

Spring 4-1-2010

Accelerating the Individual: Mastering the Content with Differentiation and Thinking Skills

Helga J. Purnell

Follow this and additional works at: https://scholar.umw.edu/student_research



Part of the [Education Commons](#)

Recommended Citation

Purnell, Helga J., "Accelerating the Individual: Mastering the Content with Differentiation and Thinking Skills" (2010). *Student Research Submissions*. 200.

https://scholar.umw.edu/student_research/200

**ACCELERATING THE INDIVIDUAL: MASTERING THE CONTENT WITH
DIFFERENTIATION AND THINKING SKILLS**

HELGA J. PURNELL

**EDEL 590 INDIVIDUAL RESEARCH
APRIL, 2010**

Rebecca S. Hayes, Ph.D.

Signature of Project Advisor
Professor of Education

CONTENTS

Abstract	3
Introduction	4
Literature Review	6
What Are Thinking Skills	6
Philosophical Basis of Thinking Skills	11
History of Intellectual Thinking Skills	12
Parallel Curriculum	16
Conclusion	19
Application of Research	20
Initiative Model for Rodney Thompson Middle School	20
References	29
Appendix	31

ABSTRACT

My proposal for EDEL 590 is to investigate the impact of differentiated instruction focusing on teaching thinking skills. My research will include an intense study of literature available on thinking skills, differentiation and the impact of implementing explicit and infused instruction of thinking skills to accelerate the mastering of content. My final product will be a proposed middle school initiative encompassing thinking skills as the core of differentiated instruction to enhance acceleration of learning for mastery of content for all students.

INTRODUCTION

Every student is on a continuum of acceleration to master content. I propose that a student's exposure, as well as, utilization of thinking skills fostered in a differentiated instruction will accelerate a student performance toward mastering of their content.

Teaching thinking skills needs to be implemented with an enculturation approach reflected within a whole school approach. (Tishman, 1995) In essence, the culture of the school embraces the value of thinking skills as the core to differentiated instruction for individual acceleration of content. The thinking skills have different purposes as well as functions, which naturally lead to differentiated instruction. Thinking skills in most educational institutions are a by product of instruction rather than an integral part of the curriculum to be taught directly to students. For example, we teach students the concept of the differences about facts and opinions but do not teach them that the concept is critical for the thinking skill to evaluate evidence.

Differentiated instruction focuses on the needs and interests of the individual student in his or her journey to accelerate mastery of content and beyond. (Tomlinson, 2002) The experience of learning is a critical element for success of an individual. If the experience is focused at the individual student's need or interest level, acceleration can be individually designed. Middle school students are at the stage of conceptualization where upon the transition of concrete to abstract is a necessity for future academic success. In essence, these are the years where thinking skills are critical to teach as well as to master.

To fully understand the effects of the interdependent relationship encompassing thinking skills, differentiated instruction and acceleration, more resources are needed. If this interdependent relationship is successful for students to attain success, not only is there a call to learn about this relationship but also to implement this interdependent relationship in school curriculum. This is the goal of my research. I plan to investigate models practicing the above mentioned interdependent relationship as well as explore the components of the relationship. My research will focus on the following components:

- What are thinking skills?
- How are thinking skills implemented in differentiated instruction?
- Why are thinking skills a necessity for acceleration to attain mastery in content?
- Is there evidence of this triad relationship in middle schools?

With the focus of my research, I will create a model for a middle school which implements the critical interdependent relationship of thinking skills, differentiated instruction and acceleration to attain success in mastery of content.

LITERATURE REVIEW

What are Thinking Skills?

Before one uses thinking skills, one must have an understanding of thinking skills; therefore, definitions are needed to set a foundation of understanding. It isn't quite as simple as one might think, there are a multiple of definitions of "thinking skills." Many in the field of education cite thinking skills as cognitive processes that enable individuals to make meaning from and create with information. (Costa, 2002)

Often included under the definition of thinking skills are habits of mind or thinking behaviors that define attitudes and dispositions of good thinkers. Researchers like Marzano, Perkins, Costa, and Feuerstein believe that students can be taught specific metacognitive strategies for thinking that allow them to more effectively and efficiently process information. They can also learn to demonstrate habits of mind or thinking behaviors in their daily activities.

Many who are interested in the field of thinking skills recognize that it is very difficult to get a universal agreement as to the precise meaning of thinking skills; therefore alternative definitions are generated for other terms used in the thinking skills literature. Alvino stated in his 1990 "Glossary of Thinking Skills Terms", thinking skills is defined as a set of basic and advanced skills and subskills that govern a person's mental processes. These skills consist of knowledge, dispositions, cognitive and metacognitive operations. (Cotton, 1991)

Thinking skills are referred by a variety of terms, such as:

- Bloom's Taxonomy
- Cognition
- Creative and Critical Thinking
- Infusion
- Metacognition
- Transfer
- Five Kinds of Minds
- 21st Century System Thinking Skills
- Patterns of Thinking Method.

