

## **Social Adjustment of At-Risk Technology Education Students**

Educators at all academic levels strive to provide students with a high-quality education while maintaining an environment that promotes learning as well as the health and well-being of each individual. However, in a 2011 study, Preble and Gordon recognized that there are confounding difficulties challenging K–12 education, such as student feelings of social isolation and collective student emotional needs not being adequately met. Students identified with at-risk indicators (students with disabilities, students from economically disadvantaged families, or students with limited English proficiency) are specifically susceptible to experiencing the difficulties firsthand (Ernst, Bottomley, Parry, & Lavelle, 2011). Despite numerous readdress and transformation initiatives, these challenges persist in many schools (Preble & Gordon, 2011). Many of these educational challenges are brought on by low social competence or poor social adjustment (MacKay, Knott, & Dunlop, 2007). Krips, Lehtsaar, and Kukemelk (2011) pose that social competence is composed of dimensions pertaining to personality, appropriateness, communication, and human relations, thus highlighting a critical structure for sociometrics.

Abraham Maslow (1970) identified that once a person's basic physiological and safety needs are satisfied, "there will [then] emerge the love and affection and belongingness need" (p. 20). The school setting is one of the first places where an individual will find himself or herself wanting to fit in. Iyer, Kochenderfer-Ladd, Eisenberg, and Thompson (2010) indicated that, "one of the primary tasks of childhood is successful adjustment in the school context, including consistent academic progress across the school years" (p. 362). Students are not exclusively learning course content; they are also learning how to deal with others in the social environments of classrooms, school, and life. Maslow also stated, "All people in our society have a need or desire for a stable, firmly based, usually high evaluation of themselves, for self-respect or self-esteem, and for the esteem of others" (1970, p. 21). Specific to social competence, investigation addressing the sub-population of students at-risk engaged in technology education courses has been insufficient.

The technology education classroom has potential as a vehicle for students to improve self-esteem, social skills, and ultimately fit in the school environment. Cardon found that "the majority of students that he surveyed stated, 'if they had not been allowed to enroll in the technology education courses, they would have dropped out of school'" (2000, p. 54). Referring to the technology education classroom, Moye (2011) stated that students "get the

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Jeremy V. Ernst (jvernst@vt.edu) is an Assistant Professor in Integrative STEM Education at Virginia Polytechnic Institute and State University. Johnny J. Moye (johnnymoye@gmail.com) is Supervisor of Career and Technical Education at Chesapeake Public Schools, Chesapeake, Virginia.

opportunity to communicate (socialize) with their peers. This interaction will require students to learn and use social skills in a controlled environment, something that may not be possible in other courses and classrooms.” (p. 28). Further supporting the notion that technology education courses help improve students’ social adjustment, Ritz and Moye (2011) identified:

Important parts of this self-efficacy development are the compliments given to strengthen certain performances and to remove negatives by verbally correcting the learner. Again, in an engineering and technology education learning environment, social and verbal persuasion should be natural for teachers. (p. 3)

Technology education offers students a Science, Technology, Engineering, and Mathematics (STEM) based education, while reinforcing the soft skills necessary to be successful in school, in the workplace, and in society (McAlister, 2009; Moye, 2008, 2011). In technology education, information is presented to students in a contextualized manner, facilitating enhanced understanding (Crawford, 2001; CORD, 2010; Moye, 2008; Ritz & Moye, 2011; Threton, 2007). Based on contemporary views of motivation theory, interest and student understanding of the actual educational basis underpinning content provides for motivated learning (Murray, 2011). As learners find motivation and experience successes through educational progression, they develop heightened confidence (Ritz & Moye, 2011). If successful experiences evade students, there is an increased likelihood of occurrence of the “Mathew Effect” (Stanovitch, 1986) and often students “give up on school entirely and physically drop out or they continue slogging along with no real hope of ever really making it in school” (Pete & Fogarty, 2005, p. 8).

