assessments, designing reflection templates for student meta-cognition opportunities, developing individual and team products' roles and responsibilities, deciding weighted averages to appropriately assess learning throughout the project process elements, and ultimately assign a grade. This is a critical task that warrants appropriate investment of time and commitment from all levels of school faculty.

The Common Core State Standards rebalance the equation between and among content and skills. In every well-developed inquiry-based project experience, the learning focus is on a combination of knowing and doing. Students apply what they learn (content), and demonstrate the appropriate use of 21<sup>st</sup> Century (process) skills, in varied presentation genres and within collaborative team scenarios and individually graded project responsibilities. This shift changes teachers' expectations for student learning, encourages teachers to reexamine their current assessments, promotes dialogue around new forms of formative feedback to students, and places more emphasis on formal observations of 21<sup>st</sup> Century team skills that ultimately impact overall grading systems that better reflect students' deeper learning competence.

Research-based instructional strategies and classroom management have long been considered best practices in teaching although the research on assessment reveals that this step in the teaching and learning process can have dramatic effects on student achievement. The work of Marzano (2006) cites the research by Paul Black and Dylan William (1998) of more than 250 studies showing that formative assessment, in particular, does improve learning. In a PBL environment, greater emphasis is placed on the formative assessment feedback process needed to inform learning throughout a project life cycle. The paradigm shift of allowing students to receive formative responses of their work, from multiple sources, throughout their learning can be a significant and unsettling exercise for many teachers until they develop a sense of confidence through continuous and reflective practice.

Grades have been an integral part of the American educational system and have been used as high stakes indicators for many years. Assigning quarterly and final grades

to a series of activities, within a single discipline, for a multitude of students is and continues to be the norm in most schools. Many teachers work tirelessly to develop the most valid and reliable systems of assessment for their students and also methods of communicating their systemic process to parents and other stakeholders. Transitioning to a PBL framework of instruction, where formative and summative assessment is on both content and process skills, and where feedback is integral and may originate from multiple sources, requires strategic investment of collective teacher planning time and decision making on new assessment designs, use of classroom time and management, continuous individual and collective reflection, and critical communication to the students, in order to fairly and appropriately engage them in the development process of such an impactful instructional shift from the onset.

During the interviews all teachers contributed information about their PBL assessment development. Some teachers acknowledged the need to create and/or find new assessments that appropriately gauged both content and process skill development in a PBL designed lesson and began to deviate from their reliance on textbook driven assessments. One teacher stated:

As far as assessments, the groups and I played a part on determining their grades. They graded their group members throughout the process using rubrics. I used some assessments from our Science series, which the kids did great at, even though we didn't just follow the book and used more PBL created rubrics.

Many teachers spoke about their struggles with assessments in PBL implementation efforts. Being a first year program many teachers attempted to blend assessments they already felt comfortable with and gradually began to expose students to new assessments that measured more standards and 21<sup>st</sup> Century skills they hadn't formally recorded in the past. One teacher stated:

My speaking and listening standards didn't really have assessments. So that was just completely open for us to begin discussing as a teaching community. Based on our experience this year, some of the students were like "what are we going to say" since they were the first ones to experience a PBL presentation, so we all agreed that next year we'll definitely teach them these skills and how we'll assess before we start their projects. They wanted to get it right because they knew that Mom and Dad were going to come in and see a display, I just feel that it makes it more meaningful to them.

PBL planning and preparation requires much more time to develop than traditional instruction. As teachers begin to implement these processes they also develop new insights and reflections for improvements going forward. One teacher shared her thoughts after the completion of her first project with a group of fifth graders:

I think it was a memorable project for my 5<sup>th</sup> grade students. About 99.9% of the students were very engaged in this project and had a lot of fun creating their exhibits. Since the children invested so much time in creating their exhibits, I think they really learned a substantial amount on their Revolutionary War event or Revolutionary War group. However, since so much time was devoted to the creation of the projects, the kids' presentations fell short. Being my first experience with doing a PBL of this magnitude, I really think that I "blindly felt my way along" the project. I was not as organized as I would have liked to have been with this project.

More experienced PBL teachers recognize the dramatic shift students experience with PBL as a new approach to learning and ensure that students understand both the individual and team expectations of an inquiry-based PBL classroom and the distinct steps involved in deeper learning vs. traditional instruction. In a 2016 article published by Edutopia, Katie Piper, a high school social studies teacher in Bellevue, Washington recognized that there are students who resist this model and classified them into two types (<http://www.edutopia.org/blog/practical-pbl-challenges-of-assessment-katherine-piper>). She states:

Students of the first type do not enjoy school at all, and are looking for the path of least resistance. Because a PBL classroom is student-centered, and calls on students to produce, less motivated students will find it more difficult to "hide"



and be left alone. The second type of student has already been successful in traditional classrooms and is deterred by the challenges of this new model. These students are often highly motivated by grades, and worry that the project cycles will detract from direct content delivery (Piper, 2016 para. 1)

Effective PBL teachers recognize that they are crafting new classroom cultures that value and support new learning standards and 21<sup>st</sup> Century skills. Teachers need to build both individual and team accountability. In traditional classrooms, students have been primarily accountable to themselves and their own work. Teaching and grading collaborative projects requires the acknowledgement of new responsibilities for all classroom stakeholders. We need to implicitly teach self-directed student learning skills, encourage flexible team roles assignments, trust student judgement, and understand the dynamics of student relationships.

This is particularly important for digital natives who communicate and interact continuously through social media applications. Combining instructional technology and student web-based devices into PBL can be powerful tools for teachers who want to encourage multiple and wider perspectives into classroom content dialogue and investigations, offer students the options to use tools they feel competent with, and can ultimately promote the co-creation of more authentic and relevant assessment processes.

In an article from ed.gov on the Effects of Technology on Classrooms and Students (<https://www2.ed.gov/pubs/EdReformStudies/EdTech/effectsstudents.html>) the following is noted:

When students are using technology as a tool or a support for communicating with others, they are in an active role rather than the passive role of recipient of information transmitted by a teacher, textbook, or broadcast. The student is actively making choices about how to generate, obtain, manipulate, or display information. Technology use allows many more students to be actively thinking about information, making choices, and executing skills than is typical in teacher-led lessons. Moreover, when technology is used as a tool to support students in

performing authentic tasks, the students are in the position of defining their goals, making design decisions, and evaluating their progress (Effects of Technology on Classrooms and Students: Change in Student and Teacher Roles, para. 1).

Educators around the world are transforming their classrooms by stepping outside their norms, taking risks, and developing new awareness of how technology can be used for their students' academic development and also their own professional goals. They are forming "connected communities," which, in turn, is elevating them to greater heights and ultimately benefitting their school communities and students in positive ways (Whitaker, Zoul, & Casas, 2015).

The teaching profession has been dramatically impacted by the Internet. Since technology has captured our students' interest with elaborate visual displays and engaging rapid communication venues, the teacher's role has had to accommodate the effects on students this digital medium has produced. When considering the role that technology should play in project-based learning, teachers should focus on what value the technology brings to the learning process. This concern resonated with many of the participating teachers.

One third grade teacher who submitted a completed project report reflects:

Looking back on the unit, there were some bumps along the way and things that I would like to challenge my students, and myself, in the upcoming PBL units. I want to incorporate more technology for presenting their information. I hope to not only use "go to programs" like Power Point but to also have the students use flip cameras, utilize Kidsblog more, and just get my students more savvy in trying new things. In this unit they were more comfortable in reverting back to creating posters but when I did introduce new technology tools they did get excited.

Teaching digital natives, of all ethnic cultures, requires a strong recognition and understanding of their perspective on the world and how they think. They have formed a new culture. They are discerning visual learners, have access to an abundance of

information, value speed in communication, and multi-tasking is their norm. Technology has surrounded them since birth. Although they may not completely understand its evolution, the background programming codes, and how complex networks operate and why they were created, their natural and intuitive usage of technology empowers them with a perspective of the world that all is possible. Effective PBL teachers and school leaders can channel these innate skills beyond Internet searches and Power Point presentations for traditional content interpretations. They can provide forums and opportunities for students to investigate relevant issues, individually and in groups, using tools they feel proficient with and about topics that directly affect them, promote ‘technology culture’ discussions around digital ethics, practice open and honest dialogue about the unexpected effects the digital culture has produced in their lives, simulate real work world ‘think tank’ experiences with team-driven roles and responsibilities, authentically address the Common Core State Standards, and unleash the power of innovation.

*Theme Three: PBL enhances the desire to learn in all students.*

The 1988 film *Stand and Deliver* is the true story of mathematics teacher, Jaime Escalante, who helped a group of at-risk Hispanic students from East Los Angeles achieve unprecedented levels of success in their advanced placements tests in calculus. Much to the surprise of the school board who accused them of cheating, they retook the test and passed again. When asked to explain how he and they had accomplished this, he offered one word of explanation: *ganas*, Spanish for ‘desire’.

Extrinsic motivation (external influence) is too frequently utilized to “encourage” students to learn. However, there is a growing body of research that demonstrates the

power of intrinsic motivation or “one’s inner will, drive, determination, tenacity, and perseverance to want to learn,” known as conation (Huitt, 1999). The *will* is this intangible place *within* each person that internally drives or compels one to *want to learn* for the personal value and self-satisfaction of learning (Gholar & Riggs, 2004).

Teachers, as change agents, enable learners to begin or continue their journey to excellence: informed, prepared, open to success, and hopefully, inspired to pursue life and education with meaning and passion (Gholar & Riggs 2009). Throughout the interviews, focus group session, informal conversations, and in general observations, the theme of enhanced student motivation and desire to learn was the focus of all the study participants. One primary school teacher shared her reflection on the impact PBL has had on her students:

I will give a specific example. We have a unit in our level two second, and third grade that’s called ‘How Can I Improve My Community?’ Last year it was a perfectly nice little unit. The students thought about something they’d like to see change in the community. Many of them wrote about how we need more garden space.....but it really didn’t go anywhere and so as soon as that was over, we started talking about, how we could make it more authentic. So this year we gathered 16 community organizations who were willing to come in and talk to the students. After this interactive engagement from primary sources, students asked, “What would make our community an even better place for your organization?” From that experience, their research and their writing really took fire with some ideas.

Laur, (2013) wrote, “Designing a challenging investigation around a community or career connection creates a correlation between the course content, standards, and the lives of the students (p. 7)”. These types of connections increase student motivation and their desire to learn. Rather than focus on what many perceive to be apathetic tendencies of this generation, we should be tapping into our students’ innate innovative spirit with classroom inquiry approaches that directly tie to their interests.

Today's educators should be tapping into what matters to students. As digital natives and savvy social network users they have access to infinite portals of information. Therefore, we should be using instructional approaches that help them ask the right questions, investigate multi-perspective connections of past events to current issues, facilitate their ability to analyze cause/effect relationships, and become keen problem identifiers and effective problem solvers. In order to understand, empathize, and build collaborative partnerships with distinct local and global cultures, students need to know who they are, how they think, why they think that way, and what influences have shaped their own thinking.

During the post implementation interviews teachers were asked to reflect on their first semester project successes, obstacles, impact on students' skills, knowledge, attitude, and their own teaching practices. This mid-year reflection was their opportunity to pause and collectively discuss and record their perspectives around student learning, and their own growth as PBL implementers, via the outcomes of their initial PBL classroom experiences.

Focusing on increased students desire to learn, a first grade teacher shares her thoughts on her students' development:

We made the concept grade level appropriate. The students felt they could make difference with helping people in need. There was a large home support component. Common Core skills were supported through lesson (i.e. money, graphing, writing, collaboration, 21<sup>st</sup> Century skills, etc.). We see increased connections with other people that may be in need. They had a continued interest in supporting the community. They realized that many world-wide problems are also local concerns.

