

Knowledge Area Module 5

Theories of Intelligence,
Learning, and Motivation for Persons with Special Needs

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Knowledge Area Module 5

Theories of Intelligence, Learning, and Motivation for Persons with Special Needs

Breadth Component

EDUC 8511: Theories and Principles of Human Learning and the Human Side of Exceptionalities

Abstract

The theme for the Breadth of KAM 5, Theories of Intelligence, Learning, and Motivation for Persons with Special Needs, centers on the ideas of theorist Howard Gardner in the areas of placement, assimilation, and assessment. The foundation of the Breadth section identifies, defines, and critically discusses traditional and contemporary theories of learning focusing on the broad perspective of students with diverse needs in learning. The writing will follow a sequence organized by the theories and how the theory affects the placement, assimilation, and assessment of students with special needs.

Knowledge Area Module 5

Theories of Intelligence, Learning, and Motivation for Persons with Special Needs

Depth Component

EDUC 8521: Educators as Facilitators of Inclusive Learning in Varied Educational Environments

Abstract

How learning transpires with students with special needs in the inclusive environment will be the focus of the Depth section of KAM 5. Theoretically, didactical methods used in inclusive classes do not foster success for students with alternate styles of learning. Innovative methods of teaching based on brain research, learning styles, and nontraditional assessment, introduced into inclusive classrooms benefit not only special education students, but the regular education student, as well.

Knowledge Area Module 5

Theories of Intelligence, Learning, and Motivation for Persons with Special Needs

Application Component

EDUC 8531: Educational Practices Grounded in Principles/Theories of

Learning, Diversity, and Inclusion

Abstract

The Application of KAM 5 demonstrates the combination of the Breadth analysis of the broad theoretical description of an understanding for the learning capabilities of all students, combined with the narrower focus in the Depth theme of the need for alternate teaching and assessment for students with identified learning disabilities. The results produce a summary of a teaching and learning demonstration that incorporates multiple learning styles focusing on student strengths. The summary is based on a teaching and learning demonstration completed in 2001, involving a group of high school resource science students with diverse needs. Examples of lesson plans, teaching strategies, and interventions are included to assist educators in altering curriculum for all levels of learners in the mainstream environment.

From: Renee Rau [rrau@waldenu.edu] on behalf of LA Registrar [la@waldenu.edu]
Sent: Friday, June 16, 2006 12:02 PM
To: mswin001@waldenu.edu
Cc: bfolz@win.waldenu.edu
Subject: LA Approval - 5

Marsha Swindler,

I am pleased to inform you that the learning agreement for KAM 5 has been received and approved by the Office of the Registrar. **Please save this email for your records.**

Regards,

Renee

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Student Self-Evaluation: Knowledge Area Modules (KAMs)

This area is intended for submitting the final version of your KAM Self-Evaluation form to your assessor(s), faculty mentor, and the Office of Student Records.

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KAM Number	5
KAM Title	Theories of Intelligence, Learning, and Motivation for Persons with Special Needs

1. What knowledge/experience did you bring to this KAM? How did you capitalize/expand on this base?

Life experiences in multiple arenas provided a base of knowledge for KAM 5: Theories of Intelligence, Learning, and Motivation for Persons with Special Needs.

- classroom experience of 21 years: middle and secondary students and educators
- Instructional Assistant with special needs high school students
- High school teacher of regular education and special needs students
- 5th grade teacher of inclusion and English as a second language students (ESL)
- Teacher of Confirmation classes for at risk students
- Mentor for two of my four brothers with special needs: inability to learn to read
- Counselor/instructor for religious medals for Boy Scouts of America
- Mother of two sons and a daughter (one diagnosed with ADD; one with ADHD)

- BA in Human Development
- MA in Education
- 38 years of marriage
- raised in a family with four brothers and two sisters

The wealth of knowledge from many years of life experiences coupled with formal education provided ample insight to ask the questions in areas of intelligence, learning, and motivation for students with special needs required for the research.

2. Describe the quality of the **Breadth** section in the light of the intellectual and communication skills demonstrated in this KAM.

Based on the characteristics of classical and contemporary theorists in the areas of intellectual development, knowledge is powerful as described in the Breadth section. The quality of the synthesized and integrated information provided in the well documented narrative reflects the normal intellectual development of human beings. Human intellectual growth and potential for learning and motivation are captured in the summary, easy for the reader to understand and interpret from the comprehensive quality of the report.

3. In the **Depth** section, what key ideas/concepts most engaged your thinking and imagination relative to your area of study?

All students can learn, provided that all educators are aware of the potential to learn that exists within every individual regardless of learning styles that may differ from the norm. Breaking tradition, especially within school organizations with ancient traditions of teaching and learning takes courage. Social scientific research indicates that a paradigm shift is on the brink in the education community in the way students with learning styles outside the normal logical and linguistic methodology are accepted into the mainstream environment.

4. Expound on the most meaningful theoretical construct studied and applied to your professional setting in the **Application** section. What can you do differently/better as a result of this KAM?

Individual potential for learning is not currently recognized outside two areas of intelligence commonly used in educational settings, that of linguistic and logical intelligence. Howard Gardener's (1983, 1993) theory of Multiple Intelligences recognizes seven areas of intelligences to consider in developing curriculum for all levels of learners. As a result of the information gathered for KAM 5 Application, the realization that classroom curriculum can be adapted to reach all learners developed. Using the Multiple Intelligences theory guidelines offers more opportunity for students to reach full learning potential, easily adaptable to current curricular practices. I can now better adapt curriculum to all levels of learners as a result of KAM 5 research. I now better understand that multiple levels of learning and motivation exist, and that awareness must be elevated to reach all educators in service of multiple levels of student learners by offering suggestions for alternatives to teaching and learning outside of what may seem to be normal.

5. Briefly describe the most important **Social Issue** covered in this KAM.

The Individuals with Disabilities Education Act (IDEA) (1965/2004) mandates the placement of special education students in the least restrictive environment creating a paradigm shift in special education student rights to a free and appropriate education. All students deserve the right to the best education opportunities, despite learning disabilities. A learning disability does not diminish the individuality of a human being capable of growth and potential development for learning and motivation, albeit from an alternate style of learning. The enormous social issue facing educators is adapting curriculum to all students within the mainstream classroom environment. Flexibility in the classrooms to accommodate all levels of learners is no longer an option, so the need to understand why adolescents do what they do leads to more successful teaching and learning environments. The intelligence, learning, and motivation of all levels of learners break tradition, recognizing an urgent social issue in need of social change.

Contents

Introduction

Breadth Component

EDUC 8511: Theories and Principles of Human Learning and the Human Side of Exceptionalities

Perspectives on Human Learning and the Human Side of Exceptionalities

References

Depth Component

EDUC 8521: Educators as Facilitators of Inclusive Learning in Varied Educational Environments

Annotated References

Analysis of Facilitators of Inclusive Learning in Varied Educational Environments

References

Application Component

EDUC 8531: Educational Practices Grounded in Principles/Theories of Learning, Diversity, and Inclusion

Summary of Multiple Learning Styles

Intervention and Strategy List

References

Appendix A-H: Lesson Plans and Adapted Curriculum

Introduction

Recognizing the uniqueness, individuality, and capabilities of special needs students challenges anyone who does not understand learning disabilities. The Breadth section of KAM 5 is a broad description that provides an understanding of the learning capabilities of all students with and without learning disabilities some of which is foreign to the majority of the faculty and staff of any educational institution. The obviousness of a wheel chair bound individual in need of special services requires no further explanation. The difficulty arises when the unobservable learning disabilities are often not recognized within traditional didactical methods of teaching and learning in inclusive environments.

Considering the broad scope of Breadth section, the narrower focus of the Depth section will provide insight into learning styles describing, for example, how the musically gifted student struggles when the lecture/take notes format of teaching does not incorporate alternate learning styles. Research in the Depth section sheds light to answer the question of why a student with a writing disability may fail if the only method of assessment is an essay based test. Given alternate methods of assessment, the musically adept student or the writing challenged student proves mastery of theme and character by developing an oral presentation or incorporating singing and guitar playing. Focusing on strengths and not weaknesses supports the theory that all students can learn.

The Application of KAM 5 is a summary of a video presentation of teaching and learning demonstrating how students with learning difficulties succeed, supporting the need for alternate teaching and assessment. A report on the development of the 2001 teaching and learning demonstration incorporating multiple learning styles that focus on student strengths ensues.

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Contents

List of Figures	iii
Introduction01
Implications for Social Change01
Overview of Theoretical Perspectives04
Social Cognitive Theory: Bandura05
Environment and Cognition: Piaget07
Multiple Intelligences: Gardner12
Conclusion18
References21

Figures

<i>Figure 1. Social Cognitive Theory: Bandura</i>	06
<i>Figure 2. Cognitive Development Theory: Piaget</i>	10
<i>Figure 3. Multiple Intelligences Theory: Gardner</i>	13

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Breadth Component

Introduction

The relationship between intelligence, learning, and motivation are but a few of the influential factors imposed as learning institutions attempt to balance teaching styles and the learning capabilities of all students. How human beings understand and process information comes into question and will be explained in the Breadth section of KAM 5. The term cognitive, defined in the Merriam-Webster's dictionary (2003) as "the conscious intellectual activity of thinking, reasoning, or remembering" (p. 240), aids in the ability to understand the development of information processing in human beings. If cognitive functions are misunderstood or misinterpreted, management and balance related to human intelligence, learning, and motivation may result in negative outcomes. Reasonable explanations require background information developed by theorists concerning cognitive development affecting the relationship between intelligence, learning, and motivation. Albert Bandura (1977), Howard Gardner (1983, 1993), and Jean Piaget (1965) studied cognitive development by considering the theories of Erikson (1950), Freud (1933), and Maslow (1968), among others, and then devised new theories to support a better understanding of cognitive human development.

Implications for Social Change

Mainstreaming special education students into regular education classrooms is an urgent social issue in education. A deeper understanding of intelligence, learning, and motivation provides answers for better possibilities to adapt regular education classrooms. Flexibility in the classrooms to accommodate all levels of learners is no longer an option, so the need to understand why students do what they do leads to more successful teaching and learning

environments. If educators are better prepared for how students attempt to understand, process, and learn new information, then misconceptions may not impede the placement, assimilation, and assessment of students identified with learning disabilities in teaching and learning.

All students deserve the right to the best educational opportunities, despite learning disabilities. A learning disability does not diminish the individuality of a human being capable of intellectual growth and the potential for learning and motivational development. All students can learn, albeit from an alternate style of learning. Individual potential for learning is not currently recognized outside two areas of intelligence commonly used in educational settings, that of linguistic and logical intelligence. Howard Gardener's theory (1983) recognizes seven areas of intelligences to consider in developing curriculum for all levels of learners. The enormous social issue facing educators is an understanding for the need to adapt curriculum to all students' abilities within the mainstream classroom environment.

If society is to progress positively into the 21st century for the betterment of humankind, then support systems, specifically the school system, must meet the challenges through research and social change. Social change demands that challenge, and support systems, question past trends. The relationship between intelligence, learning, and motivation are but a few of the influential factors imposed as learning institutions attempt to balance teaching styles and the learning capabilities of all students. Human conditions continue to improve with the education, research, and understanding of new theories as they appear. The classical theories of human intelligence, learning, and motivation combined with the contemporary theories provide what is needed to meet the demands faced by the next generation, as social change dictates. Every person is created as a unique being with a potential in need of actualization (Maslow, 1968).

Although there are common patterns in human learning, each human being develops in a unique way at an individual rate. It is up to caretakers, educators, and parents to discover and explore the uniqueness of each individual.

The process of human learning is lifelong, and as physical and cognitive questions and answers are explored along the way, an integrated holistic human being with influences from heredity and environment emerges. Intelligence, learning, and motivational development takes place despite environment and heredity, positive or negative, factoring into the understanding of how and why mankind thinks and reacts in ways not always easy to decipher. There may be pain, struggles, frustration, and conflict along the path of development dependent upon the reluctance or adaptation to change. The environmental balance of challenge and support significantly influences the degree of learning, easing the process of change between the stages in human learning. As the development of intelligence, learning, and motivation advances through the stages of life, numerous endings and beginnings take place, enhancing the quality of human life along the way. The end result: a human being determines who they are and decides what to do with who they are, creating the ultimate goal for each individual seeking identity in the world as a member of society.

As individuals, it is necessary to choose a path for the future using the tools given by parents, teachers, and guardians. The *psychological moratorium* that Santrock (1999) and Dembo (1994) write about concerning intellectual development is the gap between the security of childhood and the autonomy of adulthood. Individuals must close that gap for themselves, which is not always an easy process. Intelligence, learning, and motivation are but a few of the influential factors imposed as humanity muddles through the obstacles in life in search of an

identity. Learning comes from mistakes, so constant protection from mistakes may stifle the future development of an individual. Finding balance between the stages will develop individual understanding so that the knowledge of when to allow or delay impulses is learned and developed as a skill. More detail will be provided in the Depth section regarding special education students ability to learn and the need for teaching understanding, management, and balance without the fear or need for parental protection and intervention.

As theories develop and evolve in the cycle of learning, only to be tested, challenged, and redeveloped by social scientists seeking improvement, the process of teaching and learning continues to evolve and improve. Social scientists take risks with acquired learning through the generating of social change, as Kegan (1983) appropriately states, “at helping us to see better what it is that people are doing, what the eye sees better the heart feels more deeply” (p. 16).

Overview of Theoretical Perspectives

Intelligence had been studied and measured by experts who point in several directions, recommending varied ways to view it. Recognizing individuality before using standardized tests results in measuring human competence should become a priority. “An intelligence test should not be used as a sole indicator of mental retardation or giftedness” (Santrock, 1999, p. 286).

Compassion cannot be scored on a test, yet we need to use compassion in our dealings with others, as the treatment of all human beings demands justice and fairness (Masters & McGuire, 1994).

The placement, assimilation, and assessment of students identified with learning disabilities in academia teeter on how fair the interpretations are enacted by legislators, and if justice is served to all levels of learners with the mandated policies. Guidelines provided by

theorists are needed to aid in the understanding of the learning process. The realization that current classroom curricular practices can be easily adapted to reach all learners by using classical and contemporary theory guidelines offers more opportunity for all learners to reach full learning potential.

Learning, a human process for storing information, was the apex of life according to the early Greeks, Plato, and Aristotle. Thomas Aquinas, a great thinker and philosopher of his time who blended the teachings of Plato and Aristotle, “acquired a reputation as an influential intellectual” (O’Donnell, 1995, p. 88), and chose learning over family fortune and fame, so that truths could be revealed through his learning. He overcame his shyness and reluctance to public speaking as his love for the truth prevailed. As theories develop and evolve in the cycle of learning seeking truths, only to be tested, challenged, and redeveloped by social scientists seeking improvement, the process of human learning continues to evolve and improve. Social scientists take a risk with acquired learning through the generating of social change, thus reliance on classical and contemporary theories on which to base suggested change is crucial.

Social Cognitive Theory: Bandura

Armed with the vicarious experiences of his youth, a young Albert Bandura disagreed with the focus of a study that followed the Freudian learning theory (1933) promoting the trial and error process of performing tasks and suffering the consequences (as cited in Pajares, 2004). According to his predecessors Erikson (1950) and Freud (1933), the classical learning theory required overt action completed in step by step stages of development. Bandura (1977) believed that through observation of others, modeling can have as much of an impact on learning as direct experience and is unrelated to the stage development process. Using the cognitive function of

memory coupled with vicarious experiences, Bandura states, “The highest level of observational learning is achieved by first organizing and rehearsing the modeled behavior symbolically, and then enacting it overtly” (p. 27).

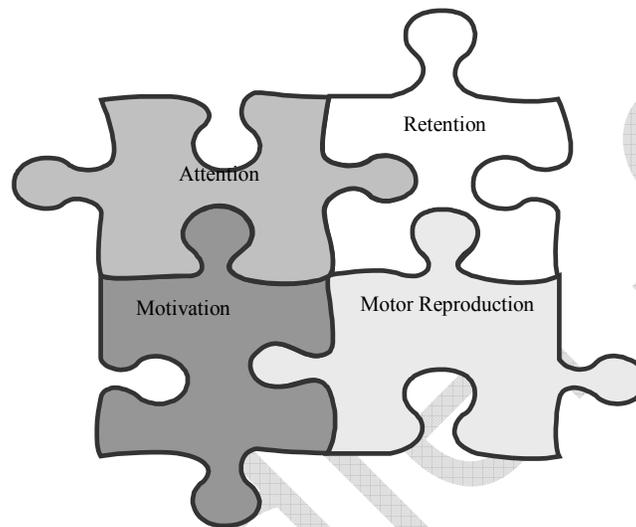


Figure 1: The processes of attention, retention, motor reproduction, and motivation work together in the environment enabling learning to take place (Bandura, 1977).

Social Learning Theory, as it was first named (Bandura, 1977, p. 24) was later renamed Social Cognitive Theory in 1986 as the original label “had become increasingly misleading because it applied to several theories founded on dissimilar tenets” (as cited in Pajares, 2004). Bandura began his studies of human socialization at Stanford University in 1953 where he continues to study the interaction of environment in regards to human development, also studied by Erikson (1950) and Piaget (1965).

Using the power of example as a premise, Bandura’s (1977) theory discusses the use of symbols as tools for communication, as “humans don’t just respond to stimuli, they interpret

them” (p. 59). By storing events in visual images and verbal codes, the learner often acts out a fantasy in the mind to reinforce the observation, remembering the event for future use. By symbolizing experiences and observations, human beings give meaning and structure to their lives, using the learned experiences to balance challenge and support for further growth in the development process (Bandura, 1977; Sanford, 1970). Whether the modeled event is interpreted as a positive or negative is unbeknownst, leaving the Social Cognitive Theory vulnerable to criticism.