Nash (2002) identified that, “cognitive and self-efficacy theories suggest that a positive sense of school coherence, belief that school is a comprehensible, manageable, and responsive environment, may be an important individual-level factor for success at school” (p. 76). This is considerably aligned with current educational trajectories, requiring a robust educational experience that provides students with more than just academics. These fully structured approaches to education are developed to also produce students who are:

Culturally literate, intellectually reflective, and committed to lifelong learning. High-quality education should teach young people to interact in socially skilled and respectful ways; to practice positive, safe, and healthy behaviors; to contribute ethically and responsibly to their peer group, family, school, and community; and to possess basic competencies, work habits, and values as a foundation for meaningful employment and engaged citizenship. (Greenburg, et al., 2003, pp. 466–467)

Considering the broader scope and inclusive expectation of contemporary educational outcomes, formulation of an inviting and healthy school climate that is conducive to the wider spectrum of education that spans academics and social aspects is necessary (Caldarella, Shatzer, Gray, Young, & Young, 2011).

### Definition of Students At-Risk

There are varying definitions of *students at-risk*. Sagor and Cox (2004) identify students at-risk as “any child who is unlikely to graduate on schedule, with both the skills and self-esteem necessary to exercise meaningful options in the areas of work, leisure, culture, civic affairs, and inter/intra personal relationships” (p. 1). McCann and Austin (1988) described three overarching characteristic categorizations of a student at-risk:

1. Learner in severe danger of not attaining the ends of education exhibited through failure to reach local or state standards for high school graduation and/or failure to gain the understandings, skills, and dispositions to become an industrious participant of society
2. Learner who displays actions that instructors categorize as interfering with the learning and educational processes
3. Learner whose domestic or community upbringing and/or experience may place him or her at-risk

Conventionally, educationalists have examined the economic status of students and used it as an initial indication in efforts to determine if a student is at-risk of not succeeding in school (McCann and Austin, 1988). Given the susceptibility for students at-risk to discontinue education and the previously identified value of social competence and social adjustments promotion of school climate and the development of academically conducive environments, what is the degree of social competence for technology education students identified as at-risk? For the purposes of this study, students classified as economically disadvantaged based on receipt of government aid through food vouchers/free or reduced-price school lunch as a result of their family being identified as “low-income” according to the Department of Health and Human Services Poverty Guidelines are at-risk (Department of Health and Human Services, 2011).

### Schooling, Social Climate, and Students At-Risk

The expansion of social competence is a vital objective of education for each learner. Socially vulnerable students are acutely susceptible to social and academic failures (Walker & McConnell, 1995). One significant influencer of socially conducive structure is school climate (Caldarella, et al., 2011). There are many factors that affect school climate. One of the most important factors is “the relationships that students have with their peers and adults in their school” (Preble & Gordon, 2011, p. 15). An adverse school climate results in “inadequate academic performance, unmotivated students, and frustrated teachers” (Preble & Gordon, 2011, p. 11). Improving school climate fosters an enhanced learning environment that promotes student successes and provides the basis for social adjustment. Moyer (2011) identified that there are students who solely attend school as a result of social opportunity. This highlights the strong social basis that school provides beyond academics. Ballentine and Spade (2008) stated, “in the period extending from entry into first grade until entry into

the labor force or marriage, the school class may be regarded as the focal socializing agency” (p. 81). However, there are social aspects of a school’s climate that have lasting negative impacts on students. School climate is one case in which school climate is deteriorated and social adjustment is hindered. However, in an age where schools are struggling to make Annual Yearly Progress (AYP) and trying to improve student standardized test scores, “addressing school climate issues and the social and emotional development of students remain secondary goals of most schools” (Preble & Gordon, 2011, p. 30). Technology education courses provide an opportunity for students to work and learn in a team setting. When students work together, they have the opportunity to communicate (socialize) with one another. In addition to helping improve students’ core academic success, schools can use technology education courses to help improve the school climate.

“Success breeds success. As some students progress through school, the number of successes diminishes” (Moye, 2011, p. 26). People must realize success in an activity in order to have a desire to continue that activity (Maslow, 1970). Students must adequately adjust to the school environment (feel safe and be accepted) in order to fully integrate into a group or class (Tomlinson, 2003). Technology education classrooms could be a resource for developing students’ social adjustment, including those considered at-risk.

### **Research Questions**

The goal and intent of this exploratory research project was to identify the degree of social competence exhibited by technology education students identified as at-risk. Self-control, peer relations, school adjustment, and empathy categorizations provide a depiction of the level of social competence (Walker & McConnell, 1995). Supplemental to the social competence measure, linkages between peer relation and school adjustment competencies were gauged to determine associations.