American students in the 21<sup>st</sup> Century are living in unprecedented times. The dynamic intersection of evolving cultures and new technology has provided them with

portals of new awareness. Today's students are not solely reliant on traditional media versions of global issues but rather have access to various social media connections around the world where they can construct their own truths. They have inherited a world where global issues seem closer to home than ever before. Their technological interconnectedness with the world has positioned them to better gauge and assess what is tolerable, what they will have faith in, and what they will no longer accept.

This interconnectedness has a dramatic implication for the types of classroom cultures that begin to develop in a PBL school/district community. Infusing 21<sup>st</sup> Century skills into core subjects actually ratchets up rigor. Recalling facts or terms from a textbook, or performing simple processes or procedures, place a low level of cognitive demand on students. Demonstrating deeper learning through planning, using evidence, and abstract reasoning, for example, is more demanding. Making connections among related ideas within the content or among content areas, or devising an approach to solving a complex problem, requires extended thinking and even higher cognitive demand (Webb, 1997).

In classrooms where deeper learning is the focus students are motivated and challenged and look forward to their next assignment. Many teachers expressed changes in classroom culture using PBL. One teacher states:

Students have become more willing to participate and share. In groups, students are more confident and it plays to their strengths. Students are developing a stronger sense of making concrete level connections to larger concepts that allow them to create new understandings.

Another teacher concurs:

We feel that deeper learning happens because the projects make our student learning goals much more global as the goals go from "hitting the standards" to

“how does my learning reflect what is going on in my world?” and then the skills and activities support that higher level of thinking.

When students engage in project-based learning over the course of their time in school, there’s an accumulating effect. They feel empowered. They see that they can make a difference. When they see a problem in their community or the wider world, they have the confidence and the inclination to contribute a solution.

#### Interview Data Summary

Throughout the interviews all teachers stated that PBL allows for greater integration of new standards and engages students in more authentic learning experiences and processes necessary for the 21<sup>st</sup> Century. Teachers also expressed the need for more time to collaborate on student interest-based projects, changing classroom environments, more stakeholder involvement, and the development of new assessments. In addition, teachers expressed their desire to focus beyond academic content and also address social-emotional and 21<sup>st</sup> Century skills to better serve their rapidly growing diverse populations.

As 21<sup>st</sup> Century educators we should be providing 21<sup>st</sup> Century technologically proficient students with opportunities and pathways to explore local and global issues from a variety of multicultural perspectives. It is our collective responsibility to expose our students to the multitude of today’s issues from varied historical lenses so they can develop their own theories of cause and effect outcomes, allow them to judge their own scientific relationships regarding the status of today’s world issues, based on their own equations, and provide them grounded foundations for highly probable and research-based solutions.

## CHAPTER FIVE: CONCLUSION

This program evaluation research focused on a first-year implementation of MindQuest21, a project-based learning process of teaching and learning, in a Chicago western suburban school district. The primary question was, “Is MindQuest21, a professional development approach, an effective model to change a sample of D21 teachers’ pedagogy from traditional to project-based learning approaches?”

Observations, interviews, and survey data were collected and analyzed to determine the effectiveness of the initial professional development experience and subsequent implementation efforts. Both successes and challenges were examined in order to learn and improve the effectiveness of the model.

It was also imperative to address additional related questions in order to establish a solid foundation for the answer to this primary question and ultimately examine the impact on student learning.

The related questions included:

1. How has the professional development experience shaped teacher attitudes towards readiness for PBL instructional designs?
2. How has the use of PBL helped teachers integrate 21<sup>st</sup> Century skills, CCSS, and technology tools into lesson planning design, delivery, and assessment?
3. What were teachers’ perceptions of how students benefited from project-based learning?

In this chapter, I provide a synthesis of the findings as related to the research questions above. Recommendations for this district, and other schools and/or districts



preparing to transform their pedagogy and curriculum focus via the findings of this research process are provided.

#### Primary Research Question

*The primary research question was, “Is MindQuest21, a professional development approach, an effective model to change a sample of D21 teachers’ pedagogy from traditional to project-based learning approaches?”*

Affecting sustainable, transformative, and meaningful change in any educational environment should be sensitively approached. It needs to take into account the culture, context, climate, and competence of the school community and the wide range of diversity among its members. Effective professional development begins with a strong knowledge base of the participants’ characteristics, a thorough recognition of the district and/or school vision/mission and key organizational goals and objectives, an analysis of disaggregated student attribute and performance data, insights to school stakeholder perspectives, and a clear administrative commitment.

The MindQuest21 model integrated these critical steps throughout the professional development process in partnership with the district staff. Aside from previewing all public domain data available for the district, and related school key performance indicators, many relevant conversations took place before the summer institute which included MindQuest21 staff, administrators, lead teachers, classroom teachers, and other community stakeholders. These significant conversations and collaborative dialogue centered on the most effective approach to transition the district’s pedagogical framework from a traditional model of instruction to an inquiry PBL approach to teaching and learning. This would not be another staff development event

but rather a continuous professional learning process that progressed beyond the summer institute experience and into the academic school year calendar as a sustained model of implementation support for a first-year cohort of teachers. This process included formative ongoing professional development, online support for project feedback and development, scheduled visits with several staff members throughout the academic school year to sustain high quality project development, and timely administrative and lead teacher collaborative sessions to discuss and review teacher and student growth in PBL.

Through the use of web-based technology the MindQuest21 staff provided continuous support for project design, implementation, and post-implementation feedback throughout several phases of PBL adoption. This was a vital communication venue that ensured a successful transition process for implementing teachers. They often had queries, questions, comments, and recommendations that were immediately addressed. With the rapid pace in which many schools operate, it is imperative that professional development partners be highly responsive and timely to teachers' requests during their instructional transitions. This online connection ensured an uninterrupted level of support beyond the scheduled academic calendar professional learning opportunities. This also nurtured a deeper relationship with the first-year cohort of adopting teachers and fostered a high level of internal advocacy, trust, and sustainability for the subsequent teacher cohorts scheduled for MindQuest21 PBL development in the next two years.

## Related Research Questions

*Related Question #1: How has the professional development experience shaped teacher attitudes towards readiness for PBL instructional designs?*

Effective professional development has to begin with a clear understanding of why a change is necessary. Teachers have been subjected to a wide range of professional development based on policy changes, administrative requests, student demographic accountability results, and a variety of other factors which has made them quite skeptical and distrusting of the usefulness, longevity, and commitment to new instructional programs. It is imperative that teachers value and identify with the need for change.

It is also important to understand and support how the change will manifest in the teacher's environment and support them through the complexities of this transition process. This supports the findings of Fullan & Hargreaves (1996) where they discuss the importance of the *context* of teaching. "Change is too often idealized; thought of in self-contained systems and packaged too neatly. It needs to be dealt with in ways that are much more sensitive to the real world demands of the context of teaching (p. 31)".

In addition, it is essential to any new instructional framework adoption that all perceived, and real, obstacles be addressed so teachers can easily transition their effective pedagogical strategies and student learning best practices. This can be facilitated by a re-examination of the use of time, space, and technology as invaluable resources for increased teacher collaboration, the analysis of other initiatives that either support or hinder the success of a new instructional framework adoption, and the evaluation of the worth and value of routine assessment data that may not truly measure the type of student

growth and performance that students demonstrate in a project-based learning environment.

The MindQuest21 PBL professional development model initiated the professional learning process with relevant dialogue opportunities and conversation prompts, among the participants, regarding the context of education in today's society. Addressing *why* it's necessary to approach 21<sup>st</sup> Century students with new instructional approaches was a necessary first step in order to establish a solid foundation and rationale for the change process. This rationale was further explored with relevance to their own changing community, their disaggregated student performance measures, and their individual and collective perspectives and biases.

*Related Question #2: How has the use of PBL helped teachers integrate 21<sup>st</sup> Century skills, CCSS, and technology tools into lesson planning design, delivery, and assessment?*

The participating teachers were facilitated in the creation of a project design utilizing the web-based MindQuest21 Project Overview template (see Appendix F). Facilitating professional learning through the use of the same tool they would eventually use independently, and/or with their collaborating teams, allowed them the invaluable opportunity to gain comfort, competence, expertise, and proficiency in the use of this elaborate tool and also promoted the use of technology with their students. Careful attention and guidance, through a variety of presentation and learning venues, was given to the components and expectations of each element entry. Teachers were formatively supported throughout the project design process. They were given opportunities to generate and ideate topics of interest, develop essential and guiding questions, select standards and 21<sup>st</sup> Century skills to be taught and assessed, create launch activities,

identify student team roles and responsibilities, and determine relevant skills and student outcomes. In recognition of the distinct grade level responsibilities and appropriate student developmental stages, differentiated activities were applied for primary, intermediate, and middle grade level clusters of teachers.

This learning by doing approach was well received by the participants since they were developing real project designs, in a safe environment, that would ultimately be implemented within their curriculum content. They were provided opportunities to refine, share, and reflect on their project designs. Their projects evolved through discussions among their grade level peers, presentations across grade levels and also across distinct school clusters. This process fostered a sense of community and created a high level of transparency and coherence across the district. Teachers received constructive feedback, from several perspectives, and could choose to integrate a variety of recommendations and resources for enriching overall project quality.

This also contributed to the development of a district-wide digital curriculum reference of project designs which enabled teachers and administrators to more efficiently share and improve communication of projects electronically, pre-tune and post-tune project implementations on a scheduled timeline, decrease the dependence on collaborative teacher planning time, an invaluable commodity in all schools, and effectively gauge formative and summative student learning.

*Related Question #3: What were teachers' perceptions of how students benefited from project-based learning?*

As previously stated in Chapter Four many teachers reported an increase in motivation, inclusion, and authenticity of their students' learning. Although many of the

findings for this question result from teachers' perceptual disclosures, since students were not directly interviewed, in many cases the data used by teachers to assess student gains derived from their classroom process observations and student reflection surveys administered and gathered as components of new PBL formative and summative assessment processes. Alignment of PBL student outcomes to varied internal key performance measures, as well as teacher accountability related to effective PBL design and delivery, were planned as priority components of the ongoing program implementation.

During the initial PBL implementation teachers had difficulty identifying concepts for PBL units that would be authentic to the students' lives. The MindQuest21 PBL professional development approach promoted the use of a school community survey in order to ground the big ideas, concepts, and essential questions to real-world issues, dilemmas, and challenges that resonated with the entire school community. The survey was administered, analyzed, and results gathered to determine the focus of all projects throughout the academic calendar. This was the beginning of creating curriculum directly tied to the students and their community's interests.

Grounded on authentic student interests, teachers gained more competence with PBL and began to use varied approaches to integrate both content and 21<sup>st</sup> Century skills within their project implementations. This led to more student team and leadership development, better use of technology as a learning tool, opportunities for more inclusion of ELL and Special Education students, the use of external resources and community expertise, and very importantly, new action-oriented student outcomes. Student felt

empowered to make a difference in their local and global community, using a process that facilitated their transition from passive learners to active problem solvers.

Additionally, students directly benefitted from the increased adult collaboration and attention to the many fundamental decisions being made about their educational experiences. Providing teachers and administrators opportunities to think deeply about the effectiveness of their curriculum, assessments, data and intervention processes, social emotional programs, enrichment and remediation practices, and the overall context of their school community goals and objectives, is a great place to begin the necessary conversations about what really is working in our schools for the benefit of students.