Despite the criticism, Bandura (1977) continues to recognize the need for more study in the area of symbolism and as it relates to self efficacy when he stated, “Our theories of psychology should adapt to the new realities . . . We have a vast new world of images brought into our sitting rooms electronically” (as cited in Pajares, 2004). The nature of education is also changing with the advancement of technological images recognized by Bandura when he stated,

Educational practices should be gauged not only by the skills and knowledge they impart for present use but also by what they do to children's beliefs about their capabilities, which affects how they approach the future. Students who develop a strong sense of self-efficacy are well equipped to educate themselves when they have to rely on their own initiative. (As cited in Pajares, 2004)

Environment and Cognition: Piaget

Recognizing that the environment is changing not only in homes, but also in schools, supports Bandura’s (1977) past and current work, and interestingly relates to a developmental perspective studied by Jean Piaget (1965), based on how cognitive development in children is affected by the environment. Piaget was one of the first to recognize that the antics of children were not just cute, but a source of information to be studied and recorded. Einstein called it a

discovery “so simple that only a genius could think of it” (cited in Papert, 1999); “a genius who exceeded himself and found more than he was looking for” (Kegan, 1982, p. 26).

The first intelligence test, a conjoined effort by Alfred Binet and Theophile Simon (Santrock, 1999, p. 156) recorded the correct answers in a laboratory study conducted in Paris in 1904. Piaget (1965) worked on the project, but found another use for the answers by studying the incorrect responses given by the children in the study. He reasoned that a true/false answer did not fully capture what was behind the thinking that went into the answer; it was based on the limited knowledge accumulated by the child. Adult standards dictated a specific answer, but from the child’s way of knowing, although contradictory, the response was reasonable.

Earlier studies in Paris along with observations and recordings from the development of his own three children in Switzerland led Piaget to believe that children do not process information in the same manner as adults. Openly admitting that he was not an educator, Piaget (1965) stressed, “Children have a real understanding only of that which they invent themselves, and each time that we try to teach them something too quickly, we keep them from reinventing it themselves” (cited in Papert, 1999). The availability of Piaget’s work did not reach the United States until the 1960s, despite the development of his work in the 1920s, due to insufficient availability of the translations.

According to Piaget’s (1965) theory of cognitive development, children change with age, evolving and growing through stages. Bandura (1977), Erikson (1950), and Freud (1933) also promoted stage development theories, sharing similarities with the crises aspect, as Piaget espoused with his theory. Passing through the stages of thinking from infancy to adolescence requires the ability to adapt to the environment (Santrock, 1999), through what Piaget (1965)

described as assimilation and accommodation, “A child’s thinking process gradually shifts from concrete to abstract intellectual functioning” (Dembo, 1994, p. 354).

In regards to Piaget’s theory, the brain functions in a specific way to process environmental experiences. The organizational function of the brain operates in a three stage information processing model to create schema, the internal knowledge structure. As new information is assimilated from the environment into the existing structure of the brain, the schema, it is compared to the old information that has been previously stored. The sensory registry process (Santrock, 1999) of the brain in the first stage, the *input* stage, picks up everything from seeing, hearing, feeling, smelling, and tasting external stimuli. New information links to old information as the human process of storing information develops the process of learning (Dembo, 1994). In one to four seconds the new input of information created from external stimuli may decay or reach the second stage, *short term memory (STM)*, if interesting or important. STM storage lasts close to 20 seconds depending on repetition and continuity using patterns. By chunking information in patterns, the brain then transfers STM of information from external stimuli into the third and final stage, *long term memory (LTM)*. The unlimited capacity of LTM, storage for long term use, is created by linkage of old and new information from external stimuli through the environment (Piaget, 1965).

All organisms must adapt to the environment, especially human beings, so by taking it all in, the assimilation process, and then using it, the accommodation process, the human organism adapts, progressing to higher levels of thinking skills: abstract reasoning (Dembo, 1994; Santrock, 1999). The sequence of the four stages of development in Piaget’s theory is the same for all children, with cognitive performance and cognitive development dependant upon each

other (Gardner, 1983, p. 19). Parts of the previous stage are incorporated into the successive stages with four influential factors: maturation, physical experience, social transmission, and equilibration, explained as the adaption of assimilation and accommodation (Piaget, 1965).

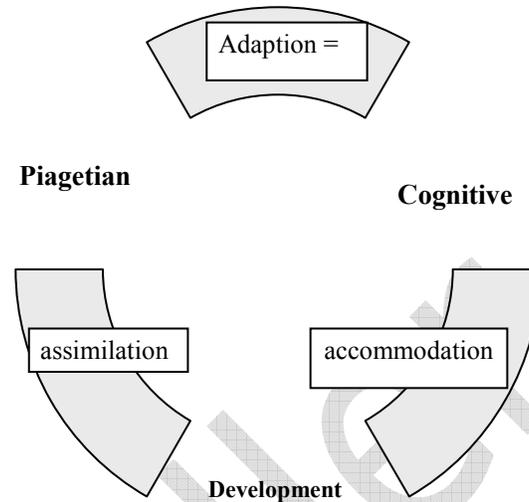


Figure 2: Cognitive performance and cognitive development are dependent upon each other (Piaget, 1965).

The crisis of each stage, according to Piaget (1965), comes when there is no longer the comfort of equilibrium, creating a challenge to reach a higher level. Beginning with the *sensorimotor* stage, birth to two years, infants and toddlers think with their eyes, ears, hands, and other motor activities. As toddlers become comfortable with each new challenge through support of the caretakers, the development through experiences from the environment become part of the behavior patterns (Dembo, 1994; Santrock, 1999). Taking risks with new challenges, disequilibrium leads into the second stage, age two to seven years, called the *preoperational* thought stage, an egocentric period when the child sees the world from their own perspective. The *symbol systems*, adopted by the toddler in the preoperational stage, consist of words, gestures, and pictures that stand for real life objects (Gardner, 1983, p. 19). The development of

mental operations takes place simultaneously, within the mind of the toddler, perhaps through imagery, according to Piaget (1965). The next stage of the Piagetian theory does not occur until after the age of six or seven, but critics offer empirical evidence to the contrary, “There is now evidence that children can conserve numbers, classify consistently, and abandon egocentrism as early as the age of three—findings in no way predicted (or even allowed) by Piaget’s theory” (Gardner, 1993, p. 20).

Children at the age of six/seven to eleven/twelve begin to take other perspectives into account, reaching the third stage of Piaget’s theory, the *concrete operational* stage. When a child can do mentally what was done physically before in the preoperational stage (Santrock, 1999), then concrete operational thought processes are possible. Reversibility is an important step at the third stage of cognitive development, leading into the last stage beyond the age of eleven/twelve to adult. At the last stage, that of *formal operational* development, abstract thought processes are a capability (Dembo, 1994; Santrock, 1999). The critics of Piaget’s theory attack the last stage with the argument, “Research has shown that Piaget may have overestimated the ability of adolescents and adults to use formal operations thinking” (Dembo, 1994, p. 364).

Despite the arguments against specifics of the Piagetian theory of cognitive development, the broad perspectives and contributions to the thought processes of children and how they differ from adult processes remain valuable (Gardner, 1983, p. 20). Piaget’s (1965) theory gives social scientists like Howard Gardner (1983, 1993) reasons to continue to examine, test, and develop new theories in support or opposition of the classical theories. Social change challenges create avenues for growth and improvement as new theories develop.

Multiple Intelligences: Gardner

Under the tutorage of Erikson (1950), and influenced by the writings of Piaget (1965), Howard Gardner (1983, 1993) developed a love of the social sciences at Harvard University. Gardner thrived in the university setting, despite a childhood withdrawn from socialization due to color blindness, myopia, and a lack of interest in outdoor activities. Acquiring knowledge from every aspect of academia not limited to any one particular field of study, Gardner was asked to narrow the focus of his study. Two distinct areas of interest were both symbol systems of words and music (Bandura, 1977; Gardner, 1983, 1993), with a love for writing and synthesizing, thus encouraging research tendencies. A psychological theory emerged combining two studies, one which explored the cognitive development of healthy and gifted children, and the other where he studied the breakdown of cognitive brain functions in adults (Gardner, 1983, 1993).

Figure 3 on page 16 illustrates that there are seven intellectual regions in which most human beings have the potential for solid advancement (Gardner, 1983, 1993). The seven regions include *verbal/linguistic*: learning through the spoken and written word, always valued in the traditional classroom and in traditional assessments of intelligence and achievement; and *mathematical/logical*: learning through reasoning and problem solving; highly valued in the traditional classroom where students are asked to adapt to logically sequenced delivery of instruction, already incorporated in learning organizations.

The less commonly known intelligences present a more balanced view of human characteristics, and include *visual/spatial*: learning visually and organizing ideas spatially by

seeing concepts in action in order to understand them, ability to *see* things in the mind in planning to create a product or solve a problem; *bodily kinesthetic*: learning through interaction with the environment, but not the domain of *overly active* learners, promoting understanding

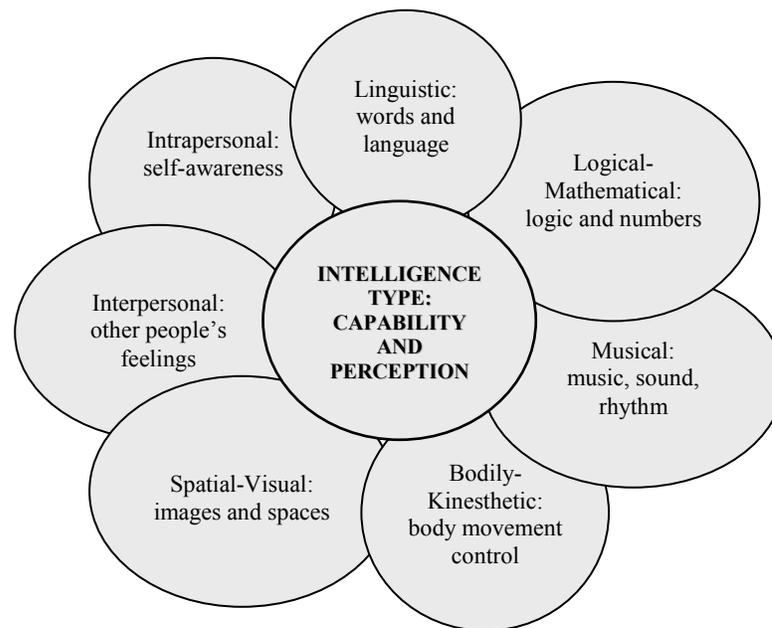


Figure 3: There are seven intellectual regions in which most human beings have the potential for solid advancement and motivation (Gardner, 1983, 1993).

through concrete experience; *musical/rhythmic*: learning through patterns, rhythms, and music including not only auditory learning, but identifying patterns through all five senses;

intrapersonal: learning through feelings, values, and attitudes, a component of learning where students place value on what is learned and take ownership for the learning; and *interpersonal*:

learning through interaction with others, but not the domain of children who are simply *talkative* or *overly social*, promotes collaboration and working cooperatively with others.

As with each new theory, challenges have been made to include two new intellectual regions for the potential for advancement and motivation, but Gardner (1999) is not ready to expand on the original theory of seven intellectual regions. The two new areas, in Gardner's opinion, fall under the categories of the other intelligences. The new intellectual regions to consider are *naturalist*: learning through classification, categories and hierarchies by picking up on subtle differences in meaning, not simply the study of nature, and can be used in all areas of study; and *existentialist* (referred to by some as spiritualist): learning by seeing the *big picture*, and seeking connections to real world understandings and applications of new learning by asking the questions *Why are we here? What is my role in the world? What is my place in my family, school and community?*

Gardner's theory on multiple intelligences was a contribution to psychology, however education and teaching and training communities in industry soon embraced it. It took on unexpected implications in the education community, causing controversy along the way much like the controversy that surrounds any new theory upon initial development. Simply stated, Gardner's Theory of Multiple Intelligences (MI) claims that "seven 'core' forms of intelligences are an effort to lay out seven intellectual regions in which most human beings have the potential for solid advancement" (Gardner, 1983, p. 372).

Defining *intelligence* became the initial criteria for the development of the theory. According to Gardner (1983, 1993), previous to MI theory, intelligence focused on what works best for a law professor, using a combination of linguistic and logical intelligence, only two intellectual strengths. A working definition of *intelligence* developed and used by Gardner incorporates a more holistic approach, "the ability to solve problems, or create products, that are

valued within one or more cultural settings—a definition that says nothing about either the sources of these abilities or the proper means of ‘testing’ them” (Introduction: 10th anniversary edition, p. x). Considering the strengths in more holistic human beings and not just the law professor types that use linguistic and logical intelligence, spatial, bodily kinesthetic, musical, interpersonal, and intrapersonal strengths present a more balanced view of human characteristics. “Human beings have evolved to exhibit several intelligences and not to draw variously on one flexible intelligence” (Gardner, 1983, p. xii).

Through research that began in 1979 for the Project on Human Potential, Gardner (1983, 1993), a Harvard graduate student, focused his study of intelligence, “on two assumptions: first, that it is a single, general capacity that every human being possesses to a greater or lesser extent; and that, however defined, it cannot be measured by standardized verbal instruments, such as short answer, paper and pencil tests” (Gardner, 1993, p. x). Inspired by the work of the Soviet psychologist Lev Vygotsky (1978) who espoused learning to differences among the practices in cultures, Gardner recognized that various cultural experiences enhance the growing child. Working under the umbrella of a well funded, extensive project with teams of consultants in Egypt, India, Japan, Mexico, the People’s Republic of China, and West Africa, the five year period of the project provided a plethora of cultural backgrounds for reference. “I have based MI theory upon neurological, evolutionary, and cross cultural evidence” (Gardner, 1993, p. xii).

The work for the project was guided under the directive of the international nonprofit organization, The Bernard van Leer Foundation of The Hague, Netherlands, seeking to further the potential of disadvantaged children (Gardner, 1983, 1993). The availability of resources through the project provided a distinct advantage to Gardner’s research. “Reviews of relevant

literature in history, philosophy, and the natural and social sciences, a series of international workshops on conceptions of human development in diverse cultural traditions, and the commissioning of papers and books,” (Gardner, 1993, p. xxxi), along with investigators in a variety of fields and interests were readily available for consultation.

Gardner’s new intelligence theory took into consideration the effects from genetics and environmental influences by culture, a concept shared by Bandura (1977) and Piaget (1965), creating differences in intellectual profiles. The Binet IQ test once considered the norm for intelligence tests was again questioned, as it was questioned by Piaget (1965). Regarding the IQ test scores, Gardner (1983, 1993) writes, “It does predict one’s ability to handle school subjects, though it foretells little of success in later life” (p. 3). Attempts to measure *raw* intelligence in the early development of the theory became impossible, reflecting a shift in the philosophy of assessment. Gardner (1983, 1993) admitted to his own confusion, as readers of the 1983 MI theory seemed confused, “leading to confusion among readers, and not infrequently within my own thinking” (p. xvi) that, “in 1983 I centered the multiple intelligences far more within the skull of the single individual than I would one decade later” (Gardner, 1993, p. xiv).

The opportunity for success is not lost for adolescents who score low on the IQ test due to struggles with educational, emotional, financial, cultural, or familial difficulties. Exposure to solving the practical problems of the every day world offers another venue for success and happiness leading to the social development of comprehension and the decision making process, often outside of the school environment (Bandura, 1977; Gardner, 1993; Piaget, 1965).

If adolescent impulsivity blocks the social development of comprehension and the decision making process, inside or outside of the school environment, then the capacity to solve

problems is interrupted, leading to a crisis (Erikson, 1950; Freud, 1933/1980; Maslow, 1968).

The crisis involves intelligence, according to Gardner's (1993) definition of intelligence, "the capacity to solve problems . . ." (Introduction: 10th anniversary ed., p. x), and the *Merriam-Webster's Collegiate Dictionary Eleventh Edition* (2003) definition, "the ability to learn or understand or to deal with new or trying situations: reason" (p. 650). As adolescents encounter new or trying situations from the environment, the central nervous system attempts to process the crisis. An explanation of the functions of the central nervous system aids in understanding the relationship between adolescent impulsivity and the development of abstract cognition.

Gardner argues, "Neurobiology research indicates that learning is an outcome of the modifications in the synaptic connections between cells. Various types of learning results in synaptic connections in different areas of the brain" (Introduction, p. x). The interesting chemical substance found in the brain in 1960 called serotonin has since found a relationship with neurotransmission, synapse connection, self esteem, and adolescent impulsivity and decision making.

Using brain research and informational processing examples of intelligence, cognition, and neurotransmitter research, serotonin is under considerable scrutiny as a possible connection to the signals in the brain across synapses that affect adolescent impulsive decision making. Contemporary social scientists consider gender, ethnicity, intelligence, and self-esteem as influential factors in adolescence related to impulsive decision making. Necessary background from current research is provided to link serotonin levels to reasonable explanations for impulsivity in the decision making process of teenagers, indicating a need for further research.

Unhealthy thinking patterns affect the ability to learn and block the development of abstract cognition. Without higher level thinking skills to process decisions that lead into the healthy development of adulthood, crises may block development and developmental delays may interrupt intellectual growth and full potential for learning and motivation. The early, middle, and late stages of adolescence are the breeding grounds for abstract cognitive development leading to the autonomy of adulthood. If thinking patterns are adrift in a negative direction, then learning is unreachable. Details of developmental delays and interruptions to intellectual growth are further described in the Depth section.