Bloom's Taxonomy is a popular instructional model developed by the prominent educator Benjamin Bloom in 1956, which categorizes thinking skills from concrete to the abstract encompassing knowledge, comprehension, application, analysis, synthesis, and evaluation. The last three thinking skills are considered higher-order thinking. In 2000, Anderson and Krathwohl updated the 1956 model with the following thinking skills (concrete to abstract): remember, understand, apply, analyze, create and evaluate. (Cotton, 1991)

Cognition is the mental operations involved in thinking in other words the biological or neurological processes of the brain that facilitate thought. The processes include awareness, perception, judgment, intuition, and reasoning. Thinking is an internal structure that assists in developing cognition. (Cotton, 1991)

Creative thinking is a novel way of seeing or doing things that is characterized by four components: fluency, generating new ideas; flexibility, shifting perspectives easily; originality, conceiving of something new; and elaboration, building on other ideas. On the other hand critical thinking is the process of determining the authenticity, accuracy, or value of something; characterized by the ability to seek reasons and alternatives, perceive the total situation, and change one's view based on evidence. Critical thinking is also referred to as logical or analytical thinking. (Cotton, 1991)

Infusion is integrating thinking skills instruction into the regular curriculum. Infused programs are commonly contrasted to separate programs, which teach thinking skills as a curriculum in it. (Cotton, 1991) Over time, one of the great debates amongst educators is whether to directly teach or infuse thinking skills.

Metacognition is the process of planning, assessing, and monitoring one's own thinking; the pinnacle of mental functioning. (Cotton, 1991) Transfer is the ability to apply thinking skills taught separately to any subject. (Cotton, 1991)

Five Kinds of Minds is a means, according to Dr. Howard Gardner, for individuals to use to think or act. Three are related to intellect: the disciplined, synthesizing and creative minds; two emphasize character: the respectful and ethical minds. Students need to master the content using a disciplined mind; sort out what information is important using a synthesizing mind; and innovate or meaningful change using a creative mind. As well to the intellect, students will move beyond tolerance to acceptance of diversity using the respectful mind and reflective think about his/her actions using the ethical mind. (Howard, 2008)

The 21st Century System Thinking Skills is a framework of learning and thinking skills to assist students to think systematically in a global world. They include:

- System As A Cause (to find a problem, cause, uncover the systems' structure first)
- 10 Miles View (expand your perception)
- Closed-Loop Thinking (search for feedbacks to both policies and mental models; causal relationships)
- Dynamic Thinking (think in continuous terms; try to perceive impacts of small changes)
- Operational Thinking (think in the same way as things are already happening; be consistent in units of measurement)
- Nonlinear Thinking (action and reaction need not to be closely linked)
- Scientific Thinking (quantity and measure; formulate and test hypothesis)
- Creative Thinking (use various supporting tools and methods; overcome obvious solutions with unwanted side effects; surprise others and have fun) (Vojtko, 2009)

Patterns of Thinking Model is a framework with includes four main processes of creating patterns of thinking: Making Distinctions, Recognizing Relationships, Organizing Systems, and Taking Perspectives. This framework reinforces the endless cycle of knowledge and thinking with a feedback loop in which the process of thinking creates the product of knowledge. When we think, we build knowledge; however when we use someone else's hard-won knowledge, we do not receive it as knowledge; it comes to us as information. We then use thinking to process that information into actionable knowledge. In essence, every person does not get knowledge, they build it. (Cabera, 2009)

Philosophical Basis of Thinking Skills

Accompanying the human brain is thinking; therefore everyone thinks. Thinking is part of the brain that figures things out; therefore thinking is seeking connections or patterns to resolve a problem or situation. By thinking, a student is trying to make sense of his/her world by judging, perceiving, analyzing, clarifying, determining, comparing and synthesizing. (Cabrera, 2009) Much of a student's thinking is developed on its own resulting in various degrees of bias, distortion, prejudice or irrationality. Many argue that due to our bias thinking cruelty, injustice and stifling creativity are often infused in our thought production. In essence, feelings or desires can and most likely distort effective and positive thinking. This important relationship of thinking, feeling and wanting determines the behaviors a student will chose to follow; therefore, thinking is the key that strengthens an individual's choice of direction. Due to this important relationship, a system of thinking skills needs to be taught to counter the negative effects of biased thinking.

History of Intellectual Thinking Skills

One could state that mankind has been using thinking skills from the onset of existence; however the depth and magnitude of discussion and documentation of intellectual thinking skills has intensified since 1938 with John Dewey's experiential thinking designs. Montessori followed in 1955 with discover learning using sensory thinking. In 1970 Piaget theorized that the learner's interactions lead to structural changes in how they think about something as they assimilate and accommodate incoming data through constructed learning. (Costa, 2001) In 1972, Mathew Lipman, a university professor was very unhappy at the poor thinking of his students. He felt students were taught in school to learn facts and to accept authoritative opinions, but not to think for themselves. He founded the Institute for the Advancement of Philosophy for Children (I.A.P.C.) at Montclair State College, New Jersey. For the past forty years, he and his colleagues have been developing material for use in schools, aimed at helping young people (from 6 year to late adolescence) to think. (Ginnis, 2009)

Vygotsky in 1978, focused on social interaction thinking skills to develop deep understanding of learning. Reuven Feuerstein in 1990 established that teachers guide students through their learning with questions that deepen pattern thinking as well as metacognitive questioning, which lead to cognitive modifiability. In 2000, Arthur Costa developed a framework of higher-order problem-solving thinking skills called habits of mind. Multiple Intelligence concept was introduced in 1983.