The following research questions guided this exploratory project:

1. Are there differences in social competence between technology education students considered at-risk and a normative student sample?
2. Is there competence measure association between social competence subscale elements (self-control, peer relations, school adjustment, and empathy) for technology education students identified as at-risk?

Research Question #1 was evaluated using an investigational hypothesis: There are no differences in means of the Walker-McConnell normative sample and the technology education student at-risk sample regarding overall social competence and school adjustment.

### Study Participants

Participants in this exploratory research project were students determined to be at-risk attending an urban high school located in the southeast region of Virginia. Testing previous evidence that technology education improves students' self-esteem and social skills (Cardon, 2000; Moye, 2011; Ritz & Moye, 2011), the researchers provided two technology education teachers with the selection criteria, based on economically disadvantaged conditions, to identify their students at-risk. Of approximately 120 students, the teachers identified 101 as at-risk. Participant demographical information for students who were determined to be at-risk can be found in Table 1.

**Table 1**  
*Technology Education Student Participant Demographics*

Gender <i>n</i> – (%)	Male	87 – (86%)
	Female	14 – (14%)
Age <i>n</i> – (%)	14 Years Old	5 – (5%)
	15 Years Old	16 – (16%)
	16 Years Old	26 – (26%)
	17 Years Old	28 – (28%)
	18 Years Old	21 – (20%)
	19 Years Old	3 – (3%)
	Not Specified	2 – (2%)
Grade <i>n</i> – (%)	9 <sup>th</sup> Grade	27 – (27%)
	10 <sup>th</sup> Grade	22 – (21%)
	11 <sup>th</sup> Grade	27 – (27%)
	12 <sup>th</sup> Grade	24 – (24%)
	Not Specified	1 – (1%)

### Instrumentation

The Adolescent Version of the Walker-McConnell Scale of Social Competence and School Adjustment, through Singular Publishing Group/Cengage Learning, was employed for the purposes of this study. The scale consists of 53 observable items that are rated (1–5 ranging from *never* to *frequently*, respectively) based on student classroom behaviors over time. Each item corresponds to a randomized subscale that is compiled after the completion of the scale. There are four subscales for the Adolescent Version of the Walker-McConnell Scale of Social Competence and School Adjustment: (a) Self Control, (b) Peer Relations, (c) School Adjustment, and (d) Empathy. The Self Control subscale consists of 13 items that reflect social maturity and developmentally appropriate behaviors exhibited (Walker & McConnell, 1995). The Peer Relations subscale focuses on humor, peer interaction, and cooperation

within its 16 items. The School Adjustment subscale includes 15 items related to work habits, organization, and promptness. The Empathy subscale consists of six items that are associated with sensitivity and sympathy. Each is identified individually, but consists of four very interrelated dimensions. Test–retest reliability, internal consistency, and interrater reliability have been established for the Walker-McConnell Scale of Social Competence and School Adjustment (Demaray, Ruffalo, Busse, Olson, McManus, & Leenthal, 1995). In addition to student performance scale items and interrelated subscales, the instrument has mean and standard deviation reporting of 1,880 adolescent ratings that serve as the normative sample for outcome comparison.

### **Methodology**

Technology education was selected as the specific educational discipline for the purpose of this exploratory study. Specifically, the applied nature of content, transferable relevance to life, and the structure that promotes social skill development through extended and consistent collaboration with peers led to the individual selection of technology education as the discipline for further exploration. Institutional and administrative approval was requested and granted to the research team for the purposes of this social competence study. Six sections of technology education students within a local education agency served as the sample. Two technology education teachers identified 101 of their students as at-risk. The teachers were provided with introductory, purpose, and instrument completion information for the Walker-McConnell Scale of Social Competence and School Adjustment (Adolescent Version). Three test profile-rating forms were completed for instrument procedure and content observation criteria. Teacher process and scale questions were addressed on an individualized basis by the researchers until there was identified comfort in conducting the item rating form and subscale identification. Once familiar with the scale, it requires approximately 10 minutes per student to complete the rating form (Walker & McConnell, 1995). At the onset of the 18<sup>th</sup> week of an 18-week course, course instructors initiated the social competence rating that factored recent course interactions and categorical behavior occurrences. The alphanumerically coded rating and subscale information was collected and entered by the social competence researchers. The coded social competence data from the two technology education sites was paired for analysis with the Walker-McConnell Scale of Societal Competence and School Adjustment 1,880-student national normative sample collected for the purposes of identifying social skill separation in individual students.