There was no direct educational implication in Gardner's psychological theory in 1983, but the implication for social change was imminent. Educational systems currently focus on learners who use only two intelligences, linguistic and logical. MI theory incorporates several types of learners, instilling a cry for a more balanced system of instruction that could benefit all types of learners. The possible impact on education is huge, providing MI theory is accepted. Gardner's (1983, 1993) work continues to study MI theory and education, "Much of the work my colleagues and I have undertaken in the past decade has examined educational implications of MI theory" (p. xv). The didactical system of teaching previously accepted as the only approach in educational institutions could virtually be changed forever.

Conclusion

The relationship between intelligence, learning, and motivation are but a few of the influential factors imposed as learning institutions attempt to balance teaching styles and the learning capabilities of all students. How human beings understand and process information was explained in the Breadth section through the explanations of the theories of intelligence and

cognition by Bandura (1977), Gardner (1983, 1993), and Piaget (1965). In order to form realistic goals for the future as a successful adult, students need to develop schema on which to attach the necessary tools to reach full intellectual potential for learning and motivation. Learning cannot emerge from talking about doing things, but from the actual process of doing things, so adolescents test what they learn by *doing things*.

The mainstreaming of special education students into regular education classrooms is an urgent social issue in education that spans two decades. A deeper understanding of intelligence, learning, and motivation provides answers for better possibilities to adapt regular education classrooms. A need for an understanding that it is not as difficult as once perceived to adapt current curricular practices is critical to teaching and learning organizations. As individuals, it is necessary to choose a path for the future using the tools given by parents, teachers, and guardians. As theories develop and evolve in the cycle of learning seeking truths, only to be tested, challenged, and redeveloped by social scientists seeking improvement, the process of human learning continues to evolve and improve. Social change challenges create avenues for growth and improvement as new theories develop.

The KAM 5 Depth section will discuss that differences exist in the categories of intelligences, learning, and motivation between the general capable population of students and the students identified with learning disabilities. Guidelines provided by theorists are needed to aid in the understanding of the learning process, and current scholarly literature in the annotated references will support the finding with empirical evidence that relate to the theories described in KAM 5 Breadth.

Learning, a human process for storing information, was the apex of life according to the early Greeks, Plato, and Aristotle. All students possess the capabilities to learn, even if the educators do not fully understand the learning styles of all levels of learners. The Application section of KAM 5 will further explain the differences in learning styles, and will include a video demonstration of different styles of learning in a high school classroom science lesson based on Gardner's Multiple Intelligences (1983, 1993).

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Knowledge Area Module 5

Theories of Intelligence,
Learning, and Motivation for Persons with Special Needs

Depth Component

EDUC 8521: Educators as Facilitators of
Inclusive Learning in Varied Educational Environments

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Annotated References	01
Introduction	17
Overview of Adolescent Development	17
Environmental and Physical Development Factors	18
Parental, Peer, and Psychosocial Developmental Influences	26
Neurotransmitter Affects on Intelligence and Cognition	40
Conclusion	49
References	53

Depth Annotated References

Askenazy, F. (2002). Anxiety and impulsivity levels identify relevant subtypes in adolescents with at risk behavior. *Journal of Affective Disorders*, 74, 219-227.

The study conducted by the author examines the controversial relationship between anxiety and impulsivity in at risk adolescents between the ages of 12-18, admitted to a psychiatric unit for more than 48 hours. The need to predict serious risks of suicide and/or violence prompted interviews that were conducted upon admittance. The American Psychiatric Association (APA) disorders (DSM-IV) criteria were used as a trained and experienced psychiatrist interviewed each patient for degrees of anxiety and impulsivity. The interview results were compiled and Chi square tests were used to compare qualitative variables from the 69 inpatient interviews.

All patients exhibited conduct disorders, but not all resulted in anxiety and impulsivity. Only 30% of the patients were both anxious and impulsive. Three limitations of the study affect the findings, encouraging follow up studies to further confirm the results without hidden biases. The sample size was too small, the population does not represent the general population, and the lack of long term data does not allow for longitudinal stability of the results.

The value of the results to the general public is minimal other than pointing out the need for further study into the behavior of at risk adolescents. It became readily apparent that the admittance to a psychiatric unit constitutes concern prompting a need to monitor impulsivity in students that show signs of behavior outside the norm. Impulsivity in adolescents left out of control may lead to at risk behavior and at risk behavior may lead to harmful practices which will block the ability to develop skills in learning and motivation.

Bacchini, D., & Magliulo, F. (2003). Self-image and perceived self-efficacy during adolescence. *Journal of Youth and Adolescence*, 32, 337-350.

In this refereed journal article, the authors report results from cross sectional research using two constructs of self image and self efficacy during adolescence to evaluate three objectives. The objectives considered (1) if changes exist in personal descriptions over time, (2) do the constructs overlap, and (3) an evaluative comparison of a study from seven years previous to the current research. Gender, age, residential zone, and kind of school are quantified in the results relating societal, peers, personal, and family issues as influential factors, using graphs and charts through a multivariate analysis.

Findings indicating that adolescent' perceptions of self are multidimensional offer valuable information to educators, youth counselors, parents, and interested researchers in the ways youth evaluate themselves and others. Previous research related to studies from Erikson, Maslow, and Bandura validates the work done by the authors revealing that youth generally have positive feelings, evolving through phases of development. As higher order thinking skills develop, the once negative early adolescent aspects change to a more positive integrated concept. Comparisons to classical theorists present valuable insight to adolescent development.

The authors restrict the consideration of self concepts from a phenomenological point of view, limiting the beliefs of the self assessments of individuals that result in a distance between the actual self and the ideal self. The multiple statistical conclusions lead to confusion. The questionnaire is named, but details are not disclosed. The comparison study is not longitudinal, where no subject from the first study could still be present in the second study, raising doubt as to why the studies were compared, and to the reliability of the study results.

Bednar, D., & Fisher, T. (2003). Peer referencing in adolescent decision making as a function of perceived parenting style. *Adolescence*, 38(152), 607-622.

The research question of whether the style of parenting influences the decisions of youths made in late adolescence was examined in the study. The perception of the style by the adolescents may differ from what the parents believe to be the style utilized. Four parenting styles are identified, authoritative, authoritarian, permissive, and neglecting/rejecting, through a questionnaire given to 262 general psychology students who live with parents and commute to college. Basing the choice to survey older adolescents on the premise that the decision making process rarely changes from early adolescence to late adolescents, the older group was chosen.

Statistical analyses using multiple regression with data collection showed that responsiveness, a dimension of parenting that encourages individuality and self regulation, significantly influences the choice of decision making assistance the adolescent seeks. Regardless of parenting style, the teen most likely chooses peers for making social decisions, but the choice is less clear when moral or informational decisions are formed, dependant on parenting style.

The data are skewed due to the overwhelming response of the authoritative style of parenting determined by the questionnaire, explaining why more moral and informational decisions are likely directed to authoritative parents over friends. Parents, adults outside of family, and peers are all listed as references for adolescents, but other adults are not mentioned in the study results.

Peer group association researchers seeking a focus can look to the results for help in choosing an area of need. Involving at risk adolescents under negative parental influence with a positive peer group could counteract the lack of direction necessary for proper decision making.

Betts, D. (2003). The political realities of providing services to individuals with disabilities. *Educational Horizons*, 81, 67-68.

The author uses the article to ask pertinent questions as to the best approach for providing special education services, by reviewing several articles from the previous issue of the *Educational Horizons* magazine. Educators and parents should understand the political limitations of developing Individualized Educational Programs (IEPs), and asking for a coordination scheme, in fact, brings out the fact that if government agencies acted in the best interests of the students then a coordinated effort would already take place. It does not.

The hidden biases of the article surface when the credentials of the author are listed, as an administrator of special education, but despite bias, the author's citations add credence to the information. The author states that politics gets in the way of what is best for the students when the IEP team must sacrifice student needs for political agendas. Calling out the flaws by stating that the interfering factors should be identified and fixed, whether the flaws are political or not gives credibility to the article. There is hope for the school system, according to Betts, but organizational goals must be identified and program and system changes met if the students with disabilities are to receive what is fair and just in education.

The education and service needs of individuals with disabilities are neglected, according to the article. Parents, educators, school systems analysts, and any IEP team members will find the information thought provoking as political inferences are implied to be the problems of what stands in the way of student progress. Central to the message about school experiences is to find what works best for each individual, despite the political roadblocks. Perhaps considering these issues can help to ensure that we are helping, and not neglecting the students with special needs.

Bradley, R. (2005). Response to intervention. *Journal of Learning Disabilities*, 38 (6), 485-486.

The author examines the only disability category for which eligibility is required in the Individuals with Disabilities Education Act (IDEA), and seeks to find options suitable to recommend change. Also known as P.L. 94-142, IDEA has been criticized for the lack of explicit eligibility requirements, leaving individual states to set their own criteria. The ambiguity leaves the national special education program in a state of confusion, in need of more concrete guidelines for eligibility asking the question: are the right students declared eligible for special education support in a timely fashion? The current answer is no, the students are not properly being identified.

The article clearly states the problem, and recommends an alternate plan for identifying students for eligibility outside the present use of the comparison between IQ test scores and academic discrepancies. The response to intervention (RTI) program examines changes in the regular education curriculum environment for a student, followed by an evaluation, before special education services are considered. The explicit bias is evident as the author is a research analyst at the Office of Special Education Programs. Despite the bias, the author presents the critical need for universal changes in the identification of students for the special education program. In text citations are used to substantiate the opinions of the author, adding credibility and reliability to the information presented. A reference list is included to easily check the sources.

The article presents critical information to the special education program placement of students in need of services nationwide. Special educators, counselors, parents, regular education, and special education teachers will benefit from the possibility of new eligibility.

Cheyne, J. (1999). Dialogue, difference, and the “Third Voice” in the zone of proximal development. *Theory and Psychology*, 9, 5-28.

A detailed examination of thinking and speech are outlined in this journal article, looking into ways in which parents, teachers, mentors, and tutors can more effectively assist learners. By comparing the concepts of Mikhail Bakhtin and Lev Vygotsky regarding the characteristics of speech and thought, the author considers a broader scope for the Zone of Proximal Development (ZPD) as it relates to individual socialization and cultural and historical change. Using examples from literature and history Cheyne quotes Tolstoy, relating scaffolding instruction to ZPD as an explanation of how ZPD can be understood and used to further learning experiences.

Well documented with an extensive reference list, the article offers suggestions that may affect social change in ways that educators perceive learner capabilities. Classical theory is used to understand contemporary needs with a compare and contrast format. Empirical evidence is cited for easy reference. Technical psychological language and inferences require repetitive readings for a clearer understanding of concepts, but are worth the time invested. Different dialogues are defined and perceived from a psychological point of view which may not be easily understood from a mainstream perspective, leaving the concepts open for criticism.

Technological advances suggesting a paradigm shift for the new millennium requiring workers to be self starters with abilities to think independently face educators. Dynamic ideas are needed to prepare learners for the individual socialization and cultural and historical changes ahead. The article suggests methods in speech and thought processing, internal and external, as alternatives to meet 21st century demands. Further studies into intelligence, learning, and motivational aspects of abstract thought processing can emerge as a natural progression from the study.

Feden, P. (2006). On balance: Fiction high school: where things have to make sense. *Educational Horizons*, 84, 79-85.

The author cleverly took the topic of classical and contemporary human learning and applied it to a fictional high school setting where the best case scenario of teaching and learning is applied to make sense of education. The premise incorporates five major areas of human learning: nature of intelligence, motivation of students, the way students learn, what students should learn, and how learning should be assessed. Each area compares current pedagogical practices vs. what should/could be done in education to improve learning, based on the most current research. The end result is a guideline to follow for the ultimate educational experience for students if teachers collectively consider the ideas and use them, as students deserve no less.

The author bases the five major ideas on classical theories, citing Piaget, Vygotsky, and Gardner, but frequently quotes contemporary theorists, as well. The article is written from the point of view that current educators are not incorporating the best approach to teaching and learning, and the parodic endeavor may be too coarse for some educators. The qualitative analysis incorporates humor balanced with factual evidence, leaving no doubts as to the source of evidence with a detailed reference list included.

High school is the last stage of education before the real world experience challenges many students. The article offers insight into what students may face in the real world, outside the sheltered walls of school life, and how educators need to rise to the challenge of preparing for the 21st century. Bridging the gap between school and the community by abandoning past practices for new innovative teaching takes courage. The article carefully designs a fictional situation, but strongly suggests educators pay attention to the concepts, based on current research.

Fessler, D. (2001). Emotions and cost benefit assessment: the role of shame and self-esteem in risk taking. *US: The MIT Press*, 191-214.

Approval seeking behavior is part of the environment in which humans evolve and that kind of behavior fosters risk taking. An ethnographic study was conducted by the author to determine the degree of the role of emotions in the scheme of risk taking behavior. Is it worth the risk, and at what cost? Emotions are never wrong, but what is done with the emotions can influence the outcome of an event, ultimately affecting self-esteem. The study found that with strong self-esteem the emotions of shame and pride are less frequently influential in the learning process of acquiring higher order thinking skills.

The article combines the background of human development with the natural occurrence of emotions to determine if self-esteem is affected when risks are taken. Observations within the environment of the participants produce results indicating that cost-benefit assessment is a strong consideration. Along with emotions, the study suggests that the role of the neurotransmission of serotonin is a key factor in self-esteem. The details of the role of serotonin are too brief leaving more questions than answers.

The benefit of the study with more questions than answers leaves an open door for future research into the serotonin effect on self-esteem. What is serotonin and where it comes from needs to be researched before the study results can be considered valid or reliable with the mere mention of the neurotransmitter. Observational studies involving emotions can benefit from the results of the study, applicable to any age group as emotions fall into all age groups. Self-esteem results fit more easily into an adolescent to adult age group, and studies that involve self-esteem effects on learning and motivation of adolescents can benefit from the study.

Hollin, C. (2003). Aggression replacement training: Putting theory and research to work. *Reclaiming Children and Youth*, 12(3), 132-134.

Rationale for three new components of the tried and tested theory of Aggression Replacement Training (ART), used in the past for working with aggressive youth, is reported in the article. Theoretically based on Bandura's (1973) social learning theory, the idea of ART can be better understood from the author's description of the history of violent behavior. Individuals and the environment are the focus of the study, and the decision making process of thinking through a situation before aggressively acting upon it was studied by the author. Data comparison from previous studies completed by the author was used to report the information for the article. Social cognitive theory proved to be a benefit in working with at risk youth, relating the thinking process to how aggression can be dispelled when environmental factors trigger a potential volatile situation.

The article offers little detail as to the data collection procedures, sample size, or methodology used, but the numerous in text citations from previous studies, and the extensive reference list lends credibility to the information presented. The author is a professor of criminology and psychology, and an editor of a psychological journal, so if a bias is present it is explicit. Replication of the exact study would be difficult, but the availability to check the multiple studies listed is easily accessed through the reference list.

The process of thinking to promote learning and motivation of acceptable behavior to overcome aggressing behavior, the focus of the study, has multiple valuable components.

Teachers, counselors, psychologists, and administrators can all use the article to support the need to demonstrate how thinking before taking action breeds healthy results for individuals affected negatively by environmental stimulants.

Kaplan, Diane S., Kaplan, Howard B. & Liu, X (2001). Influence of parent's self- feelings and expectations on children's academic performance. *Journal of Educational Research*, 94, 360. Retrieved May 11, 2004, from Academic Search Premier database (5032139).

Early adolescence can often times activate a stressful period with regards to relationships between parents and their children when discussing academic performance. Studies conducted from two points of view, the parent's and the child's, show how parental expectations may cause undue stress on their children. The results are from a sample size of 1, 864 pairs of parents over a defined period of time, encompassing two decades, which sufficiently support the authors' conclusions: parents naturally influence their children. The authors found that adolescent children tend to follow or adopt their parents' expectations, as if by osmosis. Parents with high self-esteem project high expectations, thus communicating a positive influence on their adolescent's academic performance. Families with adolescents face daily challenges as the child develops thought processes. Through parent education, increased communication between parent and child, and the elimination of negative self-feelings of the parents and the child, a positive outcome results with elevated academic performance.

The significance of the research comparing links between parent expectation and student achievement is substantiated by the justification of the results, the reciprocity of parent-adolescent relationships, and the methodology used to conduct the research. Additional support from the citations and list of references gives creditability to the information presented.

Although the length of the 180 item questionnaire may be difficult to replicate and interpret, the process of personal interviews counterbalancing the questionnaire displays methodology adaptable for future research.

Kelley, T., & Stack, S. (2000). Thought recognition, locus of control, and adolescent well-being. *Adolescence*, 35, 531-550.

A well known psychological construct, locus of control (LOC), is examined in this article from the point of view of a newly designed psychological paradigm, Psychology of Mind/Health Recognition (POM/HR) focusing on thought recognition. The authors hypothesize that adolescent perceptions of happiness and success, contingent upon LOC, a way of perceiving the world, are often clouded with such superficial emotions as excitement and security. Data collection by the World Value Study Group (1991), an international association of social scientists, compiled information from 17 nations that distributed surveys to 1,892 at risk youths from the ages of 14-20. The findings were reported using statistical analysis, specifically ordinary least square regression on two variables: global happiness and global life satisfaction.

Multiple references, in text citations, limitations, and controls, all with copious examples included, give credibility and reliability to the data collections. Worldwide impact of the results for the adolescent population also lends authenticity to the research, as contemporary and classical theorists are quoted for reference.