According to Howard Gardner, thinking for understanding for a student is identified in eight realms of intelligence, in various combinations as students interact and connect in the execution of complex tasks. (Costa, 2001)

Joseph Renzulli, from 1977 to 1995, researched gifted education and strategies to teach gifted students. In 1985, with his colleague Reis, he developed a model called School Enrichment Model (SEM) focusing on a magnet theme/enrichment approach for all schools interested in high-end learning and developing the strengths and talents of all students. The major goal of the SEM is the application of gifted education pedagogy to total school improvement. The SEM provides enriched learning experiences and higher learning standards for all children through three goals; developing talents in all children, providing a broad range of advanced-level enrichment experiences for all students, and providing advanced follow-up opportunities for young people based on their strengths and interests. The SEM focuses on enrichment for all students through high levels of engagement and the use of enjoyable and challenging learning experiences that are constructed around students' interests, learning styles, and preferred modes of expression. (Renzulli, 2010)

Edward de Bono in 1986 introduced lateral thinking which evolved into parallel thinking where thinking process is split in specific directions. A student will learn how to think using the Six Hats of Thinking: facts and information; intuition and hunches; judgment and caution; optimism and positivity; creativity and changes; and overview and process management. (Ginnis, 2009)

Sternberg and Grigorenko in 2000 introduced a triarchic theory of intelligence based on 1986 Sternberg's model focusing on analytical, creative and spatial thinking embedded in real life circumstances. (Costa, 2001) David Perkins in 1995 focused on metacognitive thinking through reflection with reference to metacognitive "thinking about thinking." (Costa, 2001) In 1997, Carol McGuiness reinforced the need to develop thinking skills by developing models of infusion through general or specific content context. (Ginnis, 2009) In the 1990's constructivism drove the learning and thinking of students as essentially active. Marian Diamond led the research with her pioneering work as a neurobiologist with the flowering of dendrites in an enriched environment. (Costa, 2001) In 1997, with the rise of school violence, Robert Coles focused student thinking in terms of moral decision making and becoming smarter with their inner character. (Costa, 2001)

Joyce Van Tassel – Baska is a leader in gifted education since the late 1980's to present time and has researched and designed initiatives that encompass deeper thinking opportunities occur when curriculum is designed in a thematic, broad based and integrative. Content, determined by student choice, should be the driving force of the curriculum with the infusion of critical thinking skills. The focus is on six thinking skills: parts-whole analysis, compare-and-contrast, decision making, causal explanation, prediction and generalization introduced at appropriate places in the course of study of the content. Van- Tassel Baska advocates using a set of carefully chosen examples to demonstrate that critical thinking skills can be naturally introduced in the course content.

Her more current analysis reflects that critical and creative thinking skills are in tandem throughout the curriculum. (Van-Tassel Baska, 2005) She also advocates that the explicit teachings of thinking skills, determine by the content mastery and student needs, stimulate students thinking and accelerate their learning ability to master content.

From 1995 to present time, Sharon Tishman and the Harvard Graduate School of Education have been researching thinking skills, especially in the context of creating a school culture of thinking. A culture of thinking broadly stated is the notion of culture using integrated patterns of thought and behavior that binds together members of a group where the spirit of good thinking is everywhere. (Tishman, 1995) Tishman introduces the six dimensions of thinking as the following:

- a language of thinking (terms and concepts used in a classroom)
- thinking dispositions (student attitudes, values and habits of mind)
- mental management (Metacognition)
- the strategic spirit (attitude that encourages a culture of thinking)
- higher order knowledge (beyond factual information)
- transfer (applying knowledge and strategies beyond one context to another).

Carol Tomlinson in 2002, an expert in differentiation, illuminates through Parallel Curriculum to utilize thinking skills as analytical, critical, and synthetic which require students to perceive, process, rehearse, store, and transfer new knowledge and skills that have been introduced in the teaching activities based on student need or interest.

(Tomlinson, 2002) In the Curriculum of Identity component of parallel curriculum, processing and creative thinking are critical elements to strengthen students' ability to self assess their progress in gaining the knowledge needed to proceed with future learning endeavors.

Parallel Curriculum Model

The Parallel Curriculum Model is a plan for moving every child toward expertise incorporating a set of four interrelated designs that can be used singly, or in combination, to create or revise existing curriculum units, lessons, or task. Each of the four parallels offers a unique approach for organizing content, teaching, and learning that is closely aligned to the special purpose of each parallel. (Tomlinson, 2002) The reasons for four parallels are the following:

- Qualitative differentiated curriculum is not achieved by doing only one thing or one kind of thing.
- Students are different encompassing styles, interests, environments, and opportunities.
- Students have different needs at different times in their lives.
- Students have different levels of expertise.