### **Data Analysis and Findings**

A two-sample *z*-test was conducted based on mean, standard deviation, and sample size of the normative sample of the Adolescent Version of the Walker-McConnell Scale and the technology education student at-risk sample. The

normative sample used to perform student comparisons and furnish diagnostic information across subscales was provided by the Walker-McConnell Scale User’s Manual (Walker & McConnell, 1995). The *z*-test permitted a normalizing statistical evaluation of the normative sample and the technology education student at-risk sample. Research Question #1—Are there differences in social competence between technology education students considered at-risk and a normative student sample?—was evaluated through the calculation of a *z*-score using the following null hypothesis: There are no differences in means of the Walker-McConnell normative sample and the technology education student at-risk sample regarding overall social competence and school adjustment. Based on analysis of the *z*-statistic and the proportional value, the null hypothesis was rejected providing evidence that there was a significant difference between a normative sample and a sample of technology education students at-risk (see Table 2).

**Table 2**  
*Normative and At-Risk Walker-McConnell*

Difference	<i>n</i> 1 Norm	<i>n</i> 2 At-Risk	Sample Mean	Std Err	<i>z</i> -Stat	<i>P</i> -value
Norm – At-Risk	1880	101	0.56	0.10	5.43	<0.0001

Additionally, the researchers conducted an itemized analysis of the Walker-McConnell Scale of Social Competence and School Adjustment profile items. These supplemental *z*-tests permitted identification of similarities and separations between technology education students at-risk and the normative group students. Although the vast majority of profile items were determined to be significantly higher for the normative group than that of the technology education at-risk group, items 15, 16, 17, 18, 22, and 23 of the 53 items were not. Table 3 (next page) identifies six of the 53 Walker-McConnell Scale items that were identified through the *z*-test as not significantly different from one another when considering students at risk and students from the normative sample.

**Table 3**  
*Normative and At-Risk Walker-McConnell Profile Items Not Significantly Different*

Item	Profile Item	n1 Norm	n2 At-risk	Sample Mean	Std Err	Z-Stat	P- Value
15	Accepts the consequences of his/her actions	1,880	101	0.17	0.11	1.62	0.10
16	Has a sense of humor	1,880	101	0.15	0.10	1.53	0.13
17	Initiates conversation(s) with peers in informal situations	1,880	101	-0.03	0.09	-0.29	0.78
18	Expresses anger appropriately	1,880	101	0.08	0.10	0.83	0.41
22	Appropriately copes with aggression from others	1,880	101	0.19	0.11	1.73	0.08
23	Responds to conventional behavior management techniques	1,880	101	0.19	0.13	1.52	0.13

Based on the normality of the predictor and independent variable paired with the visually identified linear relationships, the researchers constructed a Pearson product-moment correlation matrix in an effort to determine if there are identifiable associations among Walker-McConnell subscales for technology education students at-risk (Sheskin, 2007). This procedure enabled direct investigation of Research Question #2: Is there competence measure association between social competence subscale elements (self-control, peer relations, school adjustment, and empathy) for technology education students identified as at-risk? Based on the correlation coefficients in the matrix (Table 4, next page), there are several large identifiable associations. The largest strength of association is noted between the Self Control subscale and the Empathy subscale ( $r = 0.92$ ). Other subscale pairings, such as Peer Relations and Empathy ( $r = 0.73$ ), exhibit a positive moderate association, while Self Control and Peer Relations ( $r = 0.64$ ) and Peer Relation and School Adjustment ( $r = 0.64$ ) show medium positive strength of association.