The research indicates the belief exists that not only at risk adolescents falter, but sometime in life, all human beings are tempted and may cave into negative pressure from outside sources, or from within their own personal individual thought processes. Three distinct areas give value to the article for use with work in adolescent studies : (1) recognition of the intrinsic value of humanity born good and wholesome with the capacity to attain psychological health, (2) that two processes of thinking exist: process thinking (acquired ability) and free flowing thinking (innate source of profound human intelligence), and (3) stress and distress are functions of the abuse of process thinking, causing the innate thought processes to drift into an unhealthy pattern.

Kim, K., Conger, R., Elder, G. Jr., & Lorenz, F. (2003). Reciprocal influences between stressful life events and adolescent internalizing and externalizing problems. *Child Development*, 74(1), 127-144.

A six year longitudinal study was conducted by the authors to determine if factors in the relationship between stressful events in the life of adolescents and adjustments that may be made because of the events were interrelated. Over time, it was determined that the two forms of maladjustment in the lives of adolescents, internalizing and externalizing problems, were reciprocally interrelated as a result of the study. Autoregressive analyses indicated that students in the 7th through 12th grades who were subjected to stressful events were prone to increased risks for emotional and behavioral problems. As a result, the ability to learn was affected, creating additional problems for motivation in a school environment.

An extensive reference list and in text citations give credibility to the study. Numerous examples to related studies were used to cross reference the data collection from over 400 participants, 215 males and 236 females. A common limitation that occurs with any multiyear study surfaced due to missing data. As a study participant left or moved away before the completion of the study, the data had to be declared inconclusive. The expectation maximization (EM) algorithm was used to deal with the problem of the missing data, thus avoiding a hidden bias. There were no biases identified due to gender issues, and the sample sizes for both males and females were nearly equal.

The results of the study are useful for educators, counselors, psychiatrists, and psychologists interested in behavior outcomes of adolescents due to stressful life events. Related to behavioral outcomes, the learning and motivational outcomes may be significantly affected in making decisions for proper placement of students with a history of stressful life events.

Marston, D. (2005). Tiers of intervention in responsiveness to intervention: Prevention outcomes and learning disabilities identification patterns. *Journal of Learning Disabilities*, 38 (6), 539-544.

The author examines a previous article that studied the only disability category for which eligibility is required in the Individuals with Disabilities Education Act (IDEA) seeking to find options suitable to recommend change. The Response to Intervention (RTI) models are incorporated into the general education curriculum and evaluated as to student performance and success. This article critically analyzes determining the number of tiers of intervention before special education is considered. Three studies of RTI were examined over a 10 year period in some cases, leading to the conclusion that (a) eligibility criteria for special education services should be multidimensional, (b) 40% of the students receiving tier 3 interventions maintained average performances without additional assistance, and (c) placements in special education decreased at all grade levels.

The author uses charts to add clarification to the statistical results, and adds reliability and credibility to the citations with an extensive reference list. The hidden bias lies in the credentials of the author as having written several articles in regards to special education, curriculum based management, and problem solving models. Despite the hidden biases, the article adds credence to the need for intervention models to aid in the identification of students for support services from the special education programs. Currently, the special education programs are impacted, in need of change so that students are properly placed in a timely fashion.

The article presents invaluable information as to a new focus in special education eligibility requirements that looks at regular education placement with modifications.

Nguyen, T. (2002). Differential effects of a multiple intelligences curriculum on student performance (Doctoral dissertation, Harvard University, 2002). Retrieved on December 16, 2004, from www.dissertation.com/library/1121504a.htm

The doctoral dissertation study conducted by Nguyen in 2002 examines the existing views of Howard Gardner's (1983) Multiple Intelligences (MI) through a comparative quantitative study. The intention of the researcher was to compare the application of the theory through the use of MI concepts used by teachers with and without MI background. The null hypothesis was accepted, as the statistical conclusions revealed there was not a major difference in the grades of the two comparison groups of students over a five year period of time.

A teacher program grant provided the guidelines for the study, revealing that a hidden bias exists. The study results were examined through the CAT/5 fundamental features of measurement, looking at how the MI theory and concepts affected student achievement on standardized tests. There were no deficiencies in the literature listed in the dissertation therefore the question as to why the study was conducted arose. The obviousness of a need for the study was presented through the results of similar studies presented in Chapter 2 (p. 4).

The author presented the value of the dissertation study by using charts and graph of the results which support the value of the MI theory. The charted grades for the two groups of students in the study, one group taught with the MI concepts, and the other group without, revealed little difference. The author pointed out that the value of the study supported the use of MI concepts because if little difference exists between the groups, then the MI concepts are adequate for teaching and learning practices. The conclusions revealed that more studies are needed for teachers, administrators, and curriculum specialists to benefit from the results, to substantiate the use of MI concepts with current curriculum practices.

Reschly, D. (2005). Learning disabilities identification: Primary intervention, secondary intervention, and then what? *Journal of Learning Disabilities*, 38, (6), 510-515.

The author examines the status of student identification for a specific learning disability as described in the Individuals with Disabilities Education Act (IDEA) 2004. It is currently unclear with IDEA 2004 of what to do for struggling students after the first steps of prevention, and then prevention with eligibility determination are complete. If a specific learning disability is not properly addressed after the first two tiers of intervention, the author suggests an intervention that includes behavioral issues related to attention deficits. The alternatives of how to proceed after Tiers 1 and 2 are varied, leaving the state of the student identification process in disarray. The author uses ample in text citations to support the prognosis of the process.

Charts used in the article aid in the discussion of the need to reach a consensus in the identification of specific learning disabilities, depicting how the process of the tiers of intervention are currently used. The author's credentials present a hidden bias, but the extensive reference list counterbalances the bias with credible sources. Suggestions for alternatives to the *what next* dilemma are varied, not limited to just the opinions of the author, adding reliability and validity to the information presented.

A hot topic in education today involves the issue of how to reach and teach students identified with a specific learning disability. The article addresses the issue with the preclusion: how to properly identify a specific learning disability, and what can be done before admission into the special education program becomes necessary. Invaluable information to educators, parents, counselors, psychologists, and behavior management program specialists is offered as alternative suggestions for interventions. Specifically behavior management in relation to attention and learning is a key issue to consider; an issue that has been neglected in the past.

Snowden, J. (2003). The effects of inclusion on the anxiety and self-esteem of special education students in the regular education classroom. (Doctoral dissertation, Walden University, 2003). (UMI No. 3106558)

The doctoral dissertation study conducted by Snowden in 2003 examines the special education community of learners through a mixed quantitative and qualitative study. The intention of the researcher was to compare the anxiety and self-esteem of inclusion special education students mainstreamed into the regular education environment. The Individuals with Disabilities in Education Act (IDEA) (1965), along with school reform studies prompted the author to examine the emotional impact on the students as a result of placement outside of the special education classrooms. There were no predictions made, and the conclusions were applicable to the special education and regular education educators.

The small sample size of the study within one small district was listed by the author as a definite limitation to the study for replication. Critical to the study was the inclusion and mainstream mindset of the faculty (p. 4). The student interviews provided valuable information into the relationship of how the initial interaction of the teachers with the students in the first few days of the inclusion process had a profound affect on the student success. If teachers were uncomfortable with the mainstreaming of special education students, it was evident to the students that were placed in the classroom of the teacher with reservations.

The researcher provides valuable insight into the process of mainstreaming students through the federal mandates. The law states that no more choices are available, and that all students regardless of disabilities will be placed in the inclusive environment. Regardless of the misconceptions of how special education students learn, the least restrictive environment, the mainstream classroom, must be provided to the students. More studies are needed.

Depth Component

Introduction

The Depth component of KAM 5 will examine factors affecting learning and motivation for special needs students by first considering the cognitive theories of Albert Bandura (1977), Howard Gardner (1983, 1993), and Jean Piaget (1962) as described in the Breadth section. Focusing on strengths and not weaknesses supports the belief that all student can learn, even though individual student learning styles may not be familiar to all classroom educators. A summary of how intellectual capabilities for students with identified disabilities are different from regular students, using current empirical evidence found in scholarly journals and articles will follow.

The placement, assimilation, and assessment of students with special needs requires an understanding of the different styles of intelligence, learning, and motivation of the mainstreamed special education students currently enrolled in the regular education classrooms. Without a clear understanding of how students learn, there are risks for unsuccessful results that threaten the integrated environment of educational institutions.

Overview of Cognitive Development

Sometime during adolescence cognitive, physical, and emotional development comes to a maturation point for the first time. Discoveries in brain research, emotional development, motivation, and informational processing offer suggestions as to what may cause individuals to do what they do. If cognitive functions are misunderstood or misinterpreted in regular education students or in special education students, negative outcomes may result. Teaching management

and balance to educators and students is essential in the process of understanding cognitive development, learning, and motivation (Maslow, 1968).

Empirical evidence is developed by theorists and tested by social scientists concerning intellectual development which provides reasonable explanations for learning and motivation so that management and balance can be attained, “One has to see correctly before one can act correctly” (Kilpatrick, 1992, p.133). Albert Bandura (1977), Howard Gardner (1993), and Jean Piaget (1965) studied cognitive development, while examining theories by Eric Erikson (1950), Sigmund Freud (1933/1980), and Abraham Maslow (1968), and then devised new theories to support a better understanding of human cognitive development. Recognizing that levels of cognitive skills differ is an invaluable tool in teaching self reliance and management of learning and motivation to all levels of students.

Theories are used as guidelines and provide general observations that predict behavior, but theories cannot establish criteria for every variable in the human development process. Gender, ethnicity, intelligence, and self-esteem are but a few of the influential factors imposed as young people try to muddle through the obstacles in life in search of individual identity (Santrock, 1999; Sheehy, 1977). Discovering where intellectual development fits in the schema of understanding how learning and motivation differ in individuals requires an examination of details into cognitive, physical, and emotional development. Once identified, teaching management is critical to a clearer understanding of why students with identified disabilities may require alternate methods to the regular curriculum to achieve success.

Environmental and Physical Development Factors

Skills to distinguish between what is meaningful and what may propose a threat in life develop through processes of learning and motivation and develop as second nature if a nurturing environment is provided early in the physical development of a human being (Kegan, 1983; Piaget, 1965). “A child’s thinking process gradually shifts from concrete to abstract intellectual functioning” (Dembo, 1994, p. 354). Abandonment or neglect thwarts the basic nurturing environment, blocking the development of trust between the mother and the infant (Freeman, 1980, p. 120).

The lack of established trust links an unsuccessful journey through Erikson’s (1950) stages of human development with ties to impulsivity and poor decision making skills leading to difficulties with learning and motivation. If a nurturing environment is missing in the early developmental years, then the thinking process is compromised from naturally passing from concrete to abstract intellectual functioning, often times leading to negative thought patterns (Hollin, 2003). The absence of abstract thinking blocks learning and motivation where independence to make healthy decisions and choices is required. Without the skills to make independent decisions through abstract thought processing, students may be evaluated and identified as having needs for special educational services. Once trust is established, abstract thinking skills can be acquired. Assimilation into the regular education environment of learning and motivation, without further special educational assistance (Bradley, 2005; Marston, 2005), will transpire naturally.

Passing through the stages of thinking from infancy to adolescence requires the ability to adapt to the environment (Santrock, 1999), through what Piaget (1965) described as assimilation and accommodation. Openly admitting that he was not an educator, Piaget (1965) stressed,

“Children have a real understanding only of that which they invent themselves, and each time that we try to teach them something too quickly, we keep them from reinventing it themselves” (cited in Papert, 1999). Development through experiences from the environment become part of behavior patterns (Bandura, 1977; Dembo, 1994; Santrock, 1999) if children are exposed to and allowed the experiences through their own invention. If a child is deprived of taking risks with new challenges, then behavior patterns are thwarted, resulting in less than adequate learning and motivational skills to thrive in a regular teaching and learning environment (Hollin, 2003).

Unhealthy thinking patterns affect the ability to learn and block the development of abstract cognition. Without higher level thinking skills to process decisions that lead into the healthy development of adulthood, crises may block development and developmental delays may interrupt intellectual growth and full potential for learning and motivation. The early, middle, and late stages of adolescence are the breeding grounds for abstract cognitive development leading to the autonomy of adulthood. If thinking patterns are adrift in a negative direction, then learning is unreachable (Bacchini & Magliulo, 2003).

Educational systems currently focus on learners who use only two patterns of thinking and intelligence (Gardner, 1983; Senge, 2000), that of linguistic and logical thinking. Thinking patterns affect the ability to learn, thus students outside of the realm of linguistic and logical thinking are blocked from developing abstract cognition that is needed to process learning and motivational skills. Multiple Intelligences (MI) theory developed by Gardner (1983; 1993) incorporates several types of learners, instilling a cry for a more balanced system of instruction that could benefit all types of learners (Nguyen, 2002). The didactical system of teaching previously accepted as the only approach in educational institutions needs revision. Enriching the

educational environment to serve all levels of learners to promote learning and motivation for students previously deprived of the necessary physical stimulation bridges some of the gaps between special education and regular education as discovered in a longitudinal study by Nguyen (2002).

All students possess the capabilities to learn, even if the educators do not fully understand the learning styles of all levels of learners. Somewhere during the late adolescent years if the trust that is of the utmost importance has not been developed from as early as in the infancy stage (Erikson, 1950; Freud, 1933 found in Freeman, 1980), then it comes as no surprise that struggles with learning and motivation exist because there is no trustworthy adult with whom to identify or seek advice. Learning comes from a balance of making mistakes and seeking advice regarding mistakes, so constant protection from making mistakes may stifle the future development of an individual. Finding balance through the example of others will develop individual understanding so that learning is acquired and developed as a skill according to a study conducted by Betts (2003), and individual motivation naturally follows. Students in regular education have been provided the opportunity in development to learn from the examples of others, where students with special needs may not have been exposed to examples from others in order to develop the necessary skills.

Using the power of example as a premise, Bandura's (1977) theory discusses the use of symbols as tools for communication, as "humans don't just respond to stimuli, they interpret them" (p. 59). By storing events internally as visual images and verbal codes, the learner often acts out a fantasy in the mind to reinforce the observation, remembering the event for future external use. A connection to the internal and external discussion is found in research conducted

by Cheyne (1999) and Kim, Conger, Elder, and Lorenz (2003), examining learning and motivation. Both studies offer suggestions for better comprehension through internal and external speech and thought process training.

In the first half of the search for identity, the early adolescence phase of development, research by Cheyne (1999) indicates an external desire to belong to a group exists. A shift occurs in the second half of the identity search, the middle adolescence phase of development, where an external desire for the need to belong to a group changes to an internal desire of feeling alone. When the internal desire of feeling alone is properly interpreted as the need to become individual, development continues naturally into the next stage (Erikson, 1950; Freud, 1933/1980). If confusion ensues, impulsive decisions may manifest and a developmental crisis may result in blocking learning and motivation skills from forming (Betts, 2003; Cheyne, 1999; Kim, Conger, Elder, & Lorenz, 2003). The shift between early and late adolescence that should occur is delayed, indicating that there is a need for special services to assist with the shift between early and late adolescence. The changing of external desires to internal desires reflecting the normal process of development that is necessary for growth and transition into the next stage, the autonomy of adulthood, does not occur (Santrock, 1999; Sheehy, 1977), and the adolescent is stuck in an identity crisis. The crisis blocks the ability for normal development of learning and motivation.

Kegan (1983) shares the viewpoint regarding the crisis of the stage, “All developmental transitions are about a new form of ‘ego autonomy’; all problematic or arrested transitions threaten that autonomy” (p. 155). Threats to the autonomy of adulthood, specifically manifested as delays in learning and motivational development, come in many forms, and as studies

indicate, adolescent depression, negativity towards learning, and environmental factors are interrelated. Environmental threats are seen throughout the early, middle, and late phases of adolescence, “when kids are heavily occupied with their peers” (Levine, 1995, p.1), where environmental distractions from the 21st century technological advances of cell phones, text messaging, or instant messaging never cease. Fenden (2006) discovered that technology, specifically the cell phone, I Pod, and the Black Berry can impose and threaten the balance of individual growth in learning and motivation if control is lacking from parental guidance for appropriate use.

As a result of the study by Kaplan, D., Kaplan, H., and Liu (2001) it was discovered that the cohesiveness of the family structure directly affects the adolescent developmental period related to learning and motivation. Families with close ties rely on each other, share problems and successes, thus leading to positive social and emotional adjustment. Inversely, families that lack togetherness tend to develop problems with children leading to depression and negative thought processing that affect learning and motivation. When an environment in which the child lives is discovered to be unhealthy, physically or emotionally, a crisis exists in the developmental stage. The learning and motivation of the students is thwarted by the negative environment (Kegan, 1983) leaving the child at risk for emotional or developmental adversity. While crises occur naturally as integral parts of the developmental periods, there is an urgent need for families to support children so that successful learning and motivation naturally evolves as a priority, dispelling risky behavior that may lead to unhealthy patterns of learning (Hollin, 2003).

Anxiety and impulsivity were studied in a group of at risk adolescents between the ages of 12-18, indicating that at risk behavior “may lead to harmful practices” (Askenazy, 2002),

often referred to as laziness, a lack of motivation, or non compliance. A survey revealed that behavior outside the norm is considered a conduct disorder if children cannot function in a day to day setting at school or within the family structure (Lavoie, 2005). Lack of motivation not only places the child at risk for learning deficiencies, but also those in the immediate surroundings of the troubled youth, indicating a need to monitor family activity. Further study (Bacchini & Magliulo, 2003; Bednar & Fisher, 2003) indicates family issues as one of the several influential factors to unacceptable learning patterns and lack of motivation towards learning. As the learning patterns of at risk adolescents were monitored through observations and self assessment questionnaires, a serendipitous development emerged.