Within the model are four facets of qualitatively differentiated instruction, which are the Core (essential nature of a discipline); Connections (relationships among knowledge); Practice (plan of application of the knowledge); and Identity (developing students' interests and expertise, etc.) These facets of qualitatively differentiated instruction are the parallels. Each of the parallels have components that align with each other; can be used singly or in combination; is of equal value and use with a variety of students or with an individual student at a variety of times; and the choice to use a particular parallel is strongly associated to learner's profiles, the subject area, content goals, related units, lesson and tasks. (Tomlinson, 2002)

The Parallel Curriculum Model provides a design of curriculum to meet the needs of a diverse population enriched with authentic instruction. Differences amongst learners have been studied for decades. Vygotsky and Bloom have established that students have different levels of prior knowledge and cognitive abilities. Bruner, Taba and Tyler research findings support that some students need, prefer, or learn best with a logical, sequence of main ideas that explain the structure of a topic or discipline, Sternberg established that other students prefer to think in analogies and to see relationships among and across ideas. John Dewey states that many students prefer to see how ideas are used in the world. Wigginton and Summerhill established that others need to see the personal relevance of ideas and topics to become motivated to learn. (Tomlinson, 2002)

James Lee, in the October 2005 Phi Delta Kappan magazine stated, “When students engage in challenging and authentic learning activities in which purposeful intellectual work is connected to real world of problem solving and creative projects and in which a critically supportive audience responds to work in progress, students’ motivation and commitment to meet high expectations increase dramatically.”

CONCLUSION

Research documents decades of study on how thinking skills are critical for academic as well as life long learning success. There has been a prolonged debate on how to teach thinking skills, infused or explicitly. Multiple educational researchers state that mastering the content is the goal of our schools also giving consideration to the reality that our student populations are diverse in needs and interests. With these documented findings, reality dictates that a school-wide framework for acceleration for all students to master their content in parallels, singularly or combined with explicitly taught thinking skills to foster motivation and academic success. Our students are no longer competing in a domestic market; they are in a global competition where international students are explicitly taught to think. With this reality our students are at a disadvantage before they begin. We can no longer assume that they know how to apply thinking skills; we must guarantee that they know what thinking skills are and how to use them in daily scenarios. The acceleration to think to master content is crucial for our students to engage in the arena of global competition. Our educational institutions need to develop curriculum that is designed with the expectation that all students will master their content using thinking skills.

APPLICATION OF RESEARCH

Differentiation for Excellence Middle School Initiative is an all inclusive initiative embedded with strong , differentiated instruction fostered with intellectual thinking skills to actively engage each student to achieve excellence in his/her education, enabling success in a global society as well as sustainable growth for life - long learning. All members of the *Differentiation for Excellence Middle School Initiative* will collaborate to support, provide and celebrate relevant, rigorous instruction in a safe, responsible, and respectful learning community while challenging all to reach their fullest potential. The *Differentiation for Excellence Middle School Initiative* affirms that all individuals can become competent thinkers. The *Differentiation for Excellence Middle School Initiative* exemplifies a cognitive methodology where learners must develop an awareness of themselves as thinkers and learners, as well as, practitioners of the approaches and strategies for effective thinking.

The goals of the *Differentiation for Excellence Middle School Initiative* are:

- Create and provide a core of intellectual thinking skills taught independently as well as interpedently throughout the year
- Professionally Learning Communities are the engines of implementation of Differentiation for Excellence program
- Create and provide vertical support for high school extended instruction
- Challenge students to perform their best and reach their fullest potential

- Provide technology based learning opportunities
- Provide a school environment that is responsive to the strengths and weaknesses of each student
- Employ a broad range of differentiated learning experiences that are relevant, challenging, integrative, independent and exploratory
- Employ authentic and traditional evaluation techniques are employed that provide evidence of student's learning progress and determine future needs
- Create positive learning environment through intercultural awareness, understanding, and respect
- Develop learning experiences to enhance understanding of global interactions.

At RTMS, we have gained annual yearly progress with meeting the standards mandated by state; however, our data reflects the need to differentiate the learning opportunities to increase advance performance in middle school state assessments. Our data reflects that only 30% of our students are attaining advanced proficient scores on their state assessments.

At the nucleus of the *Differentiation for Excellence Middle School Initiative* are thinking skills focusing on self-thinking, organizational thinking, creative thinking and altruistic thinking. Self-thinking skills reinforce the essence of being an intellectual by teaching meta-cognitive thinking, career awareness, health-oriented choices and Habits of Mind. Organizational thinking focuses on using critical thinking skills based on evidence and tools to apply logic. One example of organizational thinking is a systematic use of categorizing concepts for all disciplines so students witness interdisciplinary connections in their studies. Altruistic thinking will be channeled through community service and global awareness activities. Creative thinking will be taught in concert with imagination, innovation and solution - based learning activities. Students with a repertoire of thinking skills will have transferable skills that allow them to address different problems in different contexts at different times throughout their lives.