The Mindquest21 model creates an impetus for school communities to explore the core of schooling in the 21<sup>st</sup> Century. As previously mentioned in Chapter 1, as educators, our greatest challenge to improving education is to collectively agree on what it is we want our children to contribute as adults in a global society. Unless we engage in this fundamental dialogue, for the benefit of our students and their communities, we will not be moving toward the appropriate preparation they will need to succeed academically and beyond.

### Recommendations

The following recommendations support the findings of the primary and related research questions. They are presented embedded within a series of conceptual framework statements to provide a clear context to the specific recommendations. The conceptual framework categories are as follows:

- Shift from Traditional Staff Development to Professional Learning Systems
- Build Internal Sustainability for Change

- Explore Individual and Collective Belief Systems
- Move from Curriculum Delivery to Curriculum Development
- Learn through Active Experiences

Although they are organized by the responses to the primary and related questions and were based on the outcomes of the MindQuest21 program evaluation research process, within a specific district, they are not interdependent, although investment in one area will have a direct impact on another.

#### *Shift from Traditional Staff Development to Professional Learning Systems*

Effecting transformative change in a school or district requires intensive planning, data-based decision making, frequent and sustained collaboration at all levels, and a high commitment from all stakeholders. For change to be effective and enduring we should be establishing new cultures of teaching where relationships, among teachers, students, and administrators are bound together in a supportive community for continuous improvement. Many organizations invest a great deal of resources in well intended teacher education initiatives which are usually rushed in implementation, fragmented, and top-down in nature. As educators in the 21<sup>st</sup> Century, if we are to succeed in an ever-evolving context, we need to approach staff development as a collaborative and constructivist process that goes beyond reactive thinking and acting. The research on staff development by Joyce & Showers (1983) supports the constructivist view of ongoing teacher training, showing how inquiry projects, study sessions, and the selection of professional readings can create growth and change schools.



*Recommendation #1: Parallel the professional learning process to student learning.*

Introducing an inquiry-based PBL framework of instruction to groups of teachers requires that the teacher development experience be as authentic as the subsequent student learning experiences. The MindQuest21 professional development “Walk the Talk” approach utilized and formatively applied the PBL Life Cycle elements to deliver and engage teachers in the same paradigm shifts their students would eventually encounter. This process provided teachers a safe place to examine, reinvent, reorganize, and construct knowledge through active individual and team learning experiences and by linking new information to what they already knew.

*Recommendation #2: Identify ongoing professional learning opportunities for systemic and sustainable instructional change.*

Beyond the initial professional development summer institute experience all participants were supported through follow-up visits to ensure high quality implementation. Teachers met with the professional development provider(s) to review project designs, receive relevant and immediate feedback on ‘big ideas’ which led to authentic essential questions and guiding questions, discuss student team development ideas and strategies, review project goals, dialogue and examine their integration of 21<sup>st</sup> Century skills, discuss the creation of formative and summative assessments, and analyze student learning outcomes. Providing teachers with scheduled visits for consultation and ongoing web-based professional development ensured a continuous support structure that sustained the integrity and success of this transformative instructional shift.

*Recommendation #3: Encourage a process for open communication around project based learning development.*

The first-year implementation focused on identifying and organizing resources, dedicating time for necessary teacher collaboration, particularly for interdisciplinary projects that involved multiple teacher content areas, and developing an internal collaborative and cyclical process of pre-tuning and post-tuning projects in order to receive peer and administrative feedback before and after projects were executed. It is imperative that school leaders proactively identify these critical collaborative opportunities and discussion session timeframes, within the academic calendar, and plan and communicate them to their staff far in advance of the beginning of the school year. Teachers appreciate and want to know expectations and deadlines and thrive in environments of transparency and clear agendas.

*Build Internal Sustainability for Change*

An instructional framework shift affects more than classroom pedagogy. It will ultimately lead to the examination, alignment, and optimization of all available resources within a school community to ensure success. Given that the primary resource in schools is people, change in this area needs to be strategically approached with persistence, courage, evidence, and a collective agreement for what is actually working for students. If we are to meet the needs of students, we must also transform the experiences of the adults. These experiences may involve adopting distributive leadership models, creating new roles and responsibilities, building new relationships and communication structures, and in many cases, investing in new learning to support redefined roles.

Shared decision making and shared learning empowers teachers and administrators to develop common goals. Different kinds of contexts, leadership, and working relationships among teachers and their colleagues are needed if continuous improvement is to be secured.

*Recommendation #1: Identify and develop coaches, lead teachers, and/or specialists groups of teachers in effective PBL strategies.*

This transformative program implementation was further supported by identifying and developing an internal group of teacher coaches who had instructional support roles in distinct areas of expertise such as; literacy, mathematics, and technology. These coaches, who already had developed collegial relationships with classroom teachers, were further advanced in project-based learning strategies through a series of targeted PBL coaching development sessions. They were then able to formatively provide ongoing, on-site, co-sustainability of project development through their unique coaching lenses and collaborative expertise. This embedded internal process supported and increased the likelihood for success and increased improvement of school and district-wide PBL project design and implementation. In the book, *The Art of Coaching*, author Elena Aguilar states, “A transformational coach thinks in terms of systems, and directs her [or his] efforts at the levels of an individual and the systems in which we are embedded,” Aguilar, (2013).

Also, as more district staff members were scheduled to adopt project-based learning as the school/district instructional framework, this gradual release approach shifted ownership, responsibility, and accountability directly to the school community.

*Recommendation #2: Identify key areas of teacher growth through a PBL framework at all levels of the organization.*

An important component of the MindQuest21 PBL process included a clear understanding by both the administrators and teachers for what to expect in a high quality PBL implementation. Beyond the project design(s) phase, it was necessary to begin discussions and dialogue regarding the potential alignment of identifying teacher efficacy in PBL to the existing processes of supporting teachers' domains of growth and success. Being a first-year implementation it was important to remain non-evaluative, focus on support, embrace the healthy balance of evolution and failure in a learning process, and begin to establish effective methods to provide valuable feedback and timely courses of action toward a successful instructional transition.

#### *Explore Individual and Collective Belief Systems*

Teacher beliefs manifest in many ways throughout our schools and classrooms. These beliefs impact the concepts they emphasize, their expectations of the students' abilities, how they anticipate students will perform, which materials they will utilize, how they structure their instructional content and assessments, and most importantly, how they perceive their roles with their students. PBL challenges many of these core beliefs and therefore it is imperative that schools and/or districts preparing to adopt this approach to instruction address these varied perspectives and practices in open, honest, and safe settings. In a carefully designed collaborative learning venue, beliefs can be examined to proactively address the multiple actions, behaviors, and practices that derive from them. This should be further explored with reference to how the collective school mission and vision statements authentically relate to their global and local community and the overall

purpose of their organizations' goals and objectives to produce deeper student experiences.

*Recommendation #1: Encourage difficult conversations.*

As previously discussed in Chapter Two, we are living in an era of explosive demographic changes. We are also living in a rapidly expanding technological age with increasing global interconnectedness. As our world changes around us, within our schools, the cultural and ethnic similarity of our teaching force has remained comparatively stagnant. This has created significant disconnections among students, their families, their teachers, and the processes of curriculum and instruction used in schools. Since PBL focuses on promoting the investigation of authentic topics, initially prompted by teachers, it is critical to openly address the foundational beliefs, values, and behaviors that drive the goals and objectives school staff members hold in relation to social equity, race, ethnicity, biases, and other perceived controversial topics.

*Recommendation #2: Align the change process with the school/district vision/mission.*

While schools and districts have vision/mission statements the members of those organizations also have theirs. These documented words of purpose are conceived from a variety of processes that derive from a wide spectrum of consensus approaches and mechanisms. Ask a teacher or other school community member to recite the mission/vision and you'll get a plethora of responses. Revisiting the organizations' main goals, objectives, and strategies is an important and effective way to begin discussions around the way those ideals will manifest into quality instructional programs. When individual beliefs and values match organizational goals and objectives genuine and

productive transformation occurs. Miles & Frank (2008) assert: “Buy-in is most easily attained when the faculty have opportunity to jointly create the strategy and provide feedback, and when the vision adopted is one that they share.”

### *Move from Curriculum Delivery to Curriculum Development*

Increasing developments in technology, social media, changing demographics, new standards, and emerging 21<sup>st</sup> Century workforce demands have given educators an unprecedented opportunity to dramatically transform their curriculum content. Following a scope and sequence approach to teaching and learning will not engage our students in the kinds of authentic learning experiences they need or want. Traditional textbook driven curriculum has become obsolete, passive, and irrelevant to students. To continue to deliver instructional content from traditional sources without regard to students authentic interests will not yield the type of knowledge, skills, and outcomes they need to develop for success in the 21<sup>st</sup> Century workforce.

Our students live in a world of tremendous information accessibility. They are competent digital consumers who thrive on connections and discovery. Through effective student-centered PBL design and implementation teachers have new opportunities to increase their students’ potential to become effective digital producers and collaborative problem solvers. The world has developed into a more interconnected society and global issues which were once others’ dilemmas are quickly gaining local awareness and advocacy from our millennial generation. PBL provides students opportunities to learn by designing and constructing actual solutions to real world problems. These varied topics and areas of authentic student interest are the venues through which new curriculum can be developed with students as co-creators of their own learning.

*Recommendation #1: Utilize Effective Technology Tools to Facilitate Complex Instructional Shifts.*

The MindQuest21 PBL Life Cycle Overview Template is designed as a web-based tool with specific questions and prompts which place a high emphasis on the construction of deeper student learning experiences. The template was created as a Google doc to facilitate the sharing and continuous exchange of ideas and creativity from several teachers, peers, and administration. This template encouraged the use of a technology tool for productivity purposes and stimulated the same use of this type of technology for student learning purposes.

Each element in the template provided useful information for teachers to respond, either individually or collectively, to the prompts in order to ensure high quality lesson plan design and delivery. The template element questions included embedded *links* (and links within links) to various sources of helpful hints, examples, and web-based information such as 21<sup>st</sup> Century skills, several sets of standards (including the CCSS), rubrics and assessment samples, and other resources easily accessible for integration in lesson design and collaboration opportunities (See Appendix G for examples of MindQuest21 Project Overview embedded links 1-4). This template also enabled teachers to navigate independently through the expectations and thought processes required for successful PBL unit design and implementation.

*Recommendation #2: Provide safe opportunities for teachers to develop competence as PBL curriculum developers.*

The professional development sessions facilitated the optimal use of the template and explained each element and its embedded resources. This provided an on-site web-

based tool for teachers to use, build their knowledge and comfort levels, and have references beyond the professional development sessions. This tool also ensured and empowered teachers to creatively construct new curriculum, electronically share with colleagues and administrators, schedule pre and post project tuning discussions, and most importantly begin a digital library of PBL unit resources for future reference. Many teachers reported this tool as invaluable for the refinement and creation of new and ongoing projects. This also provided a vital resource to future cohorts of teachers scheduled for MindQuest21 PBL professional development and for newly hired staff members in need of concrete examples created by their colleagues and for their school community.

The MindQuest21 PBL Project Overview facilitated and ensured the successful process of project planning, design, and reflection by providing pertinent prompts, and substantial links to necessary standards' web-sites, references, and other information and cues useful for recording creative and innovative 21<sup>st</sup> Century curriculum unit designs.

*Recommendation #3: Celebrate and share PBL progress and reflections.*

At the end of the academic school year, during a scheduled teacher institute day, first year teacher PBL implementers were provided time to present their projects to their peers and administrators. This Gallery Walk experience was planned to highlight each project design and related elements, discuss implementation process successes and lessons learned, and share reflections of student work with other staff members scheduled for the subsequent year PBL cohort. In order to stay within the scheduled time parameters each teacher, or groups of teacher, presenters were given a set of reflection questions to prepare their presentation(s). This was a critical and courageous shift for teachers who



were experiencing their own apprehensions and hesitations to share work in progress.