The findings reveal that childhood self perceptions are multidimensional, as was studied by Freud (1933/1980) with his id, ego, and superego theory regarding personality. The adolescent's perception of actual self resulted in a distance between the observed behavior of the adolescents in the study by Bednar and Fisher (2003). Adolescent perception of self did not match what the observational studies revealed. Freud's (1933/1980) developmental theory states that the id, ego, and superego are all parts of human multidimensional personality interacting together, sometimes in conflict with each other. Bednar and Fisher (2003) in studying anxiety and impulsivity of at risk adolescents confirmed Freud's beliefs of the multidimensionality of personalities, and of the conflicts. Adolescent self perception is in conflict with observed perception which blocks motivation and learning skills from developing naturally.

Bacchini and Magliulo (2003) not only found results in the adolescent at risk study that point to negative behavior, impulsivity, and lack of motivation and learning skills, but also found a correlation to classical theorists regarding adolescent self perception. Studies from Erikson

(1950), Maslow (1968), and Gardner (1993) validate the work done by Bacchini and Magliulo (2003) revealing that youth generally have positive feelings of actual self, evolving through the phases of development. As higher order thinking skills develop throughout the three phases of adolescence (Bandura 1977; Piaget 1965, found in Papert, 1999), the early adolescent experiences of frequent negativity and impulsivity change to a more positive thought based integrated self concept, substantiated in a study by Snowden (2003). Eventually accepting the role imposed by societal and cultural pressure, adolescents mature as Kegan (1983) relates, “Now the culture (family, school, friends) begins to make it known that it expects the adolescent to be able to take other people’s feeling into account even when the adolescent is considering himself or herself . . .” (p. 168).

If adolescents, male or female, struggle with the balancing act of self and others, continuing to make impulsive decisions that are out of control and that continue to block positive growth in learning and motivational skills, perhaps the higher order thinking skills that Bandura (1977) and Piaget (1965, found in Papert, 1999) discuss have not properly developed. Cheyne’s (1999) research indicates that a broader scope of the Zone of Proximal Development (ZPD) first developed by Lev Vygotsky (1962) be considered. ZPD touts that social interaction plays a fundamental role in the development of cognition that backs up Cheyne’s study. Characteristics of speech and thought are examined in the study, relating individual socialization of males and females with cultural and historical change to better perceive learner capabilities. “Young people place particular importance on the ability to rely on themselves, which is a decisive factor in the creation of their own personality” (Bacchini & Magliulo, 2003, p.5).

Cheyne's (1999) study links the differences in cultural experience, family background, and history to cognitive capabilities and development in both male and female teenagers using ZPD as a basis for the study. Cheyne discovered with research that once the potential to learn is understood by the adolescents, proper guidance to reach full cognitive potential blocks previous patterns of negativity and impulsivity. Knowledge is powerful, and adoption of positive peer influence blocks negative patterns from forming. Positive thought processes take over in the search for autonomy, indicating that higher order thinking skills are developing (Bandura, 1977; Piaget, 1965, found in Papert, 1999). "Humans don't just respond to stimuli, they interpret them" (Bandura, 1977, p. 59), as seen through positive peer influence that encourages healthy development of learning and motivation.

The requirements for a healthy development of learning and motivation have a direct relationship to the physical and environmental factors that surround human beings, but there are additional factors to consider that play an integral part in intellectual development. Basic stages of human development related to peers and parents impact psychosocial development, directly linking the growth of cognitive ability to maturation and healthy development of learning skills.

Parental, Peer, and Psychosocial Developmental Influences

Developmental delays and interruptions to intellectual growth can be better understood with a basic understanding of human development. The intersection between childhood and adulthood is identified as a gap called the *psychological moratorium* by Santrock (1999) and Dembo (1994) which concerns intellectual development between the security of childhood and the autonomy of adulthood. Individuals must close that gap for themselves, which is not always

an easy process. The ability to learn depends upon understanding, management, and balance without the fear or need for parental protection and intervention.

Whether male or female, peer pressure at this life stage is stronger than at any other stage of development. Stuck in the gap of the security of childhood and the autonomy of adulthood “adolescents flounder to find their way, then spread their wings and ready themselves to fly without the need for parental support” (Santrock, 1999, p. 372). The identity the adolescent so earnestly searches for does not end or begin in this life stage, but comes to a maturation point if the skills for learning and motivation through abstract thought processing have been acquired. Maturity allows the adolescent to sift through childhood peer pressure, deciding right from wrong when tempted to make impulsive decisions. “The strengthening of his social personality is one of the essential conditions for man’s existence. Were it not so, humanity would cease to be” (Jung, 1961, found in Boeree, 1997, p. 197).

Human development entails passing through trials and errors, crises as described by theorists Erikson (1950) and Freud (1933/1980), before individual identity is reached. Stage by stage the identity search for individuality progresses from childhood until adult identity is reached with independent thought processes, if a crisis does not completely block progress through the stages. A crisis occurs naturally (Erikson, 1950; Freud, 1933/1980) and may be misinterpreted by the adolescent leading to confusion or negative impulsivity. Chronological age and physical development continues to progress even if a crisis ensues, adding to confusion for the adolescent which may block the process for development of learning and motivation.

If a crisis in the stage is not resolved, childhood identity continues to emerge in the physical body of an adolescent with a chronological age seemingly prepared for adulthood.

Confusion gives rise to immature impulsive behavior because the learning process has not properly developed. The confusion may be seen as the result of a crisis not properly managed, blocking realistic goals from forming with a need for support from the special education department. A recent study conducted by Bradley (2005) examined the eligibility determination for learning disabilities as a result of the Individuals with Disabilities Education Act (IDEA), and discovered that enormous discrepancies exist, “leaving each state to decide on its own how it would determine the discrepancy between ability and achievement” (p. 485). As a result, an idea for a new focus before the immediate identification into the special education program (Marston, 2005; Reschly, 2005) was introduced as the response to intervention (RTI) program.

The RTI program recognizes that adolescents need to be taught that crises are a natural evolution in the human development process, nothing to be feared ((Marston, 2005; Lavoie, 2005). If the fear is reduced with knowledge and understanding, the teenage *acting out* (another term for teenage impulsivity, or lack of motivation, or *laziness*, or *just does not care* attitude) can be reduced or stopped completely, as discovered by studies done on anxiety, behavior management, and self-esteem in adolescents (Marston, 2005; Snowden, 2003). “Failure to address the behavioral issues along with the academic skills deficiencies diminishes the impact of the academic interventions” (Reschly, 2005, p. 512). As a result of the RTI program, an evaluation and identification for enrollment into the special education program is not necessary.

In the earliest stage of adolescent development a teenager strives to be like everyone else, working through to the middle stage where a series of crises are most often peer influenced.

Premature identification into the special education program may be avoided if adolescents and caretakers remember that crises are necessary if growth is to transpire (Erikson, 1950; Freud,

1933/1980; Sheehy, 1977). The often misunderstood age group of adolescence tends to place more value on peer influence than any other age group in human development, ignoring parental influence at any cost or sacrifice due to “a relentless campaign to seem ‘cool’ . . . and to market themselves to peers” (Levine, 1995). If peer influence and parental influence are constantly at war with each other, then teens will most likely choose peer influence (Bednar & Fisher, 2003), “as parental influence is associated with chores and rules, and peer influence is associated with fun” (p.2).

In late adolescence peer pressure no longer controls and influences every move and decision, provided that abstract thought processes have developed and matured for healthy cognitive patterns to occur. Older teenagers strive for individuality without the need to please anyone else but self, as Levine’s (1995) research reveals, “Maturing nervous systems are working overtime to define individuality” (p. 5). Teenagers are operating within a crisis mode where impulsive decisions may surface at any time to keep up with peers. If impulsivity leads one into harms way, then control is lacking which may be due to an immature development of the learning process, and not the need for special education services.

Parents without control are low in monitoring or overly negative and push teens to either externalize impulsive behaviors or to associate with deviant peers (Kim, Conger, Elder, & Lorenz, 2003). Bednar & Fisher (2003) also found that encouraging autonomy too soon, at too early of an age, can lead to impulsive decision making when maturity is not in place to cognitively handle the results (Piaget, 1965), often ending negatively. If cognitively prepared, decision making by adolescents is influenced more by whoever is considered to be more competent in terms of the subject. For example, parental influence is valued for long-term value

based, ethical decisions, where short term social decisions are influenced more from peers (Dembo, 1994; Santrock, 1999).

Adult influence outside the family fits into the same category as parental influence, under the same scrutiny of competence for subject matter (Cheyne, 1999). If a particular adult is perceived by the adolescent to be the most informed on a subject matter, then the adolescent will choose the adult for information and advice. Teachers are generally not considered as important to adolescents due to overcrowding in classrooms according to studies by Betts (2003) and Snowden (2003). The common teacher assignments in middle and high school are in excess of five periods a day with 20-30 students per period (Snowden, 2003), leaving little or no time for personal relationships with students.

The nature of the adolescent period of human development is to test self reliance after receiving guidance and direction from adults. If learning skills are in tact, then the decisions to test self reliance are well informed through positive motivation from adult leadership. If a teenager with weak learning and motivational skills has minimal parental supervision and most secondary teachers have 150 students to reach and teach every day, then where do adolescents without strong learning skills turn for advice and guidance? The scenario is too common, and often results in adolescent impulsivity leading to dangerous consequences because there is not enough adult support for youth to consider as competent role models (Kilpatrick, 1992). For the lucky ones, trust is established and development through the adolescent period progresses naturally, leading to autonomy. For the unlucky ones, left with no one to establish a trusting relationship, teenage delinquency, gangs, and drug abuse become alternatives because guidance and direction are not readily available through parents, teachers, or other adults (Fenden, 2006).

Children feel the need to test self reliance to get through a crisis which means that human development is progressing naturally. Learning to work through crises requires an independent time period away from embedded parental protection to break through the strong parental bonds in seeking autonomy, the ultimate goal. Without the ability to develop strong learning skills due to a delay in abstract thought processing, motivation from peer pressure creates additional conflicts tempting poorly formed decisions to be made. Conflicts often occur with the very persons with whom trust has been ultimately established in the trust vs. mistrust stage of development (Erikson, 1950), providing that trust has been established and the developmental stage of trust verses mistrust has been achieved and surpassed. During the period of adolescence authority figures are often confused as the enemy (Dembo, 1994; Santrock, 1999). “Autonomy, though feared, is valued above all; anyone interfering with it is the enemy” (Ginott, 1969, p. 20).

Parents who teach decision making skills expect that children will test the skills within peer related activities. Without the basic skills taught by parents, a disadvantage exists stemming from a lack of learning and motivation to do the right thing. The peer related activities will continue to test children, but without the learned skills, how will the right decisions be made? Parental influence does not wane during this period of development, but the additional influence of peers becomes another variable for the child to consider. Simply by observation (Hollin, 2003), knowledge is acquired, “The capacity to learn by observation enables people to acquire large, integrated patterns of behavior without having to form them gradually by tedious trial and error” (Bandura, 1977, p. 12). A question for parents, teachers, and caretakers to consider is whether the quality of peer influence is high enough to teach positive and not negative behavior patterns. The study by Bednar and Fisher (2003) reflects upon how strongly peers influence the

decisions made by others through an examination of parental style. A look into parenting styles provides an additional link into the development of learning and motivational skills.

Parental styles fit into four categories, according to a study conducted by Bednar and Fisher (2003). Parents are the earliest connection a human being has to reaching adulthood (Erikson, 1950; Freud, 1933/1980), playing a significant role in development, so serious consideration is given to how parents' parent. Four parenting styles, each with a two dimensional aspect of demandingness (claims made by parents for supervision, disciplinary efforts, and a willingness to confront a child who disobeys) and responsiveness (parents who intentionally foster individuality, self regulation, and self assertion), are identified: *authoritative*, *authoritarian*, *permissive*, and *neglecting/rejecting*. Basing the choice to survey older adolescents on the premise that the decision making process rarely changes from early adolescence to late adolescence, Bednar and Fisher (2003) chose the older group.

An *authoritative* style of parenting studied through survey results (Bednar & Fisher, 2003) is found to be the most conducive environment for teenagers to acquire the skills for abstract thought development towards independence and self regulation. A balance is achieved between demandingness and responsiveness of parent and adolescent relationships. Parents using an *authoritarian* style are demanding, without any balance of responsiveness. A *permissive* style of parenting reflects responsiveness, but lacks balance without making demands. A *neglecting/rejecting* style of parenting has neither demandingness nor responsiveness, leaving the adolescent with a sense of abandonment, with nothing on which to base decisions from a parental point of view (Bednar & Fisher, 2003). Many students identified with disabilities in learning and motivation lack parental guidance.

Regardless of parenting style, the teen most likely chooses peers for making short term day to day social decisions because peers are associated with social life, a necessary choice in development according to Piaget (1965). “It means that social life is necessary if the individual is to become conscious of the functioning of his own mind . . .” (p. 400). The choice is less clear for youth when moral or informational decisions are formed, dependant on parenting style. Moral and informational decisions are likely directed to authoritative parents over friends and peers because the necessary trust has been established (Erikson, 1950; Freud, 1933/1980). Responsiveness, a dimension of parenting that encourages individuality and self regulation (Bednar & Fisher, 2003), significantly influences the amount of decision making assistance the adolescent seeks. Lack responsiveness may be a significant factor into whether a student is identified with an area of disability that requires services from the school special education department.

Armed with parental guidance while searching for identity formation, teens seek to establish a sense of self separate from family. Testing decision making skills without adult supervision to monitor and control impulsivity is an important step in the development process (Bednar & Fisher, 2003; Maslow, 1968). “Emotional disengagement from the family and a transfer of attachment to peers” (Piaget, 1965, p. 401) takes place, leading from a state of disorganization to a higher level of organization with age, ending when feelings of self image and self esteem are achieved for themselves and others in the social context.

The purpose of adolescence is to loosen personality. His personality is undergoing the required changes: From organization (childhood) through disorganization (adolescence) to reorganization (adulthood). Adolescence is a period of curative madness, in which every teenager has to free himself from childhood ties with parents, establish new identifications with peers, and find his own identities. (Ginott, 1969, p. 25)

The issue of self image and self-esteem play a pivotal role into the process of adolescent maturity and abstract thought processing that leads to skills for learning and motivation. Cross sectional research (Bacchini & Magliulo, 2003) was conducted regarding self image and self efficacy as separate concepts within the perception of self, confirming the multifaceted aspects of learning and self-esteem (Erikson, 1950; Freud, 1933/1980). Adolescents may often times present themselves in a variety of situations with powers, abilities, inclinations, and personal attributes of ideal self significantly different from actual self as perceived from peers, parents, and figures of authority. “The quality of the description of self, of one’s relationship with others and one’s own abilities, constitutes a valid indicator of the individual’s level of adaption to the developmental tasks that characterize adolescence” (Bacchini & Magliulo, 2003, p. 2). If the level of adaption to adolescent challenges is not perceived by observations to be the same as the verbal presentation from the adolescent, then the adolescent is not yet cognitively prepared with higher order thinking skills necessary for autonomy. Impulsive decisions erupt without the necessary skills of learning and motivation to meet the challenges.

For example, teenagers sometimes tend to believe in the invincibility of the Superman complex: nothing can harm me (Calvert, Conger, & Murray, 2004). If higher order thinking skills are underdeveloped then Superman, the comic book character, a mild mannered man of steel, becomes a hero figure for youth who want to emulate the Superman persona: nothing can harm me. When teenage impulsivity emerges without forethought due to weak skills of learning and motivation, and the fictional steel barrier that protects Superman is falsely perceived, many young people can be lead into a path of danger. The need for heroes is so strong that the threat

of danger or risk to health and well being does not steer away from the temptation of impulsive decision making until higher order thinking skills develop (Kilpatrick, 1992).

A study (Gerrand, et al., 2000) concerning the health risk behaviors of adolescents, self-esteem, and self serving cognitions reveals an interesting concept regarding the justification of risky behavior, called the *false consensus effect*: “the tendency for people who engage in a given behavior to believe that the behavior is more common than do people who do not engage in the behavior; a specific type of self justification, ‘Everybody’s doing it’” (p. 1178). Risk taking occurs “when an individual’s self esteem has been threatened by a failure experience” (Gerrand, et al., 2000, p. 1180). The adolescent is overwhelmed with concerns of peer relations, employment, sex, school work, and the future, and without the developmental skills of learning and motivation to cognitively work through the crises, failure may ensue. With so many areas for failures, seeking individual identity can be especially stressful sometimes leading to risky impulsive behavior in need of peer approval.

Approval seeking behavior is part of the environment in which humans evolve (Dobson, 1982; Erikson, 1950; Maslow, 1968) and that kind of behavior fosters risk taking. An ethnographic study by Fessler (2001) was conducted to determine the degree that emotions play in the scheme of risk taking behavior. Emotions are never wrong, but what is done with the emotions can influence the outcome of an event, ultimately affecting self-esteem. The study by Fessler (2001) found that with strong self-esteem and strong skills of learning and motivation the emotions of shame and pride are less frequently influential in the decision making process.

Without a strong self-esteem due to weak learning skills, more impulsivity may occur in the decision making process in order to impress peers, but how to track impulsivity can be difficult.

Measuring impulsivity alone is difficult, so a study (Wood, 1997) was conducted in correlation with the future time perspective of adolescents. The more impulsivity reported the more constricted the perception of the extension of future time. The results determine that the impulsivity level of individuals directly relates to extension of future time perspective, unable to be comprehended without strong skills of learning and motivation. Considering A, B, and C as examples, if an impulsive adolescent commits an act A without prior consideration of all of the results, the adolescent with the shorter extension of future time realizes that B occurs, but never considers that C might happen (Woods, 1997).