The nucleus of the program is strengthened by an inquiry - based curriculum design that is rich in differentiation opportunity for all, yet flexible to address individual differentiation. Academic classes will be designed with acceleration as the main driving force of instruction infused with standards mandated by the state. Foreign language will be taught in grades 6th through 8th. The *Differentiation of Excellence Middle School Initiative* at RTMS will also include independent study throughout content as well as electives and exploratories. Independent studies projects and thesis will be displayed at an end of year culminating event where upon the community will celebrate the acceleration of all TMS students.

Differentiation for Excellence Middle School Initiative curriculum will:

- Guide students in mastering key information, ideas, and the fundamental skills of the disciplines
- Help students grapple with complex and ambiguous issues and problems
- Move students from novice toward expert levels of performance in their disciplines
- Provide students with opportunities for original work in the disciplines
- Help students encounter, accept, and ultimately embrace challenge in learning
- Prepare students for a world in which knowledge expands and changes at a quantum pace
- Help students determine constants in the past and in themselves while helping them prepare for a changing world
- Help students develop a sense of themselves as well as of their possibilities and responsibilities in the world in which they live
- Be compelling and satisfying enough to encourage students to persist in developing their capacities. (Tomlinson, 2002)

Members of the school site of the *Differentiation for Excellence Middle School Initiative* are the creators and deliverers of a differentiating curriculum where upon every student accelerate her/his learning.

The proposed timeline for initiative entails the following:

September 2009 – July 2010: Exploration and development year:

- search for international or national awards; models of differentiation and thinking skill based programs; models of independent studies; schedule creation encompassing independent studies; and training of staff

August 2010 – July 2011: Implement school wide *Differentiation for Excellence* initiative and evaluate with feedback

August 2011 – July 2012: Continue *Differentiation for Excellence* initiative with adjustments (if needed) from feedback

August 2012 – July 2013: Decision year with academic and performance scores as indicators of success

Human and capital resources are needed in the following domains:

1. Training for all staff in Thinking Skills Nucleus and program initiatives
2. Training in Virtual Virginia for Foreign Language Instruction
3. Training for Differentiation Instruction
4. Training for independent study, and thesis/research paper presentation
5. Posters, lessons, and visuals of thinking skill curriculum
6. Membership to Virtual Virginia
7. Updated computers : mini-computers

8. One Additional assistant principal to coordinate and provide professional growth development for program
9. New instructional resources for students
10. Substitutes teachers for teachers meeting to plan vertical instruction/curriculum

Distributed leadership is needed to promote and facilitate the implementation of the initiative to foster school-wide commitment and empowerment. The School Improvement Committee and principal will educate school board and county administrators through Focus Groups. The School Improvement Committee and principal will gain insight and buy in from staff with presentation and focus groups. The School Improvement Committee and principal will meet with parents and community members to educate and gain their perspectives.

To enhance the transparency and effectiveness of the initiative, an evaluation process needs to be implemented. The proposed evaluation process includes the following steps:

1. Evaluation will be twice a year with a midyear review and end of year.
2. Data from school performances: quarterly assessments, annual assessments, 8th grade thesis/research paper presentation and honors class grades and AP test scores

3. SIP team with principal will review data and input from staff before making decisions on how program will continue.
4. Principal will share results with his/her supervising superintendent.
5. Use of external created higher level assessments
6. Portfolio assessments

With any initiative, potential risks need to be identified and addressed with critically and creatively thinking skills. The major potential risks on the onset of the initiative are:

1. Change anxiety amongst staff
2. Funding for resources and additional staff
3. Scheduling.

The proposed essential elements of the curriculum are the following:

6th Grade:

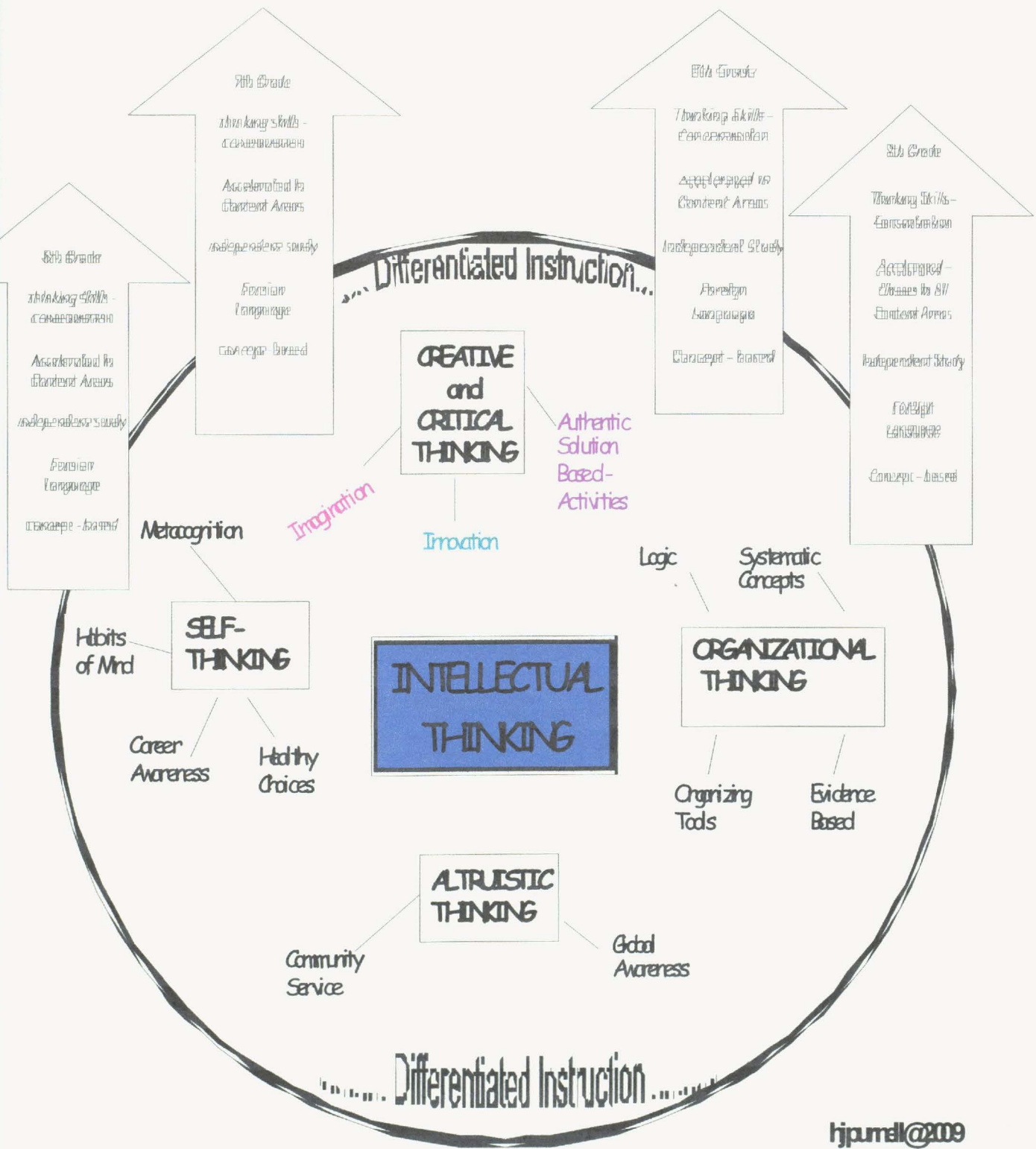
1. Non SOL testing content area and exploratory/elective classes will teach the nucleus thinking skills to students.
2. All content teachers infuse nucleus thinking skills into their curriculum.
3. Differentiation is applied throughout the 6th grade curriculum.
4. Acceleration will be practiced in all classes.

7th Grade:

1. Nucleus thinking skills are fine-tuned through research activities in non SOL testing content area and exploratory/elective classes.
2. All teachers infuse nucleus thinking skills in their curriculum.
3. Seventh grade will provide extension classes for all content areas.
4. Differentiation is applied throughout the 7th grade curriculum.
5. Acceleration will be practiced in all classes.

8th Grade:

1. Nucleus thinking skills are fine-tuned through researched – based process paper presentation activities in non SOL testing content area and exploratory/elective classes.
2. All teachers infuse nucleus thinking skills in their curriculum.
3. Eighth grade will provide advanced classes for all content areas.
4. Differentiation is applied throughout the 8th grade curriculum.
5. Acceleration will be practiced in all classes.



REFERENCES

- Cabrera, Derek., Colosi, Laura. (2009). Thinking at Every Desk. Ithaca, New York: Research Institute for Thinking in Education.
- Costa, Arthur. (2001). Developing Minds, 3rd Edition. Alexandria, Virginia: ASCD.
- Cotton, Kathleen. (1991). Teaching Thinking Skills. Portland, Oregon: Northwest Regional Educational Laboratory.
- Garner, Howard. (2008). Five Minds for the Future. Boston, Massachusetts: Harvard Press.
- Ginnis, Paul and Sharon. (2009). Thoughts about Thinking. Derby City, United Kingdom: Derby College Press.
- Renzulli, Joseph. (2009). School- wide Enrichment Model. Storrs, Connecticut: NEAG Center of the University of Connecticut.

Tishman, Shari., Perkins, David., Jay, Eileen. (1995). *The Thinking Classroom – Learning and Teaching in a Culture of Thinking*. Boston, Massachusetts: Allyn and Bacon.

Tomlinson, C., et al. (2002). *The Parallel Curriculum: A design to develop learner potential and challenge advanced learners*. Thousand Oaks, California: Corwin.

Van-Tassel Baska, Joyce. (2005). *Differentiated Instruction: Challenging High-End Learners*. Portland, Oregon: Office of Special Education, Talented and Gifted.

Vojtko, Joe. (2009). *21st Century System Thinking Skills*. (PowerPoint Slides).