The projects shared were exhibited through a variety of venues. Some selected to present using technology tools and also share student work, others opted for science fair types of presentation approaches and focused on their own pedagogical shifts, and some verbalized their entire experiences.

Teacher feedback documented and collected from this Gallery Walk identified areas for improvement such as; more time to go deeper in the examination of each project, more discretion as to which projects they could visit in the allotted time frame, and more examples of completed student work. Despite the limitations, this was a great first step in building a shared community for continued PBL implementation, the identification of exemplars, and district-wide awareness.

#### *Learn through Active Experiences*

John Dewey remarked in 1916, in his book *Democracy and Education*:

Why is it that, in spite of the fact that teaching by pouring in, learning by passive absorption, are universally condemned, that they are still so entrenched in practice? That education is not an affair of “telling” and being told, but an active constructive process, is a principle almost as generally violated in practice as conceded in theory. Is not this deplorable situation due to the fact that the doctrine is itself merely told? But its enactment in practice requires that the school environment be equipped with agencies for doing, with tools and physical materials, to an extent rarely attained. (p. 38)

This 20<sup>th</sup> Century constructivist theory, combined with today’s information technology, has powerful implications for transforming teaching and learning practices in our 21<sup>st</sup> Century schools through PBL approaches. Project-based learning is premised on Dewey’s concept that students must be invested in what they’re learning. If we adopt this approach for student learning we must also apply this fundamental premise to adult learning settings and create opportunities for teachers to construct, share, and develop

their new pedagogy. For PBL to be effectively adopted in classroom settings, it is essential for teachers to employ the same practices in their own learning experiences.

*Recommendation #1: Develop strategies to engage students in the change process.*

An integral component of the MindQuest21 PBL professional development was to allow time for teachers to collaborate in teams to develop ideas and share how they were planning to introduce PBL to their students. During these sessions many teachers planned, in teams, approaches to these important introductions. Teachers focused their efforts on team building and identifying which groups of students, based on specific attributes, they knew would work well in a PBL environment. This was particularly important for their at-risk populations. Teachers gave particular attention to language development strategies for ELL students and Individual Evaluation Plan (IEP) goals of Special Education students. They also explored many new rubrics they felt would work well with their project designs in order to introduce new expectations to their students and also address differentiated student social-emotional needs. Other student directed activities included identifying engaging project launch resources and appropriate technology applications that they felt would be of high interest to diverse students.

*Recommendation #2: Build a PBL curriculum mapping process.*

As project designs and implementation began to increase within each school, it was important to begin to examine the focus of each project topic by grade level and across grade levels in order to build on students' prior learning, stimulate ideas for further and deeper investigations within topics, systemically allocate limited resources, and avoid redundancy. Curriculum mapping is not new to many schools but has generally focused on content and standards' coverage. Mapping for PBL also captures content and

standards delivery but requires a closer and deeper examination of conceptual student learning, by project, with an emphasis on student outcomes and evidence of 21<sup>st</sup> Century skill development. In addition, as PBL implementation increases across schools within a district, a practical plan for technology integration and allocation needs to be in place, in advance, to properly ensure equitable and timely access for student research and presentation development needs.

*Recommendation #3: Encourage new audiences for feedback of student work.*

PBL thrives on authentic primary information and continuous feedback from external audiences and topic experts. The MindQuest21 professional development model included district dedicated (theme-based) academic calendar collaborative institute days for teachers to collaborate on project designs. Several external expert speakers were contacted and they agreed to present relevant content information to the faculty in order to increase the teachers' awareness and build their background knowledge on the topic area. These speakers shared their expertise, engaged in question and answer opportunities for the staff, and stimulated ideas for project development. This encouraged and promoted the use of community resources for teachers to use with their students. Many teachers indicated how valuable this information was to their project development and were motivated to bring external expertise during project launch activities, during student formative assessment stages, and to provide critical feedback during student summative assessment presentations. Many teachers stated that the students worked harder, took their presentations more seriously, and had more pride in their work when they knew that new audiences would co-evaluate their outcome knowledge. Some next steps for the district were to develop quarterly and end-of-year student-led Gallery Walks of project

presentations and invite several school stakeholders to share their learning experiences. Giving feedback to students is integral to improving student learning. In PBL teachers are encouraged to create cultures that support frequent feedback and assessment and encourage students to compare their work with others. They also provide students with self-reflection opportunities throughout project implementation, utilize peer feedback, and involve external content experts in assessing student performance.

### Unexpected Discoveries

As the MindQuest21 PBL initiative permeated and developed throughout the district, many teachers began to express the ease of incorporating multiple standards, complex problem solving and collaborative skills, real-world issues, and higher order thinking, within a PBL design framework, as opposed to their traditional methods of instruction. Although the teachers responded well to the user friendly web-based resources, prompts, and mechanics of the MindQuest21 PBL Project Overview template, they did not welcome the amount of planning and documentation expected in the project design. Eventually, one teacher noted, “It’s getting easier”. Another notable area of particular concern for many new PBL users was in the development of essential questions. In an ideal high functioning PBL environment the goal is for students to generate their own essential questions and learning goals. In an adopting PBL environment the goal is to teach teachers to teach students how to engage in this self-directed process. If teachers do not keep abreast of local, global, political, environmental, social, technological, and cultural changes, which have affected, currently affect, and have the potential to affect us into the future from a variety of diverse perspectives; it can

be challenging to introduce this type of teaching and learning. For many teachers, it is much safer to rely on what the textbook scope and sequence dictates.

The aforementioned district-wide survey which was designed to authentically identify concepts and themes or ‘big ideas’ for project designs, that mattered to the school community, were a challenge for teachers to adopt since they didn’t neatly fit into their curriculum sequence. As first-year implementers they complied and eventually began to find and build connections from the themes to what they considered necessary content without compromising and also addressing testing accountability material. This blended compromise is the reality of what many schools and districts struggle with in their well-intended attempts to adopt new curriculum and authentic learning experiences for their students.

### Final Thoughts

The combination of new standards, continuously developing technology, and new populations of students, has given schools and districts an unprecedented game-changing opportunity to reconstruct their *modus operandi*. The old-school way of teaching and learning is no longer effective to prepare students to thrive in today’s world. Solving highly complex problems requires that students have both fundamental academic skills combined with 21<sup>st</sup> Century skills of problem-solving, teamwork, time management, the ability to effectively synthesize varied information sources, and skilled use of technology. In addition, it is widely recognized that students’ different learning styles are based on their unique backgrounds and therefore have a broader range of capabilities than those they’ve been permitted to use with text-based driven curriculum. PBL accommodates

opportunities for optimizing these distinct learning styles and communication modalities toward relevant and engaging collaboration in learning.

Continuing to use traditional text-book driven approaches of instruction to meet, and exceed, 21<sup>st</sup> Century learning expectations with this combined set of realities will not yield success in a global economy. In fact, it will further frustrate and alienate our best educators who are competing for our students' attention with an unprecedented amount of technology access, external stimuli, social media, emerging student identities, and global connections.

Today's students should be recognized for their unique qualities as digital natives with highly diverse cultures and rich backgrounds. As educators we should facilitate their potential and place a high value on their distinct and innovative mindsets. The depth of student learning and success as citizens in a global society needs to begin in today's classrooms with challenging and authentically engaging opportunities for all students to fully participate in relevant, engaging, and challenging learning experiences which lead to identifying key issues, discovering potential solutions, and taking action on local and global dilemmas that affect our collective future.

Additionally, if PBL or other inquiry-based 21<sup>st</sup> Century initiatives are to successfully become the primary instructional framework for any school community it is imperative to identify effective communication and collaboration methods to inform and invite the varied school stakeholders' perspectives, particularly parents, during planning stages, initial pilot implementation stages, and throughout the development of the transformative process. Parents need to be an integral part of the conversations in order

to understand and advocate for the need to adopt new instructional approaches and effectively collaborate in developing new student expectations.

If the above recommendations are explored and proactively applied, the answer to the primary research question, “*Is MindQuest21, a professional development methodology, an effective model to change a sample of D21 teachers’ pedagogy from traditional to project-based learning approaches?*” is an unequivocal yes.

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## Appendix A

### MindQuest21 Teacher Letter



#### Illinois Consortium for 21<sup>st</sup> Century Schools

A 501 (C) 3 Not For Profit Organization

[www.ilc21.org](http://www.ilc21.org)

September 28, 2012

Dear MindQuest21 teacher:

How the summer has flown away! By now, you are well into the new school year with your new students. And it is almost time for our first follow-up session to this past summer's MindQuest21 Institute....with no need for floor fans! On either Wednesday October 3rd or 10th, we will meet you at the Administrative Center for your work session from 4-5:30 PM. We have two goals: (a) to review and discuss the projects you are working on with students. (b) To introduce the Level III planning format for big-idea multi-thematic PBLT units.

Here is the agenda.

4:00. A quick look back. Grade Level Teams.

4:15. Collegial Critiques: Project Sharing Time with plans, artifacts and assessments.

(Protocol: What worked? What Questions? What refinements?)

4:45. Preparing for a Level III, Multidisciplinary Thematic Project.

5:25 Closure.

5:30 on the road.



To prepare for this time, it will be helpful for you and/or your team to bring the following:

- A. Sharing Your Projects. (finished or in progress)
  - a. Your plan.
  - b. Samples of student products (artifacts). (E.g. completed samples of graphic organizers, RTW interactives, journal entries, assessments, final product, etc.)
  - c. Your PBLT self-assessment of the project and any questions.
  
- B. Think-Abouts for preparing a Level III project multi-disciplinary PBLT unit.
  - a. What theme or big idea (e.g.: Sustainability, Our Family, Our Community, etc.)? Why is this theme important for your students?
  - b. Organization: ☐ Game (i.e. Scavenger hunt, People Search) ☐ Digital media (i.e. digital story, smart phone investigation) ☐ STEAM (science, math, ela, arts and technology)
  - c. Included disciplines?
  - d. Time frame. Number of weeks. Time per day.

We are looking forward to hearing about your progress implementing Project-Based Learning Technology Units in your classrooms. What went well? What needs polishing? What questions do you have? We are also eager to start the first step in helping you move to the most complex level with full blown, capstone PBLT units.

Sincerely,

James Bellanca,  
Executive Director,  
Illinois consortium for 21<sup>st</sup> Century Schools  
Ilc21.org

## **Appendix B**

### **Survey Questions**

Likert Scale Questions: (to be formatted either through survey monkey or paper pencil)

Strongly Agree - Agree - Slightly Agree - Disagree - Strongly Disagree

1. I have a high understanding of Project Based Learning (PBL).
2. I currently use technology as an integral part of my *teaching and learning* discipline.
3. I have adequate access to tools, time, and space for PBL approaches in my classroom.
4. I feel that curriculum accountability does not allow for enough PBL approaches in my pedagogy.
5. I have a high understanding of the Illinois Common Core State Standards as related to PBL.
6. I feel prepared to introduce PBL with a Common Core State Standards focus.
7. I have a full understanding of 21<sup>st</sup> Century skills.
8. I feel confident and proficient to implement PBL with technology in my classroom.
9. I value the use of PBL integrated with technology to improve instruction.
10. I feel supported by my administration to implement PBL in my classroom.
11. The culture of my school encourages and supports PBL.
12. I am comfortable using online tutorial programs.
13. I integrate digital curriculum as part of my lesson planning options.
14. I currently use computer-based assessments for data-driven decision making.
15. I am familiar with and use authentic assessments in my curriculum.
16. I am proficient with assessment rubrics.