Individuals who do not recognize that serious and harmful consequences for impulsive actions occur react without a well thought out plan. Without well developed higher order thinking skills of comprehension, the decision making process is in the immature stages of development (Bandura, 1977; Gardner, 1993; Piaget, 1965). Adolescents with or without learning disabilities make impulsive choices if higher order thinking is not fully developed, leaving an adolescent with a feeling of extreme embarrassment for poor decisions.

Extreme feeling of being different can create self-esteem issues with all adolescents, especially if diagnosed with a learning disability (Lavoie, 2005). Erikson's (1950) second stage of human development: autonomy vs. shame and doubt is threatened when students who struggle academically or emotionally express self doubt. Until the negative crisis is successfully balanced with the positive goal of independence, establishing autonomy, the adolescent is in a developmental stall. "Every learning disability has a social component. A successful social life is immeasurably important to a child's happiness, health, and development" (Lavoie, 2005, book jacket). Maturity throughout the three phases of adolescence: early, middle, and late, requires

confidence, and as higher order abstract thoughts develop and emerge, a more integrated theory of self results, as stronger skills of learning and motivation develop.

In search of finding individual identity, “having a positive self-image can affirm children’s self-worth, a much needed concept in growing up” (Santrock, 1999, pg. 314). The degree of challenge is not always in balance with the degree of support in the search for independence and autonomy, allowing a *negative attitude* to surface (Kelley & Stack, 2000). Without a healthy balance of challenge and support from parents, teachers, and caretakers, from where will schema build to create the necessary skills of learning and motivation for the self confidence to find autonomy? Perhaps teenagers who allow impulsive reactions to control decision making are not challenged enough by their caretakers, stalling the developmental process of learning with negativity, resulting from poor decisions. The *negative attitude* surfaces because teenage self-esteem must be protected at all costs (Levine, 1995), so if an attitude disguises the real problem of immaturity or lack of cognitive ability, then the teenager feels exonerated. Unfortunately, “Avoidance of a problem lowers self-esteem due to denial or deception” (Santrock, 1999, pg. 315).

The developmental process is stalled if problems that have been created by impulsive reactions are avoided, as individual challenges are *fixed* by too much support (Dobson, 1982). Many times when asked why a particular behavior is exhibited, the adolescent response reverberates with confusion, with no clear explanation because the ability to work things out has been taken away by an adult. Part of the balance between challenge and support must include respect for the adolescent’s opportunity to learn. Adults need to remember that adolescents respond faster to action than words (Gardner, 1993). An adolescent will push limits to the point

where an action will occur, whether learning skills are weak or strong. It is the responsibility of the adult to remain calm, take control of the situation, and to respond with the appropriate action. Enforcement should never be by punishment, sarcasm, or ridicule, so as to protect the child's self image (Dobson, 1982; Fessler, 2001).

Adults need to let children make mistakes. A necessary step for growth according to Erikson (1950), Freud (1933/1980), and Maslow (1968), is the experience of the painful transitions of the crisis/conflict, challenge/support, and need/fulfillment stages. Learning comes from mistakes, so constant protection from mistakes may stifle the future development of an individual, causing a need for support services within schools from special educators. Finding balance between the stages will develop individual understanding so that the knowledge of when to allow or delay impulses is learned and developed as a skill (Gardner, 1993; Kelley & Stack, 2000). Impulsive decisions may come with consequences, but Dobson (1982) makes an interesting point by stating that the adolescent is more likely to make the right decisions if adults don't interfere, provided that the guidance and groundwork have been previously established. If the super-ego is well established, and the learning process is not delayed, then the adolescent can regulate and reward oneself while maintaining a healthy self-esteem (Freud, 1933/1980).

In support of the theory on letting teens make mistakes, Dobson (1982) conducted a study of a senior high school class that was looked at ten years later. Almost all of the students had drug or alcohol problems in which some led to conflicts with the law. Of the adults interviewed, each one said that they wished parents hadn't bailed them out of the problem. The adolescents were not able to learn from mistakes, a necessary step in the search for individual identity. A

little problem that could have been solved, led to more serious consequences because self confidence was never allowed to develop, and skills to learn from mistakes were thwarted.

To assist in building adolescent self confidence, a study was conducted by Kaplan, D., Kaplan, H., and Liu (2001) and found that adolescent children tend to follow or adopt their parents' expectations, as if by osmosis. Parents with high self-esteem project high expectations and parents naturally influence their children. Additional research (Kelley & Stack, 2000) indicates that not only at risk adolescents falter in the search for self confidence, but sometime in life, all human beings are tempted and may cave into negative pressure from outside sources, or from within their own personal individual thought processes.

Three distinct areas to consider from the Kelley and Stack (2000) study: (1) recognition of the intrinsic value of humanity born good and wholesome with the capacity to attain psychological health, (2) that two processes of thinking exist: process thinking (acquired ability) and free flowing thinking (innate source of profound human intelligence), and (3) stress and distress are functions of the abuse of process thinking, causing the innate thought processes to drift into an unhealthy pattern.

Process thinking cannot be acquired if there are intellectual blocks to the accumulation of skills for learning and motivation. Parents, peers, and psychosocial developmental factors contribute to a healthy or unhealthy development of learning and motivational skills, as seen through the empirical evidence of recent studies and classical theories of intellectual development. Other factors to consider that affect intelligence, learning, and motivation are found in recent studies, not yet conclusive, that involve the activities of the brain.

Neurotransmitter Affects on Intelligence and Cognition

Unhealthy thinking patterns affect the ability to learn and block the development of abstract cognition. Without higher level thinking skills to process decisions that lead into the healthy development of adulthood, the autonomy of adulthood may be delayed. The early, middle, and late stages of adolescence are the breeding grounds for abstract cognitive development leading to the autonomy of adulthood. If thinking patterns are adrift in a negative direction, then learning is unreachable due to a lack of developmental skills. Learning, the apex of life according to the early Greeks, Plato, and Aristotle, also includes social development, “in the tradition that can be traced to Plato and Aristotle, humans are naturally social animals with a moral obligation to attend to justice and fairness” (Masters & Gruter, 1992, found in Masters & McGuire, 1994, p. 5). If learning, abstract cognition, and social development are interrelated, then the healthy development of all three is necessary to attend to the justice and fairness for all human beings regardless of differences in intelligence, learning, and motivation.

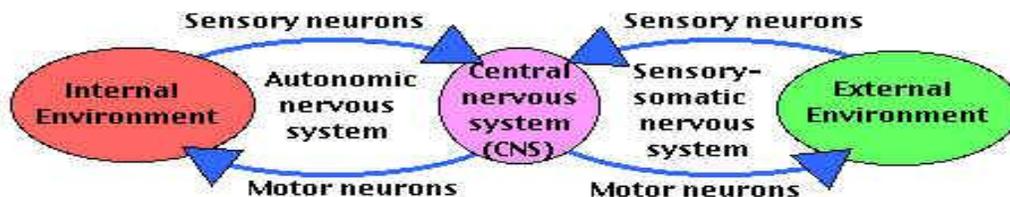
A lack of higher level thinking skills can delay the development of intelligence and cognition which provides the avenue for justice and fairness needed for autonomy. Intelligence had been studied and measured by experts who point in several directions, recommending varied ways to view it. “An intelligence test should not be used as a sole indicator of mental retardation or giftedness” (Santrock, 1999, p. 286). Recognizing individuality before using standardized tests results in measuring human competence should become a priority. Compassion cannot be scored on a test, yet we need to use compassion in our dealings with others, as human development demands justice and fairness (Masters & McGuire, 1994).

Gardner (1993) defines intelligence as “the capacity to solve problems or to fashion products that are valued in one or more cultural setting--a definition that says nothing about either the sources of these abilities or the proper means of ‘testing’ them” (Introduction: 10th anniversary ed, p. x). Gardner’s intelligence theory, Multiple Intelligences, takes into consideration the effects from genetics and environment influenced by culture, a concept shared by Bandura (1977) and Piaget (1965), creating differences in intellectual profiles. The Binet IQ test once considered the norm for intelligence tests is again questioned (Bradley, 2005; Marston, 2005), as it was questioned by Piaget (1965).

Regarding the IQ test scores, Gardner writes, “does predict one’s ability to handle school subjects, though it foretells little of success in later life” (Gardner, 1993, p. 3). The opportunity for success is not lost for adolescents who score low on the IQ test due to struggles with educational, emotional, financial, cultural, or familial difficulties. Exposure to solving the practical problems of the every day world offers another venue for success and happiness leading to the social development of comprehension and the decision making process, often outside of the school environment (Bandura, 1977; Gardner, 1993; Piaget, 1965). Studies conducted by Bradley (2005), Marston (2005), and Reschly (2005) in determining the criteria for identifying learning disabilities parallel the discussions of IQ test results. “I/Q/achievement discrepancy is neither necessary nor sufficient for individuals with a specific learning disability,” (Bradley, 2005, p. 485).

If a lack of abstract thinking skills blocks the social development of comprehension and the decision making process, inside or outside of the school environment, then the capacity to solve problems is interrupted, leading to a crisis (Erikson, 1950; Freud, 1933/1980; Maslow,

1968). The crisis involves intelligence, according to Gardner's (1993) definition of intelligence, "the capacity to solve problems . . ." (Introduction: 10th anniversary ed., p. x), and the *Merriam-Webster's Collegiate Dictionary Eleventh Edition* (2003) definition, "the ability to learn or understand or to deal with new or trying situations: reason" (p. 650). As adolescents encounter new or trying situations from the environment, the central nervous system attempts to process the crisis. An explanation of the functions of the central nervous system aids in understanding the relationship between learning and the development of abstract cognition. Each plays a part in solving the developmental crisis so that learning, abstract cognition, and social development are no longer blocked, allowing problem solving skills to develop.



The perception of the central nervous system consisting of the brain and the spinal cord, functioning as a three component operation compares to two classical three point explanations in human development (MacLean, 1983, found in Masters & McGuire, 1994) . The id, superego, and ego of human personality theorized by Freud (1933/1980) is one, but long before Freud a philosophy by Plato professed that human nature has three parts of the soul. Both provide a *triune* view of human nature (Masters & McGuire, 1994, p. 6) similarly described in

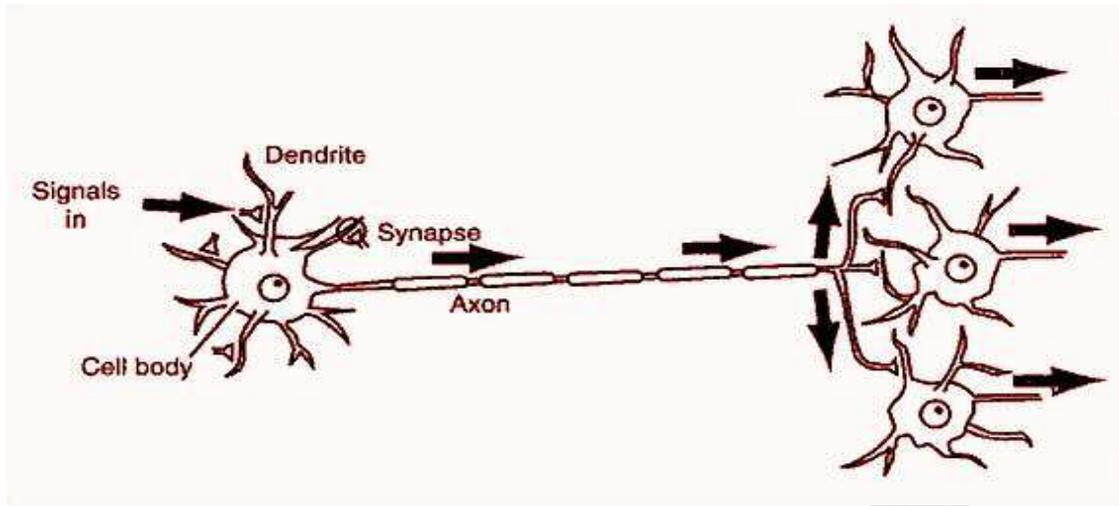
contemporary brain research. The midbrain and brain stem control elementary movements, the cortex--*gray matter, the locus of complex thought*, specializes in complex information processing, and the limbic system consisting of structures between the midbrain and the cortex functions as the seat of emotions. Developments in the central nervous system coupled with specific brain research suggest that the three major structural components of the brain provide an explanation for how human beings “view the world, process that information, and act on it” (MacLean, 1983, found in Masters & McGuire, 1994, p. 6).

The functions of the brain are complicated and difficult for the layman to comprehend, but necessary in order to understand where abstract thought processing is found to be most prevalent in human development. The history of the development of neuroscience lays the groundwork for a better understanding of brain functions, but by no means claims to be the only explanation. “There is no one way to make a significant contribution in science” (Valenstein, 2005, p. 185), as one explanation leads to another and another while social scientists continue to gather and test data. The explosion of discoveries linking the biological functions of the brain to how the effects of the discoveries are influencing human development changes more rapidly than can be comprehended. “Our very existence today testifies to the fact that the evolving brain has mastered the task of changing or adapting rules to accommodate the demands of the ever changing environment . . .” (Masters & McGuire, 1994).

Structural brain research is pale in comparison to how neurobiology views the functions of the brain. Abstract thought processing is studied in more detail through the biological study of behavior: *ethology*, “neuroscience is discovering how the brain works—and chemistry is becoming one of the keys to these discoveries” (Masters & McGuire, 1994, Preface, p. xiii). As

social scientists strive for a deeper understanding of the ever changing environment, risks must be taken to develop schema on which to attach new phenomenon. “Speculation and theorizing in science involve potential risks as well as gains” (Valenstein, 2005, p. 184). Keeping up with the most current status of brain research creates challenges, so referencing basic scientific theories where schema exist aids in the understanding of the newest phenomena of neurobiology.

Starting with an understanding of the theory of the basic unit of life, the cell, “By the 1850’s most biologists had accepted the theory that the cell was the basic unit of living tissue. The nerve cell and its fiber constitute the basic unit of the nervous system,” (Valenstein, 2005, p. 2) as proposed in the neuron doctrine in 1891. Neurons are nerve cells that transmit chemical and electrical impulses that allow the brain to process information. The signal, processed information from the brain, travels from sensitive fibers called dendrites, to the cell body and along the axon. The action inside the cell is electrical, *sparks*, and the action between the cells is chemical, *soup*, called neurotransmitters (Valenstein, 2005). The axon is the sender of the information, while the dendrites and the cell body are the receivers of the information. The chemical and electrical impulses are transmitted to the dendrite of the next neuron across a tiny gap.

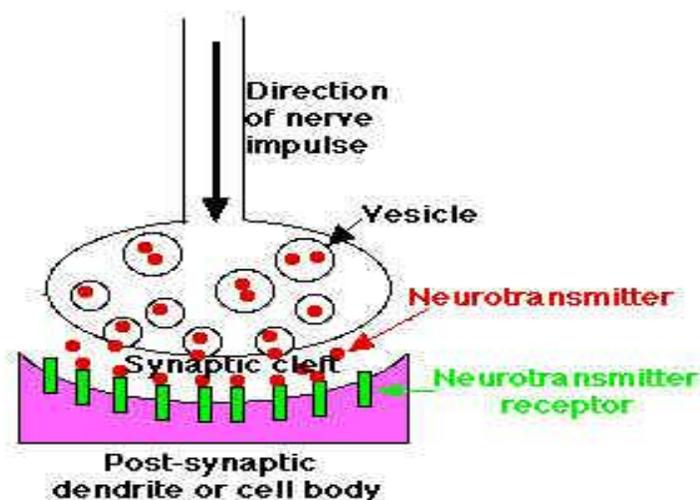


Not until the 1950's was a powerful enough microscope developed to actually see that a gap existed between the neurons. The gap came to be known and accepted as a synapse. To further explain the synapse, a delay in transmission between neurons was discovered and needed a name to continue the study of nerve impulses. The focus on the synapse led to the controversy of “whether nerve impulses are transmitted across the synapse electrically or chemically” (Valenstein, 2005, p.5). Despite early studies revealing that chemical neurotransmitters could possibly cause nerve impulses, a heated debate between physiologists and pharmacologists called the *War of the Soups and the Sparks* extended over two decades (Valenstein, 2005, p. 129).

Studies conducted as early as 1914 using adrenaline, a natural substance of the body, led directly to “the existence of chemical neurotransmitters” (Valenstein, 2005, p. 22), but the two sides continued to argue, claiming that electrical transmission was the only possible explanation for nerve synapses because a chemical transmission was too slow. “Later it was learned that chemical transmission of the nerve impulses takes only a few milliseconds, fast enough for any task known” (p. 185). Controversy at the turn of the 20th century blocked progress in the discovery and function of neurotransmitters, until now. At the turn of the 21st century the study

of neurotransmitters has again reached the laboratories of scientists, studying the results of the action between the cells as possible explanations for the development of abstract thought processing. The studies are in the experimental stages and the results inconclusive, so the need to carefully monitor the results remains a primary concern in the school communities where the overuse of medication to control neurotransmission in children may surface.

The *War of the Soups and the Sparks* was interpreted by the 2001 Nobel Prize in Physiology or Medicine winner, Arvid Carlsson, with clarification that the first chemical discoveries were “foreshadowing the paradigm shift from electrical to chemical signaling between nerve cells in the brain” (Valenstein, 2005, p. 163). As modern techniques advanced the necessary proof to accept that the transmission of nerve impulses as chemical over the synapse became overwhelming. Chemical transmission became universally accepted; electrical transmission became the exception.