Retrieved from Nova Mind website on March 19, 2010:

http://www.novamind.com/connect/nm_documents/show_branch/vvojtko/b

815c5a6-0097-4791-aafc-803179a008f3/333942546

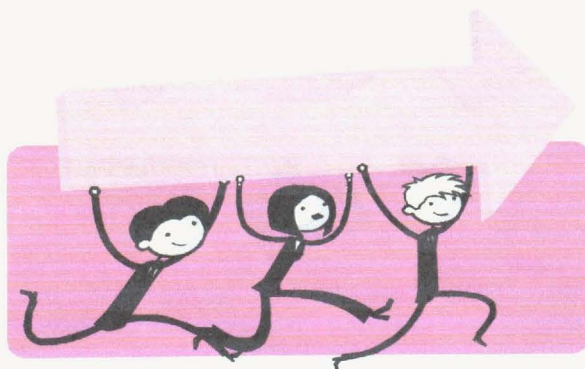
APPENDIX

Accelerating The Individual

Mastering The Content
Using Differentiation and Thinking
Skills



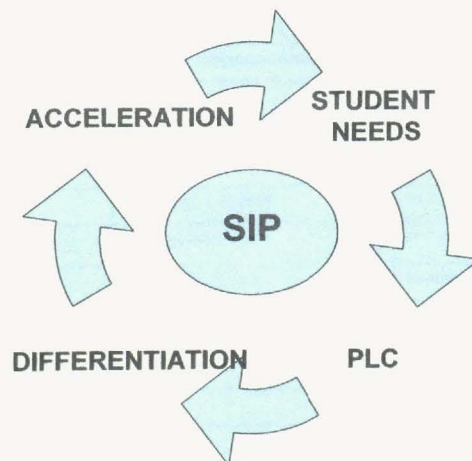
PURPOSE



GOALS of Acceleration at RTMS

- A school-wide focus on differentiation to meet the student's individual needs
- Each student leaves TMS with a set of critical, creative and intrinsic thinking skills
- Each student will experience an opportunity for independent study
- All content area SOLs Advanced Test scores increase by 10% annually
- Shift from traditional summer school to enrichment opportunities (Super Summer Sensational Experience)

Bridging With SIP In A Systematic Approach



Essential Components of Initiative for Students

- Growth and application of intellectual thinking skills
- Differentiation of instruction in content, process and products
- Independent study opportunities
- Research – based process papers
- Acceleration
- Blended Instruction opportunities, including Virtual Virginia to strengthen technology based instruction

VIRTUAL VIRGINIA RTMS Implementation Schedule

PILOT YEAR	1ST YEAR (Partial)	2ND YEAR (Full)
15-World Language/Cultures (7)	15-World Language/Cultures (6)	15-World Language/Cultures (6)
	15 – Chinese I (7)	15- Chinese I (7)
	15 - Latin I (7)	15 - Latin I (7)
	15 - French I (7 or 8)	15 - French I (7 or 8)
	15 - Spanish I (7 or 8)	15 – Spanish I (7 or 8)
	15 – Arabic I (7 or 8)	15 Arabic I (7 or 8)
	15 – World History/Geography (8)	15 – World History/Geography (8)
	15 – Earth Science (7)	15 – Earth Science (7)
		15 – Chinese II (8)
		15 – Latin II (8)
	4 periods	5 periods

Essential Components of Initiative for Staff

- Professional Learning Communities as professional development engines
- Intellectual thinking skills to enhance higher-order thinking
- Differentiation of instruction in content, process and products
- Portfolio of student performance



Basic Characteristics of Each Zone

- Criteria to determine student placement
- Bloom's Taxonomy applied differentially in class sessions
- Goal is acceleration of content
- Nine weeks rotation
- Ultimately all students will experience one of the independent learning zones
- Teachers will have choice throughout the year teaching the zones

EMERGING ZONE

WHO: Students who failed SOLs or are more than two years behind in grade level

WHAT: Math, Reading and Writing Acceleration Sessions using a blend of direct instruction and cooperative learning

THINKING Cooperative learning norms

SKILLS: Bloom's Higher – Order Thinking

Group Size: Smallest, no more than 4 to 5

STRENGTHENING ZONE

- Who: Students who barely passed or failed SOLs (360 – 430)
- What: Math, Reading or Writing Acceleration Session using a blend of direct instruction and cooperative learning
- Thinking Skills: Cooperative learning norms
Bloom's Higher – order thinking
- Group Size: Small, no more than 12 students

Supportive Independent Study Zone

- WHO: Students passed SOLs with scores in the 430 – 500 range
- WHAT: Student choice of study of a content area topic in cooperative learning groups using problem-based projects (NHD, Science Fair, Virtual Virginia, Robotics, Model UN, We the People, Eco-Delaware, etc.)
- Thinking Skills:
 - * Basics of Cooperative Learning
 - * Bloom's Higher Order Thinking Skills
 - * Research Skills
- Group Size: At least 30