17. I have facilitated project management in my classroom using technology.
18. I currently use interdisciplinary project-based teaching and learning models.
19. I use PBL and technology to differentiate and individualize learning to support student mastery of core academic content and 21<sup>st</sup> Century skills.
20. In my district professional learning communities use technology infrastructure and instructional tools that enhance 21<sup>st</sup> Century skills.

## **Appendix C**

### **Teacher Interview and Focus Group Questions**

Administration Procedures: The researcher will review the purpose of the interview with each individual teacher, which is to examine the effect of the first MindQuest21 professional development and its implementation within their classrooms throughout the academic school year. The researcher will provide assurances of confidentiality.

Teachers will be informed that the interview session will last for approximately one hour.

The questions asked will be a series of pre-established questions with a limited set of response categories, some questions will be open-ended.

#### **Background Questions:**

1. How long have you worked in education? Describe, if any, your position(s)?
2. How long have you worked at D21?
3. What grade/subject do you teach?

#### **MindQuest21 Professional Development:**

4. What was the most important part of the summer MindQuest21 Institute for you?
5. How has your participation in MindQuest21 affected your teaching practice?
6. How have your students reacted to being taught within a PBL framework?
7. Has teacher collaboration content dialogue changed amongst your team? If so, how?
8. How many PBL projects did you and/or your team plan and/or implement?
9. To what degree did district/site support help/hinder you with your implementation? How?

#### **Implementation Process Questions:**

10. When and for which content did you implement PBL?
11. What were your and, if applicable, your grade level team challenges in the implementation?
12. Did your classroom environment change due to PBL?

13. Did you integrate 21<sup>st</sup> Century skills and CCSS in your implementation?
14. Do you have a better understanding of the CCSS? How did your work with PBL help your understanding of CCSS and 21<sup>st</sup> Century Skills?
15. What evidence can you give for your PBL work producing improved 21<sup>st</sup> Century skills and deeper learning in your students?
16. How were you able to address interdisciplinary standards within your projects?
17. How did you assess your PBL units of study? How do you compare the results with those gained in previous years without PBL for this unit?

Post Implementation Questions:

18. What areas of content could be improved in the MindQuest21 Institute?
19. If attended, how helpful were the follow up meetings with the consultant team?
20. Why do you think some who attended the Institute did not follow up with a plan or with implementation?
21. What added or different follow-up services from the district or site leaders or consultant team would help you with planning and implementation of PBL units?
22. How many additional PBL units do you think you will add to your repertoire?
23. Was the duration of MindQuest21 Institute sufficient for your implementation readiness?
24. How were you able to help other non-Institute attending teachers adopt PBL?
25. How would you encourage others to learn more about PBL?
26. Do you plan to seek further professional development endeavors in PBL?
27. How much do you agree with the district's thrust for 21<sup>st</sup> Century Skills and PBL?
28. What do you think it will take to make this thrust fully successful in the district?
29. To what degree are you willing to provide additional help in your school or in the district to advance this thrust?
30. Is there anything you would like to tell me regarding MindQuest21 PBL that we haven't already discussed?

*Thank you for participating in this research study. Data collected from this survey will remain anonymous and utilized solely for the purpose of dissertation research.*

## **Appendix D**

### **Superintendent Consent Letter**



**Illinois Consortium for 21<sup>st</sup> Century Schools**

May 1, 2012

Dr. Connie Moore  
Superintendent of Schools, Progressive School District 21  
100 N. Main Street  
Western, Illinois 60100

Dear Dr. Moore:

On behalf of the Illinois Consortium for 21<sup>st</sup> Century Schools, I want to thank you for allowing us the opportunity to work with your district staff, administrators, and teachers on this very important project.

We have been thrilled to work with Ruth Olive, Assistant Superintendent for Teaching, Learning, and Accountability to plan, coordinate, and design the Mind Quest 21 Institute implementation to benefit, enhance, and optimize the current and continuing efforts already in place within the Progressive School District 21.

Mind Quest 21 is an innovative Common Core State Standards (CCSS) aligned solution which provides Illinois students, teachers, and school communities with a rigorous professional development experience which integrates technology, the 4C's, critical thinking, creativity, communication, and collaboration skills, CCSS, and their curriculum via inquiry driven Project-Based Learning (PBL).

We will be working with approximately 68 volunteer teachers from the four elementary schools within your district. This implementation will begin with an administrator's work session on June 5<sup>th</sup>, 2012 and continue with a four day teacher institute, scheduled for July 16<sup>th</sup> through July 19<sup>th</sup>, 2012. It will focus on preparing teachers to revise current curriculum to complement an innovative and enriched project-based learning model. Teachers will be guided through a design of a minimum of two projects to be implemented with their students in the 2012-2013 academic school year.

Follow-up support sessions have been planned to occur at the school sites in September, October, December, and April. We are looking forward to showcasing student projects and artifacts at the end of the project and also begin a PBL on-line network.

The project evaluator will be Deborah R. Esparza. With your approval, she will be examining the innovative professional development design. Her assessments will include teacher interviews, classroom observations, a pre-implementation and post-implementation participant survey, and potentially formative focus group sessions. This program evaluation will be a dissertation study through National Louis University and will also provide invaluable feedback and insights to not only the faculty of the Progressive School District 21, but also to the general field of knowledge, for project-based learning models which integrate CCSS, technology, and the 4C's to appropriately prepare teachers to address student effectiveness, engagement, and a very special chance to prepare to live, learn and work in the 21<sup>st</sup> Century.

If you have any further questions or comments please feel free to contact me at (847) 835-2149.

Respectfully,

Jim Bellanca  
Executive Director,  
Illinois Consortium for 21<sup>st</sup> Century Schools  
310 Keystone Court, Glencoe, Illinois 60022  
[www.ilc21.org](http://www.ilc21.org)

## Appendix E

### Participant Consent Letter

Thank you for agreeing to participate in this study. This form outlines the purposes of the study, provides a description of your involvement, and rights as a participant.

I consent to participate in a research project conducted by Deborah Rosalia Esparza, a doctoral student at National-Louis University located in Skokie, Illinois.

I understand that this study is entitled A First-Year Implementation of MindQuest21: A Project-Based Learning Paradigm Shift to Deeper Learning Outcomes with 21<sup>st</sup> Century Skills Aligned to the Common Core State Standards.

The purpose of the study is: (1) to evaluate the effectiveness of MindQuest21 PBL professional development (2) to examine the formative process of teacher practice in a student-driven PBL implementation (3) to provide insights for organizational priorities, opportunities for diverse learners, deeper learning, sustainability, advocacy, and a sense of urgency for curriculum reform.

I understand that my participation will consist of one interview lasting 45-60 minutes in length. I understand that I may receive a copy of my transcribed interview upon request.

I understand that my participation is voluntary and can be discontinued at any time without prejudice until the completion of the dissertation.

I understand that only the researcher, Deborah Rosalia Esparza, will have access to a secured file cabinet or vault in which will be kept all transcripts, taped recordings, and field notes from the interviews(s) in which I participated.

I understand that the results of this study may be published or otherwise reported to scientific bodies, but my identity will in no way be revealed.

I understand that in the event I have questions or require additional information I may contact the researcher: Deborah Rosalia Esparza, 6701 N. Dowagiac Avenue, Chicago, Illinois, 60646, (773) 747-1738, Email address: [dresparza1@gmail.com](mailto:dresparza1@gmail.com)

If you have any concerns or questions before or during participation that you feel have not been addressed by me, you may contact my Primary Advisor and Dissertation Chair: Dr. Norman Weston, National Louis University, 5202 Old Orchard Road, Skokie, Illinois, 60077, (714) 624-4711, Email address: [tedpurinton@gmail.com](mailto:tedpurinton@gmail.com)

Participant Signature\_\_\_\_\_Date\_\_\_\_\_

Researcher Signature\_\_\_\_\_Date\_\_\_\_\_



## Appendix F

### Sample MindQuest21 Project Overview – (pg. 1)



Illinois Consortium for 21<sup>st</sup> Century Schools

#### MINDQUEST21<sup>st</sup> PROJECT OVERVIEW

The MindQuest<sup>21</sup> Project Overview is used for designing a complete PBL project, acting as the central repository of the thinking and planning that has been done in advance of project implementation. It is a living document that is revised over time to reflect improvements to the design.

When completing the Project Overview, clicking on any of the “?” will provide details about the ideas and information to be captured in that particular section of the document. **All information you capture in this document is to be entered in the white area *below* each of the shaded boxes.**

Project Name:

Teacher(s):

Grade Level:

Subject(s):

Duration (school days):

1. Big Idea ? [This section includes the standards used]

2. Essential Question ?

2a. Guiding Questions ?

3. Launch ?

4. Gather Information ?

## Appendix G

### Sample MindQuest21 Project Overview Links (1- 4)

#### 1. ‘Big Idea’ link (?)

The MindQuest21<sup>sm</sup> PBL “Big Idea” is the initial step in planning an overall project, and defines the overall framework for the project. As you plan, consider targeted standards, student relevance and interest, 21<sup>st</sup> Century learning goals, and available resources.

- Briefly summarize your project idea.
- Describe what students will know (content) and do (skills/process).
- Which standards are you including in this project (include identifiers and descriptions)?
- How will this project address the students’ distinct cultures?

As you become more skilled with PBL project design and implementation, consider collaborating with one or more of your colleagues on a multidisciplinary project. These more complex projects best emulate real-world situations, and are the most appealing to students.

Common Core State Standards:

<http://www.corestandards.org/read-the-standards/>

Next Gen Science Standards:

<http://www.nextgenscience.org/next-generation-science-standards>

National Core Arts Standards:

<http://www.nationalartsstandards.org/>

WIDA Standards:

<https://www.wida.us/standards/eld.aspx>

Article further explaining Big Ideas:

<https://iteachu.uaf.edu/online-training/develop-courses/planning-a-course/understanding-by-design/>

#### 2. Essential Question link (?)

Essential Questions should come from a variety of stakeholder voices. They are open-ended; broad enough to require true inquiry; narrow enough that the project is manageable and fits within the timeframe allotted; and provide opportunities to develop further guiding questions to structure a complete assessment process.

Note: As teachers and students become more familiar and comfortable with this process, students become more active in helping with/defining the essential questions.

Include your Essential Question in this section, followed by answers to the following questions?

- How does the Essential Question grab the students' attention and also represent the Big Idea?
- How does the Essential Question provide for student voice and choice?
- How is the Essential Question relevant/authentic to the learners?
- How does the Essential Question require students to conduct true inquiry?

Crafting Essential Questions

<https://docs.google.com/document/d/1lwv49U5sHIFWtSX-ln1nGP-pHdztqIBNUsFdi-MYLAo/edit>

Article further explaining how Essential Questions are derived from Big Ideas:

<https://iteachu.uaf.edu/online-training/develop-courses/planning-a-course/understanding-by-design/>

## 2a. Guiding Questions link (?)

Guiding questions are used to create a framework to direct student inquiry in a way that responds to the essential question. Although the teacher may pre-plan a series of questions, whenever possible the students should be asked to create their own guiding questions. This can be done using strategies such as asking students “what do you need to know in order to answer the essential question?” When students are actively involved, they feel a greater sense of ownership of their learning, and are generally more engaged in the inquiry.

When completing this section of the Project Overview, please respond to the following questions:

- How do the guiding questions provide a framework for answering the Essential Question?
- How will these questions guide student learning to result in answering the Essential Question?
- How do the guiding questions lead to deeper learning?
- How will these questions allow for formative and/or summative assessment?

