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ABSTRACT

There are no throw away children. Each child is an individual who deserves to experience personal achievement. History has demonstrated the dangers of a survival of the fittest philosophy. A civilized society is one that includes all its citizens, the weak as well as the strong. Students are placed at-risk when their silent cries for help are ignored. Teachers must go the extra mile and beyond the normal boundaries to maximize the potential of their students. Mentoring students involves building nurturing relationships as well as guiding students toward self-sufficiency and self-management. The goal of mentoring is to eventually produce responsible and independent individuals who are able to advocate for them. Education systems must go beyond the products or outcomes of schooling and include knowledge and skills essential for socialization, citizenship, and human development. Mentoring realizes this obligation by involving the whole child in the search of islands of competence. It involves all the essential dimensions of the human condition: the intellectual, the physical, the aesthetic, the spiritual, the emotional, and the social. (Contains 25 references.) (MVL)

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Mentoring and Constructivism: Preparing Students with Disabilities for Careers in Science

by
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MENTORING AND CONSTRUCTIVISM: PREPARING STUDENTS WITH DISABILITIES FOR CAREERS IN SCIENCE

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Mentoring serves many purposes within the educational community. It is an avenue that can provide the support needed to meet the needs and concerns of students with disabilities. The inclusive movement, although desirable, has in many ways placed students with disabilities at further risk. Simply placing these students in classrooms with non-disabled peers does not guarantee success. They need guidance, encouragement, and assistance to counteract many of the behaviors and characteristics attributed to academic and/or social deficits. They need personalized assistance often lacking in an inclusive classroom.

Lack of motivation is often cited as a common characteristic among individuals with disabilities, especially those with learning disabilities (Gordon, Lewandowski, & Keiser, 1999) and this apathy often compromises the students' performance on school related tasks to be compromised. Just as their peers without disabilities, individuals with disabilities seek to be viewed by others as capable human beings. When others perceive individuals with disabilities as less able, they become less motivated and life becomes a self-fulfilling prophecy (King, Cathers, Polgar, MacKinnon, & Havens, 2000). Motivation is a key factor for academic success for any student (Feigenbaum, 2000). Due to the lack of successful experiences and a perception of being "different", individuals with disabilities frequently lack self-confidence leading to the vicious cycle described above. Unmotivated students eventually stop trying. This condition is described as learned helplessness. Learned helplessness among individuals with

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disabilities contributes to unsuccessful learning and ineffective social development. Individuals with disabilities, especially individuals with learning and behavior problems, often exhibit poor interpersonal skills directly affecting their abilities to function successfully in school and beyond (Werner, 1993). Just placing students in inclusive settings does not necessarily guarantee progress in socialization or academic success. Students need to be mentored along the way to help them break the cycle of self-helplessness and empower them to aspire towards self-fulfillment.

In their transition to adulthood, students with disabilities require learning many skills to find success in the adult world, as well as to manage their disabilities. Additionally, those who are in late adolescence are on the verge of many changes in their lives. While these adolescents have the same aspirations and hopes with respect to adult issues such as employment, social issues, and living, these issues are complicated by the disability, which often leads once again to problems of motivation (Cummings, Maddux, & Casey, 2000). These students can benefit from the assistance of mentors who can guide them and provide encouragement in the difficult transition into adulthood.

Fostering Resiliency Via Mentoring

Psychological and Social Needs

John Dewey (1938) believed in an education that would educate the whole child. Six decades later educators are still predominantly concerned with academic standards and cognitive skills. Students who fail to meet these standards are frequently referred to special education, labeled, and segregated. Negative consequences of labeling and segregating students with disabilities are self-defeating attitudes and behaviors. Adults must communicate a deep belief in their students' capacity to be resilient and support

them in overcoming their difficulties through their unique strengths. Resiliency is the ability to spring back from and adapt to adversity. The literature on resiliency conveys messages of hope and success (Bernard, 1991). It challenges the notion that "high risk" youngsters are doomed to environmental and situational adversities. Adults who convey appreciation for students' strengths rather than dwell on deficits can expect cognitive as well as emotional growth. Following interviews with counselors, Ridley (1999) summarized four convictions that are crucial to believing in students' resiliency and in maintaining faith and hope in the face of adversity.