**Table 4**  
*Pearson Product-Moment Correlation Matrix for Students At-Risk*

	Self Control	Peer Relations	School Adjustment
Peer Relations	0.64	-	-
School Adjustment	0.90	0.64	-
Empathy	0.92	0.73	0.90

#### Discussion and Conclusions

Individual technology education students' subgroup dynamic informs progressions of research while apprising technology teacher educators and classroom technology education teachers of intricate differences between students. Recognition of these differences help educators realize that classroom structure, instruction, and activities must be conducive to all learners. These research findings are important in identifying technology education social competence characteristics of students at-risk and how they differ from a normative sample of student learners.

The purpose of this study was to identify the degree of social competence for technology education students identified as at-risk. This study revealed several items of interest. First, it supports the statement made by Cardon (2000) that "technology education programs have historically attracted at-risk students" (p. 50) and that "they [technology education programs] have received little attention regarding their influence on at-risk students" (p. 50). In the context of this study, the large proportion of students considered at-risk in the six participating technology education course sections further evidences Cardon's statement. Whereas the specific data identifying the percentage of students at-risk in this particular high school were not available, it is noted that of the 120 possible students, 101 (approximately 84%) were considered at-risk.

The researchers used the Walker-McConnell Scale of Social Competence and School Adjustment (Adolescent Version) to compare 101 at-risk students to a normative sample of 1,880 students in four different scales. Again, the scale categories examined were: Self Control, Peer Relations, School Adjustment, and Empathy. There were 53 scale items that identified characteristics within each of the four scale categories. This study identified that the sample of at-risk technology education students had very identifiable social competence and school adjustment differences. Given the nature of these scale items and analyses of the results, it can be concluded that at-risk technology education students in this adolescent sample had significantly lower social competence and

school adjustment application than the normative sample of 1,880 adolescent students provided by the Walker and McConnell instrument.

This research revealed that there were only six of the 53 scale items where the participants did not have a statistically significant lower rating of social competence and school adjustment. All six of those items fell within the self-control and empathy scale categories. This observation is further supported by the strong positive correlation (highest of all factors) of the Pearson Product-Moment Correlation between self-control and empathy. These findings suggest that at-risk technology education students exhibit somewhat consistent behavior when they engage with other students, how they express themselves, how they cope with a given situation, as well as how they demonstrate sensitivity toward others. This identification highlights potential determining factors in at-risk students' election of technology education courses. This research also identifies that there is potential for technology education courses to be an avenue to further extend educational and social opportunities for students considered at-risk. Clear separations of school factors, classroom structures, and learner variables of students at-risk and normative groups enable curricula developers and practitioners to further provide for collaborative configurations that facilitate participatory and active learner approaches. Increased, but flexible, group peer interactions with specific role designations have the potential to address peer relation and empathy discrepancies in ability concerning learners at-risk while modeling peer displays of self control and adjustment.

For an undetermined reason, students identified as at-risk exhibit tendencies to engage in technology education courses. Conducting research to understand why students take these courses may be significant in finding a means to assist students in attaining potential and becoming more socially and academically successful in school and society. To date, research literature indicating factors or reasoning as to why students at-risk choose to take technology education courses is largely absent. Further study highlighting at-risk students' course selection has the potential to lead to enhanced service to this technology education subgroup, positioning the profession to aid students struggling in other areas of education and life.

### References

- Ballentine, J. H., & Spade, J. Z. (2008). *Schools and society: A sociological approach to education* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Caldarella, P., Shatzer, R. H., Gray, K. M., Young, K., & Young, E. L. (2011). The Effects of School-wide Positive Behavior Support on Middle School Climate and Student Outcomes. *Research In Middle Level Education Online*, 35(4), 1–14.