## 3. Launch link (?)

An entry event, or launch for a MindQuest21<sup>st</sup> PBL is the initial activity that captures students’ attention and stimulates their interest to learn and explore further. A launch’s purpose is to “hook” the students and pique their interest.

In completing this section of your project overview, include answers to the following questions, as well as any additional information that explains your thinking:

- What activity(ies) will you use to launch the project?
- Why this activity(ies)?
- What role will students have in this launch activity?
- What outside resources did you consider or include in the launch?

Below is a short video which explains the purpose of an entry event:

What an entry event is - sock puppets (0:14)

<https://www.youtube.com/watch?v=XtkA22tYUmg>

For examples of ways entry events/launches have been done, refer to the following resources:

#### **Elementary/Intermediate**

Dance Routine - 1st Grade (2:27)

<https://www.youtube.com/watch?v=nHnORsqa35Q>

Third Grade: Animal Adaptation (2:03, no tech)

<https://www.youtube.com/watch?v=TTYAhqorPLA>

Elementary: Fundraising - video challenge (0:53, no tech)

<https://www.youtube.com/watch?v=a7-KpR05LRA>

Any Age: Art to unify community (1:29, low-tech)

<https://www.youtube.com/watch?v=Qf2ZpKrH81M>

#### **Middle School**

Say Something! - literary analysis, high school (5:15)

[https://www.youtube.com/watch?v=U\\_WYmO4G9Ew](https://www.youtube.com/watch?v=U_WYmO4G9Ew)

Middle School: The Gender Project (3:23, no-tech)

[https://www.youtube.com/watch?v=4ODRM\\_12bMI](https://www.youtube.com/watch?v=4ODRM_12bMI)

Sixth Grade: Courage (1:16, low-tech)

[https://www.youtube.com/watch?v=Q\\_d0mo6rXU8](https://www.youtube.com/watch?v=Q_d0mo6rXU8)

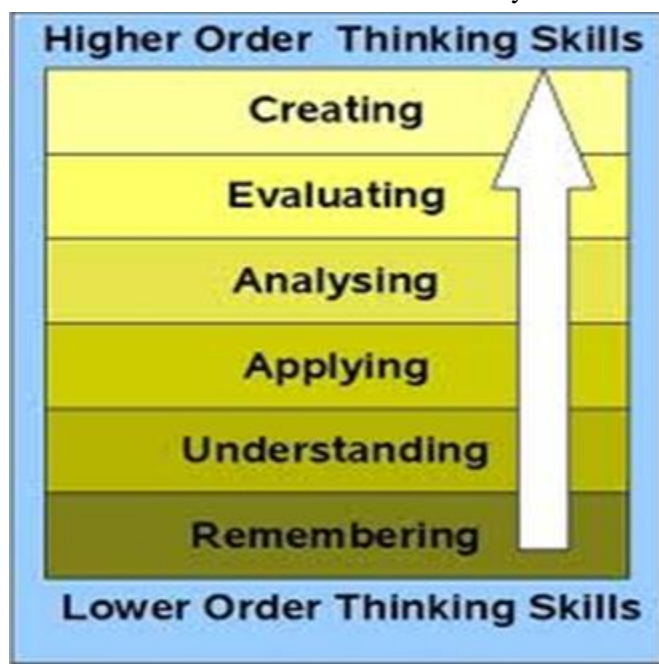
Middle/High School: "Simmigrants" (4:16)

<https://www.youtube.com/watch?v=4-QnhpjznqE>

#### 4. Gather Information link (?)

When planning the structure for students to gather information related to the essential question, consider the following:

- What are the main sources of information the students will use?
- How much choice will students have in the information sources they use?
- What exemplars will the students have for reference?
- Which higher order thinking skills will be encouraged throughout the development of the project?



## Appendix H

### Completed Project Report

WWW.ILC21.org

MindQuest21<sup>tm</sup>

**Project Title:** American Revolutionary War Museum – created by the 5<sup>th</sup> grade students at Abraham Lincoln Elementary School in Western, IL; Project designed by Librarian, Cecilia White in collaboration with Gifted Specialist, Nancy McCaffrey and 5<sup>th</sup> grade teachers – Brian Pindar, Patti Harte-Naus, Ed Klingberg and Kim Mason

**Background Information:** Throughout the school year, I have been working with the 5<sup>th</sup> graders on research skills, particularly with Internet Searching. We have sought information using a variety of websites and have worked on note taking skills. We have looked at what makes a site credible and whether or not we can trust the information given on that website. We used the RADCAB method to evaluate the credibility and accuracy of websites. I have met with the 5<sup>th</sup> grade team 4-5 times in laying out this project and Nancy McCaffrey and I have collaborated in multiple meetings to create this museum project. Nancy has been a big help since she has done numerous PBL projects over the years. Finally, I did speak to the director at the Western historical society to gather up further ideas for our museum. Through my discussion with Jan Shupert-Arick at the historical society, I discovered 2 things. First, we had to edit our original topics to include more topics about the causes of the war and second, we simplified our exhibits. Instead of trying to create a whole museum through the students' work, we would simply have each group do maybe one exhibit, even if it all didn't come out to a complete museum.

**Essential Question:** What impact did my revolutionary group/revolutionary event have on the war?



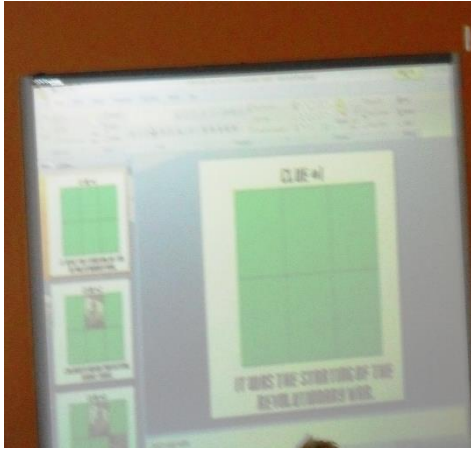
**Phase 1:** From the first week in March, the kids chose 3 of their top choices for topics. Then, the classroom teachers placed them into groups with other students to work on their topic. The students had 3 weeks to gather their research on the topic. Then, they created at least one exhibit to present to the 5<sup>th</sup> grade class.

Some chose to do a slide presentation in PowerPoint or PhotoStory; some chose to create a video through iMovie; some chose to

create the actual layout of the museum exhibit or a physical display or they chose to create a game either through technology (PowerPoint, etc...) or a board game; There were a number of students working specifically on the Trial of the Boston Massacre. These students were apart of Nancy McCaffrey's Gifted class (playing the British Soldiers) and four other children from each of the four 5<sup>th</sup> grade classrooms (playing witnesses, judge, etc...) The rest of the kids worked in groups during their library class to create a few museum exhibits on their specific Revolutionary War event or topic.



**Phase 2:** After Spring Break, the children spent most of April creating their presentations. I brought in our Tech Director, Christina Kellam to assist with the technology. Mrs. Kellam offered 3 separate lunchtime tutorials introducing the students to PowerPoint game templates, using PhotoStory to create slide presentations and showing them examples of iMovies. Then Mrs. Kellam and I worked with the children 2-3 days each week during lunch assisting them with creating their projects. The students also worked during their library classes



to create their museum exhibits. Many of the children worked very long and hard in school and outside of school to create a few projects for their museum exhibits.

**Phase 3:** Finally, the children attended the Lincoln museum in early May. The students were given a reflection form to use as they went through the Lincoln

museum. The main question was do you have any other ideas or exhibit? Each classroom gave their May 14<sup>th</sup>. The classroom teachers presentation and each student was



after seeing the Lincoln Museum thoughts that would improve your final presentations the week of were there for each group's given a grade on their

presentation. Then the following week, I invited Jan Shupert-Arick, the director from the Glen Ellyn Historical Society to hear the best presentations from each of the 4 classrooms and to give her feedback to those students.

**Teacher Reflection:** I think this was a very memorable project for my 5<sup>th</sup> grade students. About 99.99% of the students were very engaged in this project and had a lot of fun creating their exhibits. Since the children invested so much time in creating their exhibits, I think they really learned a substantial amount on their Revolutionary War event or Revolutionary War group. However, since so much time was devoted to the creation of the projects, the kids' presentations fell short. Being my first experience with doing a PBL of this magnitude, I really think that I "blindly felt my way along" this project. I was not as organized as I would have liked to have been with this project. I know that with a PBL, the essential question should be the main focus all the way through the project. However, I started out with a different essential

question then I ended up with and it wasn't until the last 3 weeks of the project that I even directed the children to answering the question.

**The Positives:** I am glad that I got our district tech director, Mrs. Kellam involved with this project from the very beginning. She was a tremendous resource and was able to fill in where I fell short in my knowledge of technology. I was also happy to offer multiple weekly lunch time sessions for the children to utilize the resources of our library and lab. It was unfortunate that this project was done within the constraints of a fixed library schedule. However, these lunch time sessions gave the kids "a taste" of how the 21<sup>st</sup> Century school library works with its flexible ebb and flow to learning. I was glad that I had Nancy McCaffrey as a PBL resource. We worked collaboratively in creating this project and she was also my connection to the Glen Ellyn Historical Society. It was nice to bring in a museum curator through Jan Shupert-Arick. She provided some real-life work experience for our students.

**Improvements for Next Time:** Well, next year, I definitely would like the classroom teacher to work more collaboratively with this project. I also would love to have this develop into "A Night at the Museum!" It's unfortunate the parents did not get to witness their children's hard work. I really would like the children's work to be on display for the whole school to see. Also if this is truly to be a REAL PBL, then I would like there to be some more real-life experiences added in. It would be great to communicate with a "school across the pond." What is taught about the Revolutionary War in Great Britain? Let's utilize not only the written word, but also the oral word of our British friends. We got a taste from the British Perspective group of the British side to the war, but wouldn't it be neat to actually hear what our British peers learn about the Revolutionary War today. Finally, it was my plan all along to connect with an actual historical museum that could possibly bring these kids' ideas to fruition. I really wanted to connect with the National Park Service or the Smithsonian Institute and see if our



students could present their museum ideas to someone who could make this museum really happen.

**Final Thoughts:** It has always been my dream to be a great educator. I became a librarian because as I reflected on my learning experiences, I saw how it wasn't the worksheets or text books that made an impact on my learning, but rather the projects! As the children invest their time, talents and passions into their learning experiences, they will grow. Children must take responsibility for their own learning if they are to learn and in essence, transform this world! As a librarian one of our greatest statements is "One can become the smartest person on the face of the earth, if they just know where to find the answers." Most of us were not born with photographic memories. We can't retain every single fact we have ever learned. However, we do truly have the potential to be great intellects if we can just tap into the resources. I am so grateful in this day and age, that we as educators have finally come to the place of seeing the great potential in each and every student who sits before us. May every child know that they were born onto this earth for a specific purpose. No life is trivial and truly children are our greatest natural resource! Project Based Learning is an instrument that can tap into that natural resource and develop it to the fullest. Our children may start out as little chunks of coal, but through the experiences of Project Based Learning, children can develop skills that will expose them to the time, pressure and yet enjoyment of learning that will transform them into diamonds!