Valenstein (2005) shared a view of differences in personalities as a possible reason for the *War of the Soups and Sparks* that played a significant role in the development of neuroscience, “how differences in personalities influenced the way this history evolved” (p. 182). Interestingly, the evolution of neurotransmitters directly affected by the human behavior of personality differences is understood to play a significant role in the use of drugs such as Ritalin, Prozac, and others (Valenstein, 2005, book jacket), which directly affect human thinking and behavior. How does contemporary research on neurotransmitters relate to our understanding of thinking and human behavior? “Discoveries concerning the effects of neurotransmitters on human behavior obligate us to reexamine established ways of thought” (Masters & McGuire, 1994, p. 3), taking risks that challenge previous schools of thought regarding intelligence, learning, and motivation. Keeping in mind that the careful examination of the risk factors in social scientific research remains a primary concern in the identification of a specific learning disability, parents, educators, and caretakers must not jump to conclusions regarding learning.

In 1960 serotonin, “another interesting chemical substance found in the brain,” was “not accepted as neurotransmitters,” (Valenstein, 2005, p. 160), but had a role in brain function. Along with the study of emotions that affect learning, impulsive behavior, and self-esteem (Fessler, 2001), suggestions infer that the role of the neurotransmission of serotonin is a key factor in learning and self-esteem. Further development of the study on neurotransmitters, specifically serotonin, indicate how abstract thought processing, learning, and decision making are affected by the relationship between serotonin and synapse function (Masters & McGuire, 1994; Valenstein, 2005). The effects continue to be studied, with pending results.

A psychological theory emerged in 1983 combining two studies, one which explored the cognitive development of healthy and gifted children, and the other which studied the breakdown of cognitive brain functions in adults (Gardner, 1993). Gardner argues, “Neurobiology research indicates that learning is an outcome of the modifications in the synaptic connections between cells. Various types of learning results in synaptic connections in different areas of the brain,” (Introduction, p. x). The interesting chemical substance found in the brain in 1960 called serotonin has since found a relationship with neurotransmission, synapse connection, learning, motivation, self-esteem, and abstract thought processing.

Inactivity in the brain was studied (Askenazy, 2000) and associated with attention, concentration, planning, and organization directly relating to the development of abstract thought processing. Neurotransmitters that lack the ability to send complete chemical messages across synapses indicate less activity in the brain. “Mean platelet serotonin concentration was positively correlated with the intensity of impulsivity” (Askenazy, 2000, p. 26). “Neurotransmitters like serotonin vary from one individual to another for many reasons, including the individual’s life experiences, social status, and diet. Genes may influence neurochemistry . . . so does behavior, culture, and the social environment” (Masters & McGuire, 1994, Preface, p. xiv). Serotonin studies continue to develop new theories that relate to intelligence, learning, and motivation.

Contemporary neuroscientists discover how we perceive, feel, and think, and recent discoveries attest to human abilities to control outcomes with varying results. A study (Retz, Retz-Junginger, Rosler, Supprian, Thome, 2004) relating serotonin function and impulsivity reveals, “There is evidence that disturbances in central serotonin (5-HT) function have a role in

impulsive aggression” (p. 415). Another study (Kish, 2000) indicates that drug abuse from the dance drug ecstasy lowers “the brain’s supply of serotonin, a neurotransmitter linked to mood swings. Ecstasy is thought to produce euphoria by releasing a rush of serotonin, but the brain has trouble replenishing the supply” (Kish, 2000, p. 23). Human behavior, specifically impulsive decision making in adolescents, and the study of serotonin are not yet conclusive, but continue to provide information worthy of further study, “The specific discoveries concerning the connections between serotonin and such behaviors as suicide, seasonal depression, alcoholism, impulsive homicide and arson, and social dominance are thus important but not conclusive” (Masters & McGuire, 1994, Preface, p. xiv).

Conclusion

Comparisons to classical theorists present valuable insight into where in the process of learning and motivation skills appear to develop, as indicated by contemporary social scientific research. Psychosocial development, parental and peer influence, emotional development, motivation, learning, and self-esteem are interrelated in the decision making process of adolescence, specifically in relationship to intellectual development. Indications from research show that adolescents are cognitively unprepared when abstract thought processing is delayed. The lack of knowledge that a developmental crisis is part of the normal process of maturity to adulthood may lead to at risk and harmful behavior. There is a need to teach children, parents, and caretakers of the normal processes of development which may slow down the urgency for requests to identify children for services from special education.

Using brain research and informational processing examples of intelligence, cognition, and neurotransmitter research, serotonin is under considerable scrutiny as a possible connection

to the signals in the brain across synapses that affect abstract thought processing. Contemporary social scientists consider gender, ethnicity, intelligence, and self-esteem as influential factors in adolescence related to the development of higher level thinking skills. Necessary background from current research is provided to link serotonin levels to reasonable explanations for developmental progress or the lack thereof, indicating a need for further research. Inconclusive results from social scientific research should not be used to base the use of prescription drugs for children struggling to achieve the development of abstract thought processing skills. “There may be as many as one hundred different chemicals that act as neurotransmitters in the nervous system” (Masters & McGuire, 1994, p. 186), which may affect ideas for future studies for intelligence, learning, and motivation.

Despite the criticism, Bandura (1977) continued to recognize the need for more study when he states, “Our theories of psychology should adapt to the new realities. . . We have a vast new world of images brought into our sitting rooms electronically” (as cited in Pajares, 2004). The nature of education, recognized by Bandura (1977) as changing, is as true today as it was almost thirty years ago when he states,

Educational practices should be gauged not only by the skills and knowledge they impart for present use but also by what they do to children's beliefs about their capabilities, which affects how they approach the future. Students who develop a strong sense of self-efficacy are well equipped to educate themselves when they have to rely on their own initiative. (as cited in Pajares, 2004)

High school is the last stage of formal education before the experiences of the real world challenge many students. Not all students attend college. What students face in the real world, outside the sheltered walls of school life does not appear on an IQ test. Educators need to rise to

the challenge of preparing for the 21st century by bridging the gap between school, the community, and the real world outside of school by abandoning past practices for new innovative teaching. It takes courage to compare classical theories in the five major areas of human learning: “nature of intelligence, motivation of students, the way students learn, what students should learn, and how learning should be assessed” (Feden, 2006, p. 80). Classical theories by Piaget (1965), Vygotsky (1962, as cited in Cheyne, 1999), and Gardner (1993) outline human development traits of intelligence, learning, and motivation, but contemporary theorists need to continue research to adapt to the new millennium environment.

Adapting to the new realities, as Bandura (1977) suggests, empowers youth to educate themselves beyond what is offered in classrooms. Teachers, parents, and educators must teach that learning and motivation is within the normal realm of human development and that it can be managed with a deeper understanding of individual strengths. “It is only by knowing our individual nature with its limitations as well as its resources that we grow capable of coming out of ourselves and collaborating with other individual natures” (Piaget, 1965, p. 394).

If the human development process of learning and motivation took place in a perfect utopian society such as the one created by author Lois Lowry (1993) in *The Giver*, teenage angst would not exist, and the lack of abstract thought processing would not lead to irresponsible impulsive behavior leading to risk taking decisions that so often threaten adolescent autonomy. Well adjusted adolescents grow and prosper with trust, relying on responsible parenting and adult guidance to emit the right balance of support and challenge so that normal stages of crises in learning and motivation are met and overcome with success (Erikson, 1950; Freud, 1933/1980). Taking flight into the autonomy of adulthood does not emerge without problems in

need of societal support as social utopia does not exist in the real world. A necessary step in life for the development of intelligence, learning, and motivation that leads to autonomy is found through “A successful social life that is immeasurably important to a child’s happiness, health, and development” (Lavoie, 2005, book jacket).

Control and balance paves the way for acceptance of the responsibilities necessary for passage into adulthood through examples of alternate methods of learning and motivation. KAM 5 Application indicates that with proper guidance, as teenagers seek peer approval in search of individual identity, they are willing to learn to control impulsivity and risk taking behavior by following alternate styles of teaching and learning. The differences in learning and motivation for students from the regular population compared with students from the special education population will be presented in a summary preceding the development of a 2001 video presentation in KAM 5 Application.

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Knowledge Area Module 5

Theories of Intelligence,
Learning, and Motivation for Persons with Special Needs

Application Component

EDUC 8531: Educational Practices Grounded in Principles/Theories of

Learning, Diversity, and Inclusion

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Contents

Introduction	01
Background of Learning Style Differences	02
Stages of Video Development	04
Intervention and Strategy List	07
Conclusion	08
Application References	09
Appendix A: Project Proposal for Science Experiment	11
Appendix B: Videotape Transcripts, Explanations, and Instructions	13
Appendix C: Science Experiment: Project Skate--Mass Using Skateboards	16
Appendix D: Curriculum Alignment with State Standards	17
Appendix E: English As a Second Language (ESL) Curriculum Adaption	19
Appendix F: Cross Curriculum: Mathematics and Science	22
Appendix G: Textbook Alignment: State Standards & Multiple Intelligences Theory	23
Appendix H: Parent/Guardian Permission	25
Appendix References.....	26

Application Component

Introduction

The Application of KAM 5 will identify, synthesize, and analyze the intellectual capabilities of students with identified disabilities, considered different from regular student capabilities. The logical and linguistic learning styles that currently dominate teaching and learning environments create a learning void for students that use a style outside of the common didactical mode of teaching (Gardner, 1989; Senge, 2000). A 67 minute video demonstration (Swindler, 2001) models an alternate style of teaching and learning that is in proper balance with societal demands for 21st century self starters and independent thinkers. The development of the video from the initial stage of conception as a project proposal, through the adaptation stages as alternates to regular curriculum, to the end result of a video that can be used as a teaching tool will be the focus of the Application.

An eager group of fourteen high school students identified with various disabilities demonstrate in the video that through an alternate style of teaching and learning success can be experienced by all levels of learners. A 10 page introductory summary will precede the video contents, sample lesson plans, outlines, and student and teacher handouts to support the curriculum for teaching with alternate learning styles. The Application summary and video demonstration will be supported using the classical and contemporary theories of Albert Bandura (1977), Howard Gardner (1989), and Jean Piaget (1965) found in the Breadth, with evidence from current empirical knowledge found in scholarly journals and articles included in the Depth.

Background of Learning Style Differences

In a perfect world, all systems of teaching and learning would validate the intrinsic worth of each and every child, recognizing all levels of learning. Knowing that life does not evolve in a perfect world, educators must take the responsibility to teach to all levels of learners within the classroom. As a result of federally mandated legislature, specifically the Individuals with Disabilities Education Act (IDEA), students with identified learning disabilities are currently mainstreamed into the majority of classrooms nationwide (Nyugen, 2002; Snowden, 2003). The placement, assimilation, and assessment of students identified with learning disabilities in academia teeter on how fair the interpretations are enacted by legislators, and if justice is served to all levels of learners with the mandated policies within the educational setting. A deeper understanding of intelligence, learning, and motivational differences provides answers for better possibilities to adapt regular education classrooms for all levels of learners. Mainstreaming special education students into regular education classrooms is an urgent social issue in educational settings.

An understanding for the need to adapt curriculum to all students' abilities within the mainstream classroom environment will ease the enormous social issue facing educators. The differences between regular education student learning abilities and the abilities of students with identified disabilities remains a mystery to educators if teacher training is not incorporated into workshops, seminars, or in-services. Educators need tools to teach self reliance and management of learning and motivation to all levels of students (Gardner, 1989). Although there are common patterns in human learning, each human being develops in a unique way at an individual rate. It

is up to caretakers, educators, and parents to discover and explore the uniqueness of each individual using the patterns of intelligence, learning, and motivation.

If cognitive functions are misunderstood or misinterpreted, management and balance related to human intelligence, learning, and motivation may result in negative outcomes. Throughout adolescence, teenagers with or without learning disabilities are operating within a crisis mode where impulsive decisions may surface at any time to keep up with peers. Older teenagers strive for individuality without the need to please anyone else but self, as Levine's (1995) research reveals, "Maturing nervous systems are working overtime to define individuality" (p. 5).

If impulsivity leads one into harms way, then control is lacking which may be due to an immature development of the learning process, and not the need for special education services. Despite the confusion that often accompanies an accurate identification of a student's learning disability, all students deserve the right to the best educational opportunities. A learning disability does not diminish the individuality of a human being capable of intellectual growth and the potential for learning and motivational development (Winebrenner, 1996).

All students can learn, as Piaget (1965) stressed, "Children have a real understanding only of that which they invent themselves, and each time that we try to teach them something too quickly, we keep them from reinventing it themselves" (cited in Papert, 1999). Development through experience from the environment become part of behavior patterns (Bandura, 1977), if children are exposed to experiences and allowed to process the experiences through their own invention. Using the cognitive function of memory coupled with vicarious experiences, Bandura states, "The highest level of observational learning is achieved by first organizing and rehearsing

the modeled behavior symbolically, and then enacting it overtly” (p. 27). Taking the concepts of reinvention from Piaget (1965), and development through experiences from Bandura (1977), a multiple learning styles theory espoused by Howard Gardner (1989) emerged.

Howard Gardner’s theory of Multiple Intelligences (1983) recognizes seven areas of intelligence to consider in developing curriculum for all levels of learners. The realization that current classroom curricular practices can be easily adapted to reach all learners by using classical and contemporary theory guidelines offers more opportunity for all learners to reach full learning potential. The hidden advantage to any changes in current curriculum to accommodate students with learning styles outside the accepted norm supports the regular student population by providing more enriched environmental experiences.

Simply by observation (Hollin, 2003), knowledge is acquired, “The capacity to learn by observation enables people to acquire large, integrated patterns of behavior without having to form them gradually by tedious trial and error” (Bandura, 1977, p. 12). Every person is created as a unique being with a potential in need of actualization (Maslow, 1968), and the potential increases for each individual student, with or without learning disabilities, with more integrated hands-on curriculum. Recognizing the need for more integrated curriculum, a project proposal in 2001 for a science experiment was developed and can be found in Appendix A on page 11.

Stages of Video Development

Project Skate: Science through Skateboarding was developed by the researcher in 2001 to incorporate Gardner’s Multiple Intelligences Theory (1983, 1993) into science curriculum for all levels of student learners, with or without learning disabilities. Throughout the video 14 high school students, ages 14-17 actively participate over a two day period, demonstrating examples

of reinventing science concepts for themselves (Piaget, 1965), as concrete experiences (Bandura, 1977) develop. The experiment can be used with special education students as well as regular education students, as different levels of cognitive skills are recognized and incorporated into the lesson plans found in Appendixes B-E on pages 13-19.

Scientific concepts are incorporated into the curriculum using a connection to student interests through skateboards and skateboarding vocabulary. The alternate style of teaching and learning incorporates the two most commonly used intellectual strengths, linguistic and logical intelligence. A more balanced presentation was needed, so the remaining five intellectual strengths were included: spatial, bodily kinesthetic, musical, interpersonal, and intrapersonal strengths so that success can be experienced by all levels of learners. The Laws of Motion discovered by Sir Isaac Newton, described in Appendix A are the core scientific concepts being taught in the video, with an extended vocabulary list found on page 12. The video transcripts detailed in Appendix B and found on pages 13-15 introduce The Scientific Method with curriculum adapted for students in need of teaching styles to accommodate learning disabilities.

Adapting the Project Skate: Science through Skateboarding curriculum to a lower grade level is demonstrated in Appendix C found on page 16, emphasizing the scientific concept of *mass* at the 4th grade reading level. Classroom curricular practices can be easily adapted to reach all learners and is demonstrated through the variety of adapted curriculum examples found in Appendixes A-G on pages 11-24. Opportunity for all levels of students to reach full learning potential, with or without learning disabilities, is offered when curriculum is adapted to student strengths. The hidden advantage to any changes in current curriculum to accommodate students

with learning styles outside the accepted norm supports the regular student population by providing more enriched hands-on environmental experiences.

The Project Skate: Science through Skateboarding experiment found in Appendix E was adapted for 5th grade curriculum. Figure 1 shows a regular 5th grade classroom consisting of 20% immersion students learning English for the first time, 20% special education students identified with various learning disabilities, 10% gifted students, and the remainder are regular students. The curriculum adaption incorporates all learning levels within one classroom.



Figure 1: A typical 5th grade classroom with a variety of learning levels in need of curriculum adaption using the Project Skate experiment from Appendix E found on page 19.



Figure 2: When students bring familiar artifacts from home, connecting the real world with the world of teaching and learning, abstract thought processing begins to form. It is up to caretakers, educators, and parents to discover and explore the uniqueness of each individual using the patterns of intelligence, learning, and motivation.

Intervention and Strategy List (Winebrenner, 1996)

- Never do for students what they can do for themselves
- Talk slowly
- Allow students to take tests in untimed situations
- Give hyperactive students opportunities to move: pass out papers, take messages to office
- Make learning concrete with hands-on artifacts
- Find alternatives to large group work

- Never assume that students who struggle are not working hard
- Incorporate music wherever possible
- Do not be afraid to move outside the classroom to teach a lesson or two
- Use humor frequently
- Deal effectively with behavior
- Do not excuse students with disabilities from participation

Conclusion

As demands for more effective education rise, teachers rise to the challenge. High school is the last stage of formal education before the experiences of the real world challenge many students. Not all students attend college. What students face in the real world, outside the sheltered walls of school life does not appear on an IQ test. Educators rise to the challenge of preparing for the 21st century by bridging the gap between school, the community, and the real world outside of school by abandoning past practices for new innovative teaching.