Self- Directed Learning Zone

WHO: Students who passed SOLs with scores above 500

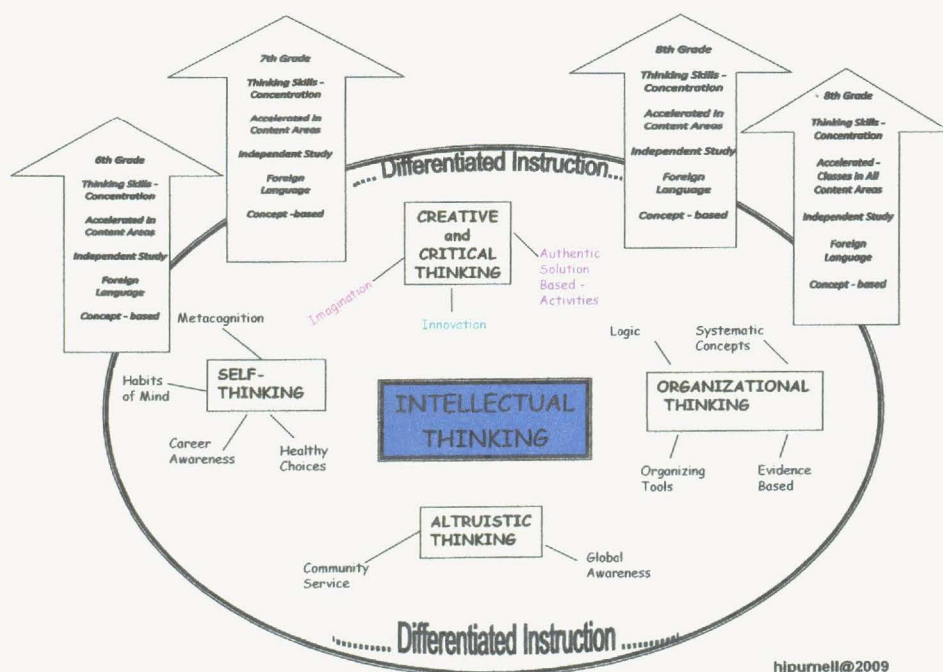
WHAT: Student Choice of any problem – based project

Thinking

Skills: Review of Bloom's Higher Order Thinking Skills and Research Skills

Group

Size: Over 30



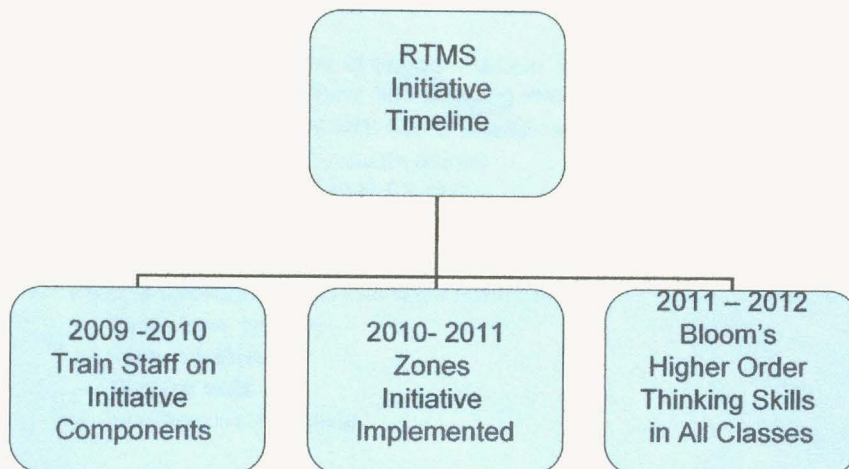
SCHEDULING

- Staff Surveys
- Results of District Models
- Staff Research

Discussion Points for Managing The Initiative

- Placement of students
- Monitoring student achievement
- Facilitation of independent work
- Placement of teachers
- Assessments
- Rubrics
- Student Tasks
- Scheduling

RTMS Initiative Short Term to Long Term Goals



Resources Required

<i>Resource Needed/ Time</i>	<i>COST</i>
* Training of Staff 1. Project Zero conference in February 2. Train staff by June 2010 3. Summer Training of Staff * Coordinator for Initiative * Additional Staff to support Virginia Virtual Lab * Super Summer Sensational Experience	\$700.00 per person (up to seven people) Sub money Initiatives for staff to come in during summer month (PDS or staff development perineum) Negotiable Teacher or Para-educator (\$34,000 - 14,000) Summer School salary for teachers
* Materials 1. Published information @ training 2. Classroom materials (posters and student resources: mobile labs with mini- computers) 3. EXPO Celebration event	\$2500.00 \$40,000 \$1000.00

BENEFITS

- Vertical approach to accelerate ALL students embedded in the school day
- Providing opportunities of engagement in skills necessary to transition into high-school and life-long learning
- Collaboration partners with two universities:
 - Harvard University Graduate School
 - UMW Graduate School of Education
- Professional opportunities for teacher leadership
- Collaboration amongst SCPS middle schools
- Vertical approach of school-wide norms for :
 - Cooperative learning
 - Research skills
 - Thinking skills
 - Interdependent learning