## **Appendix I**

### **Completed Project Report**

WWW.ILC21.org

**MindQuest21<sup>tm</sup>**

**Project Title:** Animal “Heroes or Villians”

**Creator:** Ashley Furlane

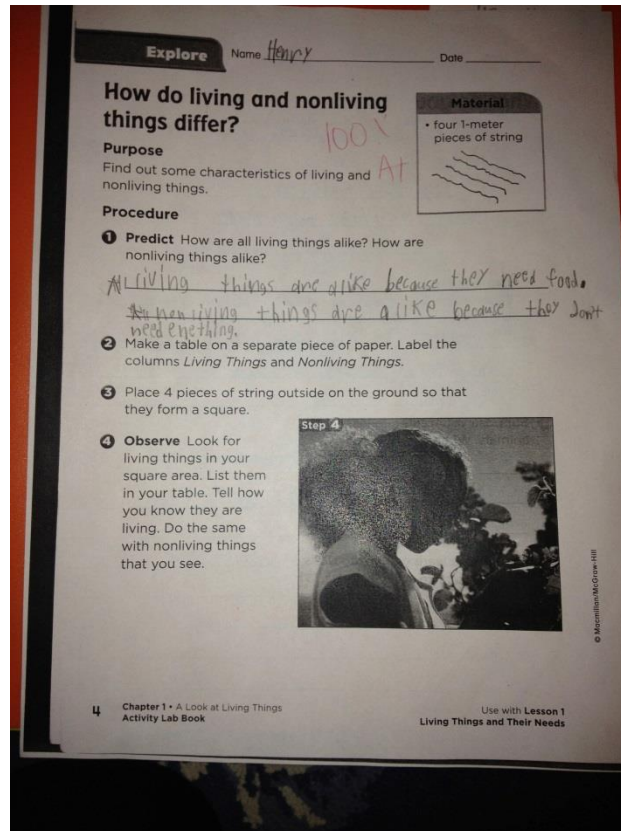
**School:** Western Intermediate School

**Background Information:** The project was completed by a heterogeneous group of 3<sup>rd</sup> grade students with an ELL cluster at Westchester Intermediate School. Each year students learn about living and nonliving things, as well as plants and animals. This year we used the PBL model to approach learning in a different way. The project was completed during science time, which is about 30 minutes a day with a larger block of time on Fridays. Before beginning the unit, I planned out minilessons to help my students be successful. The lessons included how to write a friendly letter, how to use Kidsblogs, what a community is, how to work in groups, what the listening and speaking standards are. To kick off the unit, I reminded the students about what PBL was and launched the unit. We brainstormed a list of guiding questions we felt were important to answer throughout the unit. Students were divided into cooperative groups with the help of the teacher. Students worked in these groups throughout the whole project. The power standard was the Illinois Science Standards 12 B Identify physical features of plants, animals that help them live in different environments. (Other Science Standards were 11, 12, and 13. Common Core Standards: Reading Informational Text, Writing, Listening and Speaking. Illinois Social Emotional Standards were also incorporated.)

**Essential Question:** How are plants and animals interdependent with humans and their environment? The question was formed using the model of the PBL Unit Plants and Worms developed by Denver Green School. The Illinois Science Standards and WIS 3<sup>rd</sup> grade scope and sequence drove the unit and formation of this question.

**Phase 1.** Gathering Information: How done and what happened.

After we determined our essentials questions, students worked in groups gathering research and completing experiments to gain background knowledge through inquiry. We started off by discovering the difference between living and non-living. In groups, students used books to research about the characteristics between living and nonliving things. They used chart paper to compare and contrast the two. Groups then shared their findings and adding up to their charts after learning from their peers. After the initial research, we took it outside to observe living and nonliving things in their natural environments. While observing students used the scientific process to hypothesis, observe, and draw conclusions. (See photo below.)

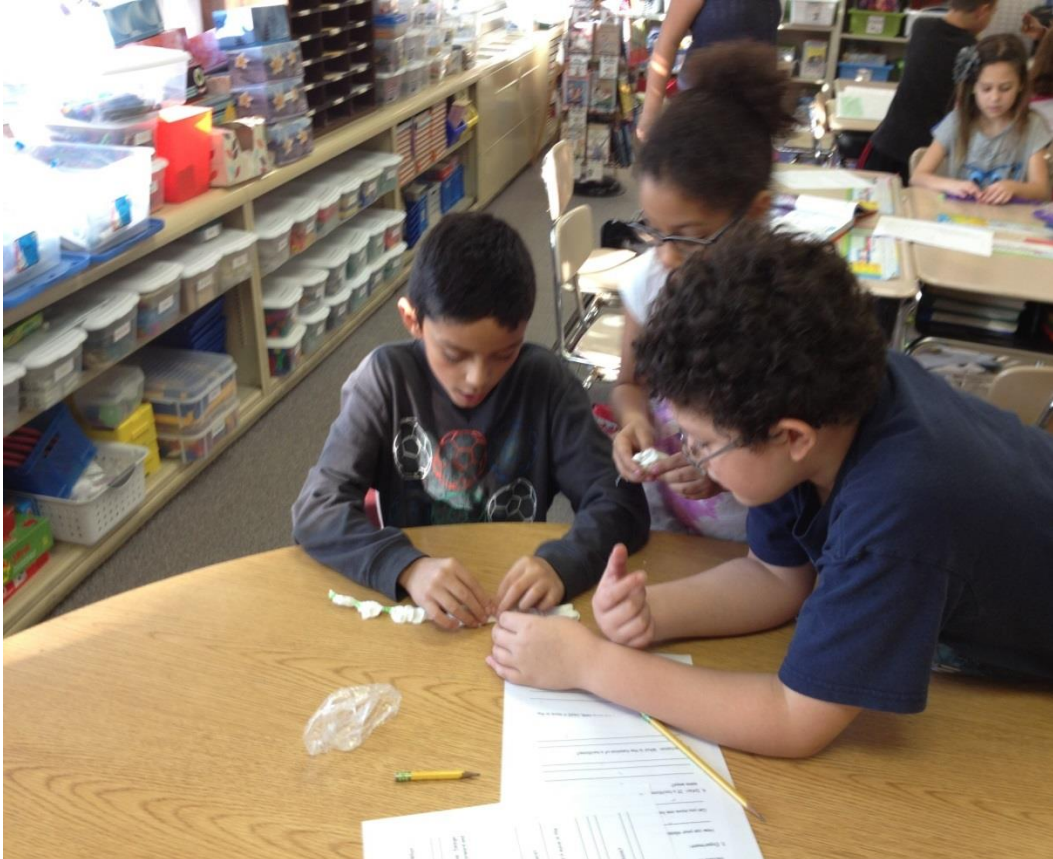


Once we learned about the board categories of living and nonliving, we focused in on the plants and what they were all about. In doing so we wanted to answer the question: What are plant structures and their functions? To answer this question, groups of students researched using the Internet and books to find diagrams, which explained plants and their parts. They also experimented using a celery stalk to find out how water moves throughout a plant. Again using the scientific process and a lot of problem solving and collaboration!



After plants, we were on to the wonderful world of animals! Our goal was to learn how are animals classified, what were their structures, and how did they affect their environment. Teams started off by determining how to classify groups of animals. Some groups really took an interesting approach on classifying the animals, which is the beauty of the inquiry model! Then the terms vertebrates and invertebrates were introduced and it was their challenge to find out what the terms meant and how they were related to animals. They used book and Internet resources to find out make a Chart compare and contrast the two groups and again the information was shared to the group. At the end we had fun applying what we learned by creating vertebrate models (See below). The students loved this hands on approach to learning!!

After we tackled all the initial guiding questions the groups were ready to hone into their final product. To start, they needed to answer a few guiding questions and focus their research into their specific question. In order to do their groups worked together to come up with which plant or animal they would like to research to determine if it was a hero or a villain. We completed some research mini-lesson on what is a reliable Internet source and what keywords to use when search the web. I also provided some websites to get the groups started, as well as some books from the school library.





Quick Lab: Model of a Backbone

9270

A-

1. Observe: Look at the photo of the raccoon on page 54. What does its backbone look like?

It's like a chain

2. Use pipe cleaners and clay. Make a model of a backbone. Design your model so that it can bend from side to side and forward and backward.

LVIS

3. Experiment:

How can your model move?

It can bend

Can you move one bone without moving all the others?

Yes

4. Infer: If a backbone were one solid bone, could it move in the same ways?

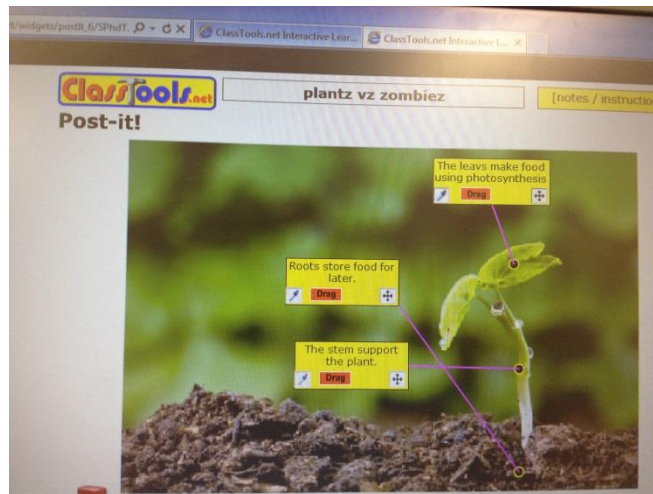
No! because it's too hard to move food!

5. Conclusion: What is the function of a backbone?

to hold your back straight up. (and move too!)

**Phase Two:** Making Sense: How done and what happened.

Along the way we made sense of our research and information that was gather with a few mini projects. After teams found out about plants and their functions, they used ClassTools to create a Post-It Note of a diagram of a plant. Here they were able to organize the knowledge learned about plants. When learning about different types of plants, groups created life cycle posters in which they presented to the class. This allowed the groups to get a closer look at certain animals they may be interested in for their final project.