Adapting to the new realities, as Bandura (1977) suggests, empowers youth to educate themselves beyond what is offered in classrooms. Teachers, parents, and educators must teach that learning and motivation is within the normal realm of human development and that it can be managed with a deeper understanding of individual strengths. “It is only by knowing our individual nature with its limitations as well as its resources that we grow capable of coming out of ourselves and collaborating with other individual natures” (Piaget, 1965, p. 394). Abandoning past practices for new innovative teaching broadens the understanding of the range of *normal* conducive to the different learning styles, thus allowing teachers not just to tolerate, but to celebrate the uniqueness of individuals. “If they can’t learn the way we teach them, then let’s teach them the way they learn,” (Dr, Kenneth Dunn, found in Winebrenner, 1996, p. iii).

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Appendix A

Project Proposal: The Science Behind Skateboarding--Project Skate

Question: Why does a skateboard stick to the skaters' feet? How do the skaters stay in the air so long when they do tricks with their boards? Where does the power come from to jump so high?

A proposed science project will be a lesson on the science behind skateboarding, designed to teach high school resource students with reading levels from 4th through 9th grade. Incorporating auditory skills as well as using visual aids will be used to enhance the lesson due to the need for altering the curriculum to accommodate any areas of strength that the students' style of learning requires. Hands-on materials will also be included because many students learn through the sense of touch. Howard Gardner's Theory of Multiple Intelligences (1983, 1993) identifies seven categories of intelligences that will be included in the project. Linguistic, logical, spatial, bodily kinesthetic, musical, interpersonal, and intrapersonal strengths present a more balanced approach to reach all levels of learners.

The median of skateboards was chosen to teach the lesson because the students walk into class carrying their skateboards, so a vested interest in the project and a key to motivation will connect learning to real world experiences (Piaget, 1965; Bandura, 1977).

After interviewing several pro skateboarders, using the proper vocabulary of skating was stressed. Proper terminology through a vocabulary list that relates the science concepts to the students' knowledge (Fowler, 2002) will be used as a homework assignment in the 9th grade level resource science class.

Safety features will conclude the lesson with the demonstration of **impact and force** as seen on video, incorporating the importance of helmets and pads. If the interest level remains

high **centripetal force** will be discussed using the science behind the different *wheels, trucks* and bearings on different surfaces: street, ramps, and sidewalks.

PROPERTIES TO BE INTRODUCED:

Newton's Laws of Motion--First Law: objects move at a constant speed in a straight line
Inertia to be introduced--skateboard pushed across room. Still objects stay at rest.

Second Law--Acceleration--directly proportional to force--light skaters vs. heavier skaters
--inversely proportional to mass--skaters pushing ramps in position

Third Law of Motion--for every action there is an equal and opposite reaction--motion on the half pipe ramp, rolling up u-shape of ramp with different levels of force

VISUAL AIDS: skateboards, ramps; a tri-fold poster with science vocabulary and formulas, and demonstration of science in action by skaters will be created by the students

AUDITORY AIDS: video of skating, demonstrating tricks with verbal explanation of the scientific property behind the trick as it is being performed

TACTUAL AIDS: when explaining the property of **strength**, passing old broken skateboards around to touch will demonstrate the layering effect of the sheets of maple wood which constitutes the **flexibility** of the board. **Friction** will also be *felt* and explained when they feel the grip tape on the top of the board.

References

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Appendix B

Videotape: Project Skate--Science through Skateboarding
 Instructions, explanations, and video transcripts ****Blue commentary denotes audio transcripts**
 Theoretical basis: ***Howard Gardner's Multiple Intelligences Theory (1983, 1993)**
 Concept to be introduced: THE SCIENTIFIC METHOD
 Grade level: High school

INTRODUCTION: SPARKING THE STUDENTS' INTERESTS

Start with a fast action video of any kind that has no words, just a musical rhythmic background. Students have to listen to words so much using **auditory** skills that a fast action musical video gives them a chance to use **visual** skills (**musical and visual/spatial**). Try to use something seen, understood, and enjoyed by the age level of the student, like skateboarding. Start the video before the bell rings and leave it running while you take attendance, collect homework, and take care of the daily requirements to start the class.

Have all the materials to do the experiment on display in front of you because students need to **visually, auditorily, and tactually** digest the lesson while you are speaking.

USING PRIOR KNOWLEDGE

Use whatever sport, activity, skill, etc. you want to get the students to **engage in a discussion** by **asking who has done it, seen it, would like to do it, has a cousin who does it, etc.** Use the **video clip** to cite examples: skateboards are used in the video.

READY FOR SCIENCE

The discussion will create a captive audience. Start the scientific introduction by describing what everyday scientists do. **Scientists are observers**, so the students need to start observing the world in everything they do and everything they see (**verbal/linguistic**).

INTRODUCTION: **THE SCIENTIFIC METHOD**

STEP 1: QUESTION

SCIENTISTS ASK QUESTIONS: (refer to the video) Why do the skateboards stick to the skaters feet? What makes the skateboard go so high? So far? Will one pound make it move? Five pounds?

STEP 2: HYPOTHESIS

SCIENTISTS MAKE GUESSES (HYPOTHESIS): Is it okay to be wrong when you make guesses? Of course wrong guesses are okay; otherwise scientists would never learn new things to make new discoveries. Take a chance with a guess: Five pounds will move the skateboard farther than 1 pound (**mathematical/logical**).

At this point have the **students choose partners** and explain that the experiment they will be performing has to be done twice, once by partner #1 in the first round, then by partner #2 in the second round (**interpersonal**). Explain that **in order for something to become a fact or a law in science, it depends entirely on repeatability**. **Use yourself and several students as examples** of who might do the experiment, explain that **it has to have the same result each time or it is not a proven fact**. When the partners come up together (**bodily kinesthetic**), one is doing the experiment with the previously assigned item, and the other is ready to write down what is observed. The rest of the class also writes each step on an individual (**intrapersonal**) pre-designed worksheet, which has been written on the board so those who are **visual learners** can not only hear it, but see it.

STEP 3: EXPERIMENT

SCIENTISTS DO EXPERIMENTS: Write down what happened: We took a skateboard, put a box on top of it then **threw** different weighted item in the box to see how far it would move. The 5 pound bag of macaroni only went 24 inches, but the package of 6 rolls of toilet paper went 32 inches...or makes a chart, graph or table of the results. **Write down** mistakes: the bag of rice bounced out before the skateboard moved very far, only 6 inches.

STEP 4: OBSERVATION

SCIENTISTS ALWAYS MAKE OBSERVATIONS: Students need to quietly write what they see is happening, giving as much detail as possible on the worksheet, telling why things worked or did not.

STEP 5: CONCLUSION

SCIENTISTS WRITE CONCLUSIONS: This step is your chance to tell if you were right or wrong in your guess (hypothesis). **REMEMBER IT IS OKAY TO BE WRONG!** Very often you will end up with more questions in your conclusion, so write them down.

A scientist's work is never done, so now that you have ended with more questions, (or maybe you have succeeded), you have to **repeat the experiment** using the same five step process of the **SCIENTIFIC METHOD**: QUESTION, HYPOTHESIS, EXPERIMENT, OBSERVATION, and CONCLUSION. Each student repeats the experiment in the video.

Appendix C

Science Experiment: Project Skate--Mass Using Skateboards

Science Concepts: Newton's Laws of Motion and The Scientific Method

Grade level: 4th-5th grade

Theoretical basis: Howard Gardner's Theory of Multiple Intelligences incorporates linguistic, logical, spatial, bodily kinesthetic, musical, interpersonal, and intrapersonal strengths and presents a more balanced approach to reach all levels of learners.

PROBLEM: Will the weight of an object affect how far a skateboard moves when an object is tossed into a box on top of the skateboard?

HYPOTHESIS: The heavier the object, the farther the skateboard moves.

PROCEDURE:

1. Place a box on top of a skateboard on a floor, not a carpet, with about a ten foot clearance path.
2. Line up 6 to 10 items (with various weights) from heaviest to lightest on a table behind skateboard.
3. Standing back 2 feet from skateboard with box placed on top, toss one item at a time into box.
4. Place a piece of masking tape when front wheels of skateboard stop after each item is tossed.

MATERIALS:

SKATEBOARD

BOX WITHOUT LID

6 TO 10 ITEMS- a small pillow, 1 pkg. toilet paper,

1 roll paper towels, 1 box tissues, 1 lb. bag rice,

5 lb. bag macaroni noodles

MASKING TAPE

DATA OBSERVATIONS: heavier objects (more mass) moved the skateboard farther.

CONCLUSION: Objects with more mass, when tossed with force, cause the skateboard to roll farther due to Newton's Laws of Motion.

Appendix D

Curriculum Alignment with State Standards: Project Skate: Science through Skateboarding

Seven Step Lesson Plan Outline

Task Analysis: Teacher has observed the popularity of skateboards with a majority of the students, so this lesson was designed to teach Newton's Laws of Motion, specifically mass and how force accelerates an object.

Objective: Students will be able to choose partners, determine the weight of various items by visual observations, complete the experiment and understand that mass affects acceleration.

Standard: Grade 8--Focus on Physical Science--Forces #2f: The greater the mass of an object, the more force needed to achieve the same rate of change in motion.

Theoretical basis: Howard Gardner's Theory of Multiple Intelligences incorporates linguistic, logical, spatial, bodily kinesthetic, musical, interpersonal, and intrapersonal strengths and presents a more balanced approach to reach all levels of learners.

1. Set: SPARKING STUDENT INTEREST

Start with a fast action video of any kind that has no words, just a music background.

They have to listen so much using auditory skills, give them a chance to just use visual skills.

Try to use something they have seen, understand and enjoy, like skateboarding. Start the video before the tardy bell rings and let it go while you take roll, etc.

Have all the materials to do the experiment on display in front of you because many students need to visually, auditorily and tactually digest the lesson while you are speaking.

2. Directed Teaching: USING PRIOR KNOWLEDGE

Use whatever sport, activity, skill, etc. you want to get the students to engage in a discussion by asking who has done it, seen it, would like to do it, has a cousin who does it, etc.

Use the video to cite examples.

3. Checking for understanding: READY FOR SCIENTIFIC METHOD

Now that you have a captive audience, start by telling what everyday scientists do.

Scientists are observers, so tell the students to start observing the world in everything they do and everything they see. Introduce Scientific Method which starts with asking questions, and then proceed to explain the steps in the process. Pass out the outline and observe as they fill it out.

4. Corrective Teaching: CIRCULATE AND LISTEN TO DISCUSSION

If steps in Scientific Process are incorrectly filled out on outline sheet, correct accordingly.

5. Guided Practice: STUDENTS TAKE TURNS DOING EXPERIMENT WITH CLASS

6. Closure: STUDENTS SHARE WHAT THEY LEARNED

7. Independent Practice: HOMEWORK: TRY IT AT HOME. WRITE NEWLY FORMED CONCLUSIONS

Variations: Use different items, with similar weights to the original items, and retry the experiment. Use different skateboards, possibly side by side, and then call it a contest.

Appendix E

CALLA INSTRUCTIONAL PLAN (Chamot & O'Malley, 1994)

Subject: **The Science Behind Skateboarding: Project Skate**

ESL Level: Beginning to intermediate

Topic: Newton's Laws of Motion and Scientific Method

Grades: adaptable for 4th through high school

State Standards: 8th grade--physical science--motion, forces, density

9th through high school--physics: motion and forces

Content Objective: Students will learn Laws of Motion and Scientific Method

Language Objective: Listening--students will understand Laws of Motion and Scientific Method

Reading--students will connect skateboarding to science concepts

Speaking--students will answer questions, share with partners, ask questions

Writing--students will do worksheets re: laws of motion, scientific method

Learning Strategies: Cognitive, metacognitive, and social/affective strategies will be incorporated in the following manner, through the preparation, presentation, practice, evaluation and expansion procedure

PRIOR KNOWLEDGE: QUESTIONS FOR QUALITY THINKING:

Why does the skateboard stick to the skaters' feet?

How do the skaters stay in the air so long when they do tricks with their boards?

Where does the power come from to jump so high?

The CALLA extended lesson is a **science** project involving the science behind skateboarding,

designed to teach high school resource students with reading levels from 4th through 9th

grade. Auditory as well as **visual** aids will be incorporated to enhance the lesson due to student disabilities. **Hands-on** materials will also be included because many students learn through the **sense of touch**. The median of skateboards was chosen to teach the lesson because the students walk into class carrying skateboards, so **a vested interest in the project** exists. Motivation is the key to learning.

VOCABULARY DEVELOPMENT

After interviewing several pro skateboarders, learning the **vocabulary** of skating was stressed, so proper terminology to relate the science concepts to the students will be taught.

PROPERTIES TO BE INTRODUCED THROUGH VOCABULARY DEVELOPMENT:

Newton's Laws of Motion--First Law: moving objects will move at a constant speed in a straight line--**inertia** to be introduced--skateboard pushed across room. Still objects stay at rest.

Second Law--Acceleration--directly proportional to force--light skaters vs. heavier skaters -- inversely proportional to mass--skaters pushing ramps in position

Third Law of Motion--for every action there is an equal and opposite reaction--motion on the half pipe ramp, rolling up u-shape of ramp with different levels of force

MULTIPLE INTELLIGENCES LESSON PLAN FOR SCIENCE THROUGH SKATEBOARDING

Howard Gardner's Theory of Multiple Intelligences (1983, 1993) identifies seven categories of intelligences that will be included in the project. Linguistic, logical, spatial, bodily kinesthetic, musical, interpersonal, and intrapersonal strengths present a more balanced approach to reach all levels of learners.

VISUAL AIDS: skateboards, ramps, tri-fold poster with science vocabulary and formulas, and demonstration of science in action by skaters

AUDITORY AIDS: video of skating, demonstrating tricks with verbal explanation of the scientific property behind the trick as it is being performed

TACTUAL AIDS: when explaining the property of **strength**, have old broken boards to pass around to demonstrate the layering effect of the sheets of maple wood which constitutes the **flexibility** of the board. **Friction** will also be *felt* and explained when they feel the grip tape on the top of the board.

Conclude the lesson with the safety features necessary to be a safe skater by displaying **impact and force** on video, incorporating the importance of helmets and pads. If the interest level remains high, incorporate **centripetal force** and discuss the science behind the different wheels, trucks and bearings on different surfaces: street, ramps and sidewalks.

EXPANSION

Through Internet research, students will access websites that expand on the skateboarders from their country. Japan and China are especially rich in skateboard activity.

Appendix F

Handout for a quiz of the concepts of the **degrees in a circle**, explained in the first 15 minutes of the skateboarding video, indicating how to cross curriculum with mathematics and science.

Tony Hawk 900 Quiz

What is a “900?”

Do the Math and show your work.

How many degrees would two complete revolutions make?

What is a “1080?” Explain it mathematically.

Appendix G

Textbook Alignment with Science State Standards and Gardner's Multiple Intelligences Theory

Grade Level: 5th

Overview: The Discovery Works text for Science from Houghton Mifflin successfully integrates the CA Science Content Standards for 5th grade, as well as the 5th grade standards for Math, Language Arts Reading, and for Language Arts Writing. The student text and the Teacher's Guide are concise, divided into five easy to follow Units A-E. Supplemental materials are provided through five non-consumable soft-cover books which include workbooks, extra practice, assessment, ELD, and CA standardized test practice. All 5th grade teachers are provided with the soft-cover material and teacher resource books for each unit. Color copies of CA State Standards are attached for explanation when alpha-numeric references are cited on the lesson plan schedule for content alignment.

General Directions (The Big Picture): Science Content Standards for CA public schools, 5th grade level, cover four areas with requirements in Physical, Life and Earth Science, and the area of Investigation and Experimentation. Beginning with Investigation and Experimentation the first week of school, simply discuss how we will all become scientists throughout the school year by observing the world around us every day. This initial discussion will build a strong base for scientific experiments using the concepts of The Scientific Method: 1. Question 2. Hypothesis 3. Experiment 4. Observation 5. Conclusion.

By conducting experiments using the 5 step Scientific Method during and at the conclusion of each unit, the students will be practicing Content Standards 6 a-i. We continue in Earth Science teaching weather patterns in the first quarter, Content Standards 4 a-e, with a natural progression

into the water cycle, Content Standards 3 a-e. We will conclude the first quarter curriculum in November with an assembly called Environmental Defenders which teaches water conservation, Content Standards 3 d and e, presented by the Upper San Gabriel Valley Municipal Water District. The second quarter curriculum begins in December with Life and Physical Science teaching Structures of Animals and Plants, preparing the students to complete a vacation assignment by keeping a chart for two weeks on their digestive system, covering Content Standards 2 a-g, focusing on 2 d, the role of the kidney. A field trip to the CA Science Museum will support our Life and Physical Science lessons on Structures of Animals and Plants, scheduled for Thursday, December 12th, at 10 a.m. After vacation, the second quarter curriculum concludes with the remainder of the Life Science lessons on Structures of Animals and Plants. The third quarter curriculum begins with Physical Science, Elements, Content Standards 1 a-i, and concludes with a review of the Solar System, Content Standards 5 a-c. Practice testing for SAT 9 will begin and continue up until the first scheduled SAT 9 test. The CA Standards Practice Tests are provided with Discovery Works. The fourth quarter will consist of a review of The Scientific Method in preparation for the Science Fair. After the Science Fair, curriculum is each teacher's choice for whatever your students need to review from weather, water, systems of animals and plants, elements, or the solar system. Refer to color copy of state standards for choices of the units that you need to review.

Note to 5th grade teachers: During grade level meetings discussion and exchange of supplemental materials can transpire before new units are approached.

Appendix H

Parent/Guardian Permission to use photographs for educational purposes:

I give my permission for Mrs. Swindler to use my student's photographs for class projects, Internet projects, and educational purposes regarding 5th grade curriculum development.

Student Name _____

Parent or Guardian _____

Date _____

Appendix References

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