- Belief One: A belief that kindness and caring are more common and powerful than violence and hate.
- Belief Two: A belief that adults who work with youngsters must view themselves as a team of mentors or helpers who can make a positive difference in the lives of students.
- Belief Three: A belief that most individuals are survivors and are able to bounce back from adversity.
- Belief Four: A belief that human beings possess extraordinary forces that is beyond our comprehension. Individuals such as Helen Keller, Franklin Delano Roosevelt, Albert Einstein, and many others have demonstrated such extraordinary forces.

Psychologists such as Maslow (1970) and Glasser (1992) emphasize that all individuals have certain psychological needs by virtue of being human. The need for love and belonging can be met in classrooms when teachers establish caring relationships that transmit high expectations and faith in their students' resilient abilities. Mentoring can create relationships that are instrumental to building a sense of acceptance and belonging. Freedman (1996) in his book *The Kindness of Strangers* explains that the

most successful adult mentors are the ones who establish friendships with young people and not the ones who sermonize and admonish. Everyone has a need for social acceptance, especially children who are in the process of developing and becoming. Social psychologists have added the social needs for affiliation, power, and achievement to the psychological needs of love and belonging (Fyano, 1980). Educators can facilitate acquisition of these social needs through inclusive education and by empowering students through interpersonal involvement and personal acknowledgement. Every student needs to be acknowledged as an individual in his and her own right. While being different from each other in many respects, each student must recognize that he/she has equal needs and rights as a person. Students can bounce back and strive for more when they are not submerged in a faceless group. The large enrollment of students in public schools is causing concern among general as well as special educators and a need for personalized learning is increasingly being heard. Ted Sizer (1999) challenges educators with thought-provoking questions:

> 'How can we make learning meaningful when our lives are so busy, our students anonymous and our curriculum cover all topics?' and
> 'We cannot teach students well if we do not know them well. At its heart, personalized learning requires profound shifts in our thinking about education and schooling." (p.6).

These questions lead to a profound shift that must be given serious consideration. Mentors can create a meaningful bond and personalize instruction for students with special needs.

Resiliency and Coping Interventions

Brooks (1999) reviewed social problems often encountered by students with disabilities. The most frequent types include: (1) needing social approval, (2) a feeling of being different or inferior which leads to low social self-concept, (3) misinterpreting cues and goals of peer behavior, (4) misunderstanding goals and consequences of their behavior and (5) failing to use social support from others. Perry and Bard (2000) identified more specific problem behaviors attributed to students with disabilities that can impair learning and block the acquisition of pro-social skills. They are:

- Low social self-concept (stigma of disability)
- Fear of bullies
- Teases Others
- Modeling negative behavior
- Social withdrawal
- Physical aggression

Successful proactive interventions must include mentoring students in social and emotional competence in order to be accepted in inclusive classrooms. Richardson (1996) emphasizes cognitive-behavioral strategies such as role-playing and verbal mediation (self-talk) to develop self-efficacy. Students with disabilities can be mentored to become their own advocates by learning about their rights as citizens and human beings. Mentoring, above all, requires a caring, trusting, and genuine relationship that encourages students to reach their potential. When students posses a sense of their own efficacy they will bounce back. In order for mentoring programs to be successful, they

must be implemented systematically and include the support of all concerned parties including school personnel, families, and community based organizations.

Mentoring Programs

Involved school principals are crucial to the success of mentoring programs. Administrators must provide the support and resources necessary to accomplish the mentoring goals. Teachers along with parents have the potential to implement a successful mentoring program when the principal nurtures and supports their efforts. Noll (1997) developed a cross-age mentoring program in which ninth graders worked in cooperative learning program to teach social skills to seventh graders with learning disabilities. Results suggested that the seventh graders had an increased sense of inclusion and reduced acting-out behavior, and the ninth graders had increases in self-esteem and improved conflict-resolution skills. Sonnenblick (1997) studied middle-school girls who lacked a sense of belonging, putting them at-risk for dropping out of school and becoming involved with gangs. She instituted the Girls Acquiring Leadership Skills Through Service (GALS) Club. The purpose of this club was to involve at-risk girls in the school community and thereby increase their sense of belonging. Results suggested that students became more self-assured and mature and that they took more responsibility for themselves within the club.