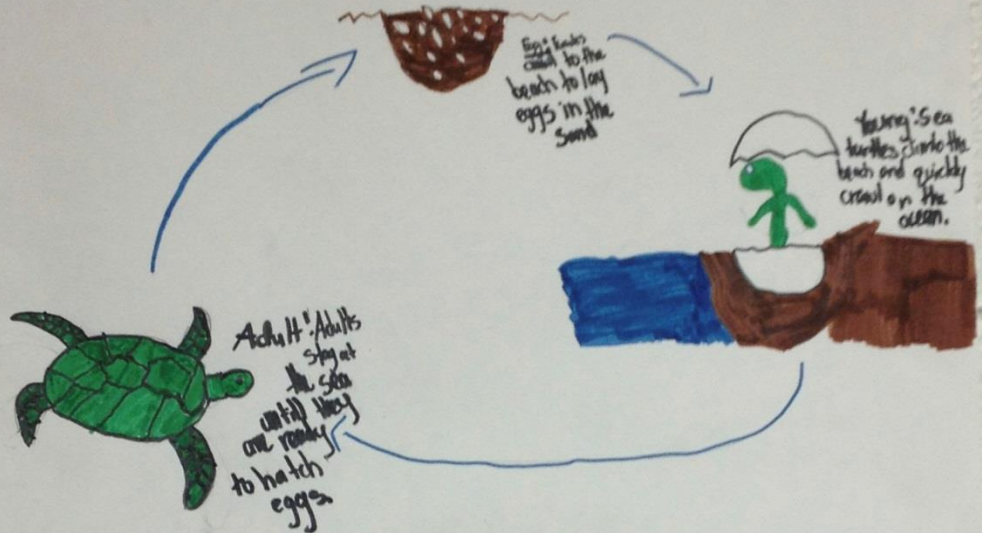






By: Eleanor Tsamary and Tony

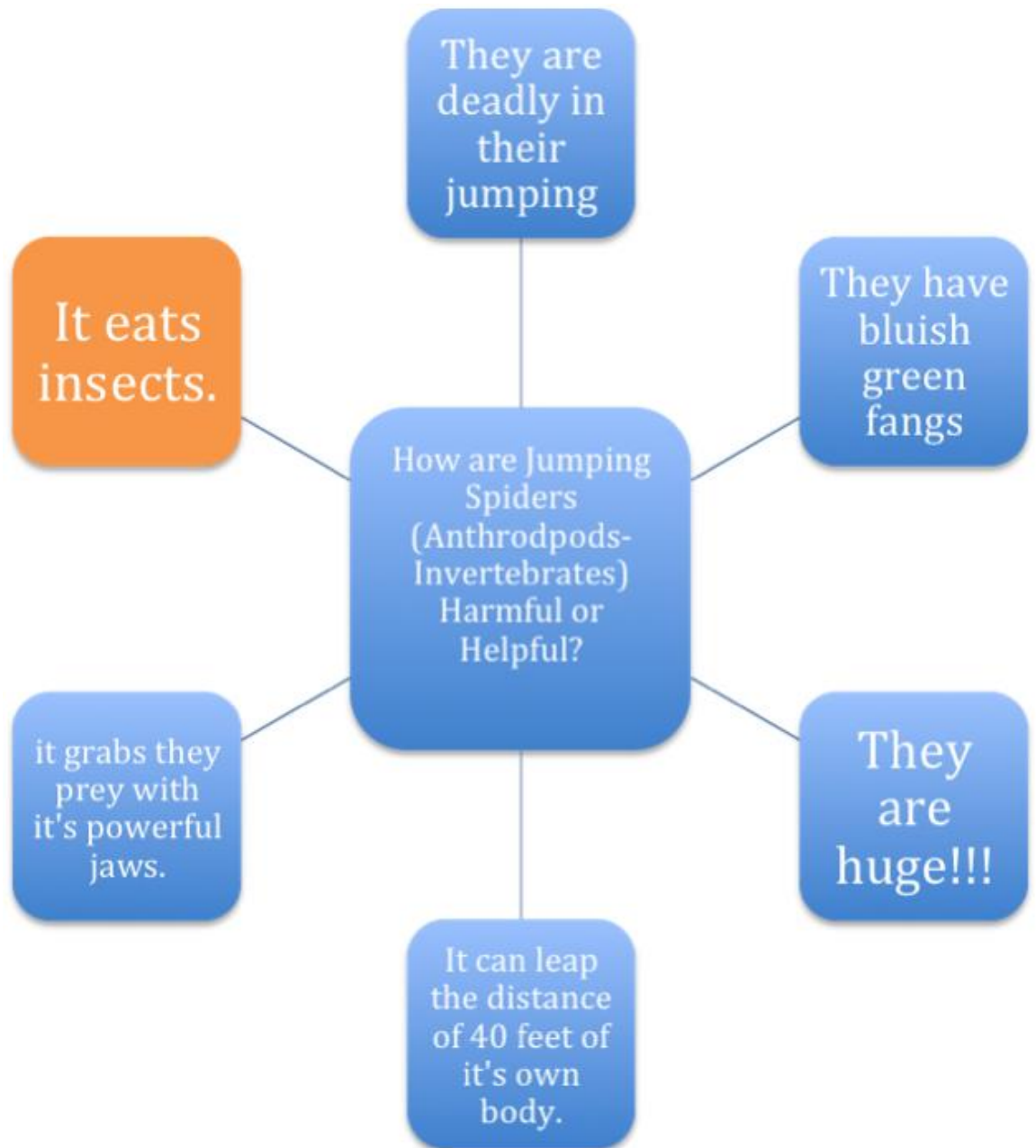
# The Life Cycle of a sea turtle



# Life cycle of a Dog.



The final project was organized using a paper organizer first. (See below) Then they transfer the information into a computerize concept web. Students also used KidBlog to collaborate learned information. (They loved this of course and did a pretty good job staying on topic, even though it was a new novelty to them.)



**Orange = helpful Blue = harmful**

### **Phase 3.** Communicating: Describe Product and Presentation

After gathering information and making sense what the groups learned to was time to tie it to the essential question using creativity, higher order thinking, collaboration and problem solving! Initially I gave groups a menu of projects, which they were working towards. The choices included an interview in the voice of the animal to explain how it is a villain or a hero,

making a play about how the animal is a villain or a hero, creating their own version of “The Diary of a ...”, creating a poster or flier promoting or warning the community about the animal, or another teacher “okayed” idea. Several groups opted for the “Diary of a...” some of the groups used the traditional pencil and paper, while others choose to use PowerPoint to tell their story. This type of project invited to bring their writing voices out in a creative way. It was amazing to hear what they came up with and they were excited that it wasn’t reporting the information. One group scripted a play about terminates which was really impressed me! They stayed focused on the essential question, but were able to put humor and character, which allowed them to express their theatrical sides. It was a crowd pleaser. The other groups choose to create posters to warn the community about the animal they choose. They were able to visually answer the essential question. One of the groups also did a poster, but I had trouble guiding them away from a traditional poster of straight facts. When they saw other groups present light bulbs went off though! I know that in the next PBL unit they will show more of their creative sides. The presentations were probably my and the students favorite parts. Before they presented we did a few mini-lessons of what a good presenter looked like. I displayed the Common Core Listening and Speaking Standards and we analyzed those and what they look like in our classroom. We modeled and practiced. We also watched some good speeches on YouTube and pointed out the standards the speaker hit. Then it was show time for the kids. They had time to rehearse before and we talked about that this is how good presenters prepare. (See below)Some were nervous and some were proud, but they all got in front of the class and showed me their best work. Was it perfect? No! But I was able to video record it so we can talk about improvements for the future. (See below)



As far as assessment, the groups and I both played a part on determining their grades. They graded their group members throughout the process using rubrics (See below). I used some assessments from our Science series, which the kids did great all, even though we didn't follow the book and used PBL instead. The project and presentation was assessed using a rubric as shown below.



# Animal "Heroes" or "Villians" Project and Presentation Rubric

Name: Arianna

CATEGORY	5 points	4 points	3 points	2 points
<b>My Information is Accurate</b>	All information in my presentation is accurate. There are no factual errors. *	Most of the information is accurate but there is one piece of information that might be inaccurate.	The information is generally accurate, but one or more pieces of information are clearly flawed or inaccurate.	Information is typically confusing or contains more than one factual error.
<b>My Information is Related to the Essential Question:</b>  <b>How is your animal helpful or harmful to people and or its environment?</b>	The project conveys an understanding of the essential question. There may be additional information that was not required.	The project conveys an understanding of the essential question.	The project conveys an understanding of the essential question but may not be the focus. *	The project does not relate to the essential question.
<b>Cooperation (Teacher Rating)</b>	Frequently listened, asked questions, contributed to discussion, and completed task. *	Often listened, asked questions, contributed to discussion, and completed task.	Sometimes listened, asked questions, contributed to discussion, and completed task.	Seldom listened, asked questions, contributed to discussion, and completed task.
<b>Cooperation (Group Rating)</b>	Frequently listened, asked questions, contributed to discussion, and completed task. *	Often listened, asked questions, contributed to discussion, and completed task.	Sometimes listened, asked questions, contributed to discussion, and completed task.	Seldom listened, asked questions, contributed to discussion, and completed task.
<b>Presentation (Listening and Speaking)</b>	Reports accurate information using appropriate facts, descriptive details while speaking clearly and at an understandable pace. Listens to others with care and attention.	Report accurate information using appropriate facts while speaking clearly and at an understandable pace, but may be lacking details. Listens to others with care and attention.	Reports accurate information using appropriate facts. Presentation may be unclear or at a fast speed. Listens to others with care and attention. * paper up high	Does not make an effort to report to his or her class and/ or does not listen to others with care and attention.

Total Points: 22 / 25

Grade: 88.1  
B



Collaborative Grouping  
Peer Evaluation

Name: Frances

Date: 11-14-12

Group Name: #2

Group Member #1 <u>Josie</u>			
Criteria	Frequently 3 points	Sometimes 2 points	Rarely 1 point
Respectful to other group members and their comments	3		
Stayed on task and did not stray from the assigned problem		2	
Shared ideas with the group and answered questions		2	
Listened to group members' opinions and politely disagreed with reasons	3		
Completed their assigned task and fulfilled their role in the group		2	

Group Member #2 <u>Luis</u>			
Criteria	Frequently 3 points	Sometimes 2 points	Rarely 1 point
Respectful to other group members and their comments	3		
Stayed on task and did not stray from the assigned problem		2	
Shared ideas with the group and answered questions			1
Listened to group members' opinions and politely disagreed with reasons		2	
Completed their assigned task and fulfilled their role in the group	3		

Group Member #3 <u>Jackie</u>			
Criteria	Frequently 3 points	Sometimes 2 points	Rarely 1 point
Respectful to other group members and their comments	3		
Stayed on task and did not stray from the assigned problem	3		
Shared ideas with the group and answered questions	3		
Listened to group members' opinions and politely disagreed with reasons	3		
Completed their assigned task and fulfilled their role in the group	3	2	

**Teacher Reflection:** Your personal assessment. You may add student outcomes in connection to the standards. Use your own essay(s) or the Collegial Critique Form attached.



The students and I both thoroughly enjoyed this PBL unit. My favorite part was the students were excited to work on it and their collaboration and peer learning “Wowed” me! Students who are resistant to do work were excited and motivated. The best thing of all they were having a blast and learning the content they needed to know! When we first started off it made me laugh, because the students’ reaction were “what pages should I look on” or “this does not tell me the answer”. The students quickly learned that the power of learning was in their hands and they took it and ran for the most part! This project pushed me to learn new technology tools and to not be afraid to give the students the reins in the learning experience. In this unit, the students learned all the sciences they needed to touch on, but they took it to a new level. They were able to incorporate Common Core Language and Reading Standards, as well as the Listening and Speaking Standards, and not to mention to Social Emotional Standards. It was rewarding to watch the students take pride in their work when sharing their learning with their peers.

Looking back on the unit, there were some bumps along the way and things I would like to challenge my students and myself in the upcoming PBL units. I want to incorporate more technology in presenting their information. I hope to not only use “go to programs” like PowerPoint but to also have the student use flip cameras, utilize Kidsblogs more, and just get my students more savvy in trying new things. This unit they were more comfortable to reverting back to creating posters, but when I did introduce new technological tools they did get excited. I guess it is my responsibility to in power them with these tools, because they cannot use what they do not know. Another thing to work on is saying focused on the problem based learning model, at times I found myself teaching too much information and not letting go for them to discover on their own! One more thing I would like to improve is to stop to take time to teach the mini-lessons they need. I would like to take more time to model reliable websites and

how to search for quality websites. At times students struggled with researching and got frustrated because the answer was not “black and white” in front of them. I recently observed a school district doing PBL and I picked up on a few things I would love to use in the future. The chart below is similar to the organizer they used to gather information initially. It is so simple yet, it has all they need right there in an organized fashion. Another thing that I picked up on is that even though they have plenty of devices at their hands, they have the students hand write while researching, since they found that kids are more likely to put their findings in their own words. One more thing that I observed was that students had their specific questions to research and then they would come together after they completed their task. Initially, I had my groups researching together, but I see now that the roles are more productive! Lastly the organization of websites provided by the teacher would excellent and organized. The kids just needed one click to get to a list of valid, student-friendly references. I would like to use this idea in the future, especially in the start of the year when students have not been taught “how to” research. When completing the project I was faced with perfect teaching moment to show that when faced with a problem there is not just one way of going about it. I know that each unit I will add to and tweak and I keep reminding myself that PBL is messy! The important thing is that the students are connecting to the standards and stretching themselves!

Guiding Questions	Information Gathered to Answer the Question	Reference(s)