- Cardon, P. L. (2000). At risk students and technology education: A qualitative study. *Journal of Technology Studies*, 26(1), 49–57.
- Center for Occupational Research and Development. (2010). What is contextual learning? Retrieved from <http://www.cord.org/contextual-learning-definition>.
- Crawford, M. L. (2001). Teaching contextually: *Research, rationale, and techniques for improving student motivation and achievement in mathematics and science*. Waco, TX: CCI Publishing.
- Demaray, M., Ruffalo, J., Busse, R., Olson, A., McManus, S., & Leventhal, A. (1995). Social skills assessment: A comparative evaluation of six published scales. *School of Psychology Review*, 24, 618–671.
- Department of Health and Human Services. (2011). Annual update on the HHS poverty guidelines. *Federal Register*, 76(13), 3637–3638.
- Ernst, J. V., Bottomley, L. J., Parry, E. A., & Lavelle, J. P. (2011). Elementary engineering implementation and student learning outcomes. Published Proceedings of the American Society for Engineering Education Annual Conference and Exposition, Vancouver, BC, Session M544B.
- Greenburg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., & Elias, M., J. (2003). Enhanced school-based prevention and youth development through coordinated social, emotional, and academic learning. *American Psychologist*, 58(6/7), 466–474.
- Iyer, R. V., Kochenderfer-Ladd, B., Eisenberg, N., & Thompson, M. (2010). Peer victimization and effortful control: Relations to school engagement and academic achievement. *Merrill-Palmer Quarterly*, 56(3), 361–387.
- Krips, H., Lehtsaar, T., & Kukemelk, H. (2011). About the differences of teachers' self-perceptions to the statements of social competence. *US-China Education Review B*, (1b), 138–148.
- Maslow, A. H. (1970). *Motivation and personality* (3<sup>rd</sup> ed.). New York: Harper & Row.
- MacKay, T., Knott, F., & Dunlop, A. W. (2007). Developing social interaction and understanding in individuals with autism spectrum disorder: A groupwork intervention. *Journal of Intellectual & Developmental Disability*, 32, 279–290.
- McAlister, B. (2009). Teaching social/cultural impacts in technology education. In *Essential Topics for Technology Educators (CTTE Yearbook Planning Committee, Eds.)*. New York: Glencoe/McGraw-Hill.
- McCann, R. A., & Austin, S. (1988). *At-risk youth: Definitions, dimensions and relationships*. Philadelphia, PA: Research for Better Schools Inc. (ERIC Document Reproduction Service No. 307 359).
- Moye, J. J. (2008). Starting a new technology course? An opportunity to develop student technological literacy. *The Technology Teacher*, 68(2), 27–31.

- Moye, J. J. (2011). The promise of technology and engineering education. In Ritz, J. M. & Bevins, S. P. (Eds.) *The Connection to the 21<sup>st</sup> Century Workforce: Technology and Engineering Education*, 22–33, Reston: ITEEA.
- Murray, A. (2011). Montessori Elementary Philosophy Reflects Currents Motivation Theories. *Montessori Life*, 23(1), 22–33.
- Nash, J. K. (2002). Neighborhood effects on sense of school coherence and educational behavior in students at risk of school failure. *Children in Schools*, 24(2), 73–90.
- Pete, B. M., & Fogarty, R. J. (2005). *Close the achievement gap: Simple strategies that work*. Thousand Oaks, CA: Corwin Press.
- Preble, B., & Gordon, R. (2011). *Transforming school climate and learning: Beyond bullying and compliance*. Thousand Oaks, CA: Corwin Press.
- Ritz, J. M., & Moye, J. J. (2011). Using Contextualized Engineering and Technology Education to Increase Student Motivation in the Core Academics. In Barak, M. & Hacker, M. (Eds.) *Fostering Human Development through Engineering and Technology Education (ETE)*, (pp. 131–151), Rotterdam: Sense Publishers.
- Sagor, R., & Cox, J. (2004). *At-risk students: Reaching and teaching them* (2<sup>nd</sup> Ed.). Larchmont, NY: Eye On Education.
- Sheskin, D. (2007). *Handbook of parametric and nonparametric statistical procedures*. Boca Raton: Chapman & Hall/CRC.
- Stanovitch, K. E. (1986). Mathew effects in reading: Same consequences of individual differences in acquisition of literacy. *Reading Research Quarterly*, 21(4), 360–406.
- Threeton, M. D. (2007). The Carl D. Perkins career and technical education (CTE) act of 2006 and the roles and responsibilities of CTE teachers and faculty members. *Journal of Industrial Teacher Education*, 44(1), 66–82.
- Tomlinson, C. A. (2003). *Fulfilling the promise of the differentiated classroom: Strategies and tools for responsive teaching*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Walker, H. M. & McConnell, S. R. (1995). *Walker-McConnell Scale of Social Competence and School Adjustment*. San Diego, CA: Singular Publishing Group, Inc.