The DO-IT programs for mentoring students with disabilities targets high school students with disabilities interested in careers in science, math, or engineering. Primary funding for this program was provided by the National Science Foundation. Each summer, participants spend two weeks at the University of Washington attending labs and lectures to get a feel for college life. Additionally, participants meet with faculty and

student mentors, many with disabilities themselves, to learn how new technology is making it easier for them to pursue degrees and careers in fields once thought out of reach. Throughout the year, DO-IT scholars use home computers and electronic mail to communicate with one another and with mentors around the world. These cyber-relationships provide a source of encouragement and a sense of community to the students who must often overcome common challenges in pursuing their goals (Orwig, 2001).

Community service projects teaches students to transfer learned skills into practical reality. The ELF (Edward Little Franklin) Woods Project is one of many fostered by the KIDS (Kids Involved Doing Service) Consortium, a private non-profit organization. This program engages students in working to solve real-world problems in their communities as part of math, science, English, social studies, and other subjects. The projects engaged in involve many different activities and result in participants "getting involved" in making a difference, not just as a "nice" activity, but as an integral part of comprehensive planning and educational reform efforts. This process substantively addresses academic failure and lack of social bonding, the risk factors most common to substance abuse, juvenile delinquency, teen pregnancy, suicide, school dropout, and other destructive factors. In fact, research has shown that opportunities for young people to participate in the life of the community enables them to develop problem solving abilities, social competence, autonomy, and sense of hope and future attributes that enable them to "bounce back" from at-risk environments (Henderson, Bernard, & Sharp-Light, 1999).

Constructivism or Reductionism?

In science education, inquiry models are used to promote student understanding of scientific concepts and processes. Inquiry instruction is based on the concept of constructivism, which means that individuals build on their prior knowledge. The teacher is a facilitator and guides the students as they construct their new knowledge (Ward, 2001). Advantaged children have been enlightened about the natural and cultural world in their daily experiences and interactions. However, disadvantaged children and those with special needs require an explicit approach to learning because of their lack of exposure and/or learning difficulties (Hirsch & Moats, 2001). They require explicit instruction and strategies. In a review of the research, Gersten, Carnine, & Woodward (1987) evaluated six studies of direct instruction curricula and discovered that this method of teaching tends to produce high academic gains for students with disabilities and with low income students. Nevertheless, constructivist instruction cannot be dismissed for these students. Mentors can involve their charges in reductionist (skill learning, direct instruction) as well as in constructivist (inquiry, discovery) learning. Mentors can provide direct instruction and guide their protégées towards activities that promote discovery. Students with mild to moderate disabilities frequently exhibit problems with memory, attention, fluency, generalization, metacognition and motivation (Mercer & Mercer, 2001). Discovery activities in addition to direct instruction can awake the "aha" factor. Students can see the relevance of concepts being taught. When students construct learning they construct meaning. They make sense of the information provided through direct instruction. Students with disabilities need encouragement to raise their self-esteem. A feeling of "I can" can be achieved through self-empowerment

and involvement. Hands-on science activities are fun and engaging. They provide motivation that, in turn, increases attention and memory retention. They open windows into the student's minds thus securing the probability of transfer and generalization of knowledge.

Discussion

There are no 'throw away' children. Each child is an individual who deserves to experience personal achievement. History has demonstrated the dangers of a "survival of the fittest" philosophy. A civilized society is one that includes all its citizens, the weak as well as the strong. We place students at-risk when we ignore their silent cries for help. Teachers must go the extra mile and beyond the normal boundaries to maximize the potential of their students. Mentoring students involves building nurturing relationships as well as guiding students toward self-sufficiency and self-management. The goal of mentoring is to eventually produce responsible and independent individuals who are able to advocate for them. Education systems must go beyond the products or outcomes of schooling and include knowledge and skills essential for socialization, citizenship, and human development. Mentoring realizes this obligation by involving the whole child in the search for "islands of competence". It involves all the essential dimensions of the human condition: the intellectual, the physical, the aesthetic, the spiritual, the emotional, and the social.

According to Freedman (1993), mentoring offers the opportunity to identify and realize our shared humanity.

> Mentoring amounts to the 'elementary school of caring' for other people's children, the children of the poor. It is a specific context in which to

initiate the process of reconstructing empathy...Mentoring brings us together – across generation, class, and often race – in a manner that forces us to acknowledge our interdependence, to appreciate, in Martin Luther King, Jr.'s words, that 'we are caught in an inescapable network of mutuality, tied to a single garment of destiny' (pp. 134, 141).

References

Bernard, B. (1991). *Fostering resiliency in kids: Protective factors in the family, school, and community).* Portland, OR: Western Center for Drug Free Schools and Communities.

Brooks, R. (1999). Fostering resiliency in exceptional children: The search for islands of competence. In V.L. Schwean, & D.H. Saklofske, (Eds). *Handbook of psychosocial characteristics of exceptional children.* New York: Plenum.

Cummings, R., Maddux, C.D., & Casey, J. (2000). Individualized transition planning for students with learning disabilities. *The Career Development Quarterly, 49*(1), 60-72.

Dewey, J. (1938). *Experience and education.* New York: Collier.

Feigenbaum, R. (2000). Algebra for students with learning disabilities. *The Mathematics Teacher, 93*(4), 270-274.

Freedman, M. (1993). *Adult mentors, urban youth, and the new voluntarism.* New York: Jossey-Bass.

Freedman, M. (1996). *The kindness of strangers: Adult mentors, urban youth, and the new voluntarism.* San Francisco, CA: Jossey-Bass.

Fyano, L. (1980). *Achievement motivation.* New York; Plenum.

Gertsen, R., Carnine, D., & Woodward, J. (1987). Direct instruction research: The third decade. *Remedial and Special Education, 8*(6), 48-56.

Glasser, W. (1992). *The quality school: Managing students without coercion.* New York: Harper Perennial.

Gordon, M., Lewandowski, L., & Keiser, S. (1999). The LD label for relatively well-functioning students: A critical analysis. *Journal of Learning Disabilities, 32*(6), 485-490.

Henderson, N., Benard, B., & Sharp-Light, N. (Eds.). (1999). Sharing the power: The ELF woods project taps the energy and talents of students as they improve the community. In *Resiliency in Action: Practical ideas for overcoming risks and building Strengths in Youth, Families, & Communities.* Gorham, ME: Resiliency In Action, Inc.

Hirsch, E.D., & Moats, L.C. (2001, Summer). Overcoming the language gap. *American Educator: American Federation of Teachers, 4-9.*

King, G. A., Cathers, T., Polgar, J. M., MacKinnon, E., & Havens, L. (2000). Success in life for older adolescents with cerebral palsy. *Qualitative Health Research, 10*(6), 734-749.

Maslow, A. (1970). *Motivation and personality.* New York: Harper and Row.

Mercer, C. D., & Mercer, A.R. (2001). *Teaching students with learning problems.* Upper Saddle River, N.J. Merrill Prentice Hall.

Noll, V. (1997). Cross-age mentoring program for social skills development. *The School Counselor, 44,* 239-241.

Orwig, G. (2001). *White house honors UW program for mentoring students with disabilities.* Seattle, WA: University of Washington, Office of News and Information. Available at: http://www.washington.edu/doit/Newsflash/newsflash.09.10.97.html)

Perry, J, & Bard, E. (2000). *Resiliency and coping interventions for students with disabilities.* Paper presented at the Annual Conference of the National Association of School Psychologists, New Orleans, LA.

Richardson, R.C. (1996). Connecting with others: *Teaching social and emotional competence.* Champaign, IL: Research Press.

Ridley K. (1999). Protective beliefs are a key to professionals' and students' resilience. In N. Henderson, B. Bernard, & N. Sharp-Light, (Eds.). *Resiliency in action: Practical ideas for overcoming risks and building strengths in youth, families, and communities.* Gorham, ME: Resiliency in Action Inc.

Sizer, T. (1999). No two are quite alike. *Educational Leadership, 57*(1), 6-11.

Sonnenblick, M. D. (1997). The GALS Club: Promoting belonging among at-risk adolescent girls. *The School Counselor, 44,* 243-245.

Ward, C.D. (2001). Under construction: On becoming a constructivist in view of the standards. *Mathematics Teacher, 94*(2), 94-96.

Werner, E. E. (1993). Risk and resilience in individuals with learning disabilities: Lessons learned from the Kauai longitudinal study. *Learning Disabilities Research & Practice, 8*(1), 28-34.

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