TEAMWORK EVALUATION BY MIDDLE GRADE STUDENTS IN INCLUSIVE CLASSROOMS

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Teamwork skills are considered essential in a work environment characterized by diversity and interdependence. Consequently, middle grade teachers arrange cooperative learning so students can acquire experience with solving problems in groups. Teachers also acknowledge that they are frustrated because appropriate instruments are lacking to track student progress and detect learning needs within the social context. A resulting question is: How can teamwork skills and deficits of students be more accurately detected and fairly reported? This presentation describes an instrument to synchronize how teamwork is assessed in classrooms with the way teamwork is evaluated at the workplace. The Teamwork Skills Inventory relies on peer observation and self-evaluation to establish student accountability, acknowledge competencies, and identify learning needs of individuals, teams, and classes. Middle grade students (N = 297) including 39 in special education were administered the Teamwork Skills Inventory after 4 weeks of cooperation in inclusive teams. The peer and self-evaluation ratings of general education students and special education students were compared to determine teamwork skills and deficits for both groups. Results showed special education students rated themselves as demonstrating more teamwork skills than were observed by their general education teammates. Both groups rated the general education students as demonstrating the most teamwork skills. Considerations for improving teamwork skills are recommended to general education teachers, special education teachers, middle grade students, and parents.

Students should learn the skills they will be expected to demonstrate as adults. Some of the competencies that may be required in the future remain unknown but there is agreement that performing well in teams is essential in an interdependent workplace (Gupta, 2011; Tapscott & Williams, 2012). Going beyond the traditional emphasis on student competition to also assign priority to teamwork skills is a daunting challenge for the public schools. Middle grade teachers have responded with cooperative learning opportunities for students

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to solve problems in groups (Gillies, 2007). This practice reflects a change from thinking of teachers as the single source of learning to the broader view in which students are also seen as sources of knowledge for peers.

Understanding the workplace that students must be prepared for reveals suitable methods of evaluation they should practice in school. Over the past decade nearly all of the Fortune 500 companies gave up reliance on hierarchical personnel evaluation, typically judging employees by a supervisor, in favor of multirater peer performance reviews (Lepsinger & Lucia, 2009). The most common multirater approach is 360-degree feedback and corresponds to operation of a compass. A circular compass is a navigation tool that has 360 points of reference to identify direction and monitor whether a compass reader is on or off course. The 360-degree feedback model includes perceptions of individual performance from multiple sources of observation. There may be differences in how people see themselves and the way they are seen by others. Reliance on multiple observers increases the reliability and can detect poor performance and achievement with greater accuracy. Employees prefer multirater evaluations because their coworkers observe them often, recognize how well they fulfill responsibilities, and can identify their shortcomings. Management also favors team assessment because this strategy has been found to improve productivity (Gupta, 2011; Klaus, 2008).

By synchronizing teamwork evaluation in school with teamwork evaluation on the job, there can be greater transfer of training. Three conditions for school evaluation are similar to conditions at work. First, the emphasis is on how each individual contributes to a team effort. When this condition is applied to evaluation of how students contribute to learning of teammates, it means individuals are responsible for their own conduct but cannot be held accountable for the behavior of teammates. Motivation to cooperate increases as students recognize that they will be evaluated based on teamwork skill criteria their peers observe them demonstrate. When students become aware of the importance employers attach to teamwork, they usually add cooperative skills to their definition of what it will take to succeed (Levi, 2007).

Second, students should share some responsibility for evaluation of learning in teams. Educators acknowledge that evaluation of teamwork is confusing (Johnson, Penny, & Gordon, 2009). The task is logistically difficult because teachers cannot be present to witness interaction of every cooperative group nor intuit how individuals influence others. Students also express discontent with evaluation of teamwork because they have no input (Robinson, 2011). Educators are subject matter specialists and therefore the best qualified to judge work products submitted by student teams. In contrast, adolescents are the best source to identify classmates that influence them and describe help from peers. Evaluation by team members can free teachers from reliance on personal observations as a sole basis for decision making about the progress of individuals. Instead, teachers can focus attention on their facilitator role while students get to report their more reliable observations based upon greater experience within the group (Hansen, 2009).

Third, self-evaluation should be compared with observations of peers. Students take national tests, state tests, and teacher tests. Feedback on these measures is beneficial. In addition, students can benefit from peer feedback on teamwork performance (Klaus, 2008). Cooperative learning offers ideal conditions for comparing self-evaluation with peer observations. Critical self-evaluation enables someone to realize when to think well of self and when behavior should change based on observations of others. In the middle grades students acquire the capacity to introspect, to apply self-examination to feelings, thoughts, and motives (Goleman, 2006).

During early adolescence it is usual to form cliques composed of peers that share similar interests. This practice can lead to exclusion of classmates, most often those with disabilities.

For a long time the disabled were segregated in school. Fortunately, improvements have been made based on the realization that individuals with disabilities are neither helpless nor hopeless but require some assistance to develop their talent. This view is reflected by federal government regulations for employment, access to buildings, and provision of education. Teachers, parents, employers, and the disabled share the expectation that disabled students can become productive citizens. The transformation from potential to achievement occurs as general education teachers and special education teachers collaborate, families and schools unite, and instruction facilitates integration (Strom, Strom, Wingate, Kraska, & Beckert, 2012).

The stimulus for reform came from a revelation that over a million students were being excluded from public schools (Osgood, 2007). Mainstreaming refers to the placement of special education students in regular classes, a practice that began after Congress passed the Education for All Handicapped Children Act in 1975. The traditional duration for school laws was waived because this reform is intended to govern education policies permanently. The latest amendment to the law, in 2004, is called Individuals with Disabilities Education Act (IDEA).This revision requires inclusion of special education students in all aspects including extracurricular activities. The six million students classified as in special education represent 10-12% of the public school population and 70% of them attend regular classrooms (Farrell, 2012).

Most people will eventually face disabilities in their family or at work. It can be predicted that a certain proportion of all students will eventually suffer impairments or disabilities, whether by accidents, illnesses, or age. Further, some will grow up to become parents of disabled children or employers of impaired workers (Smart, 2011). These reasons underscore why the acceptance of differences has become an important aspect of schooling communicated to students by their curriculum and implemented during class by cooperative learning.

During the primary grades students are expected to work independently most of the time. However, when boys and girls reach the middle grades they become more concerned about how peers think and feel. Students want to interact with one another so cooperative learning has great appeal for them. The way teachers establish interdependence is by structuring complex tasks that can only be achieved when students rely on teamwork for collaboration. Cooperative learning is intended to promote social connections among students from different backgrounds, encourage development of constructive norms, present opportunities to practice teamwork, and motivate the view that problems can usually be solved by collective action (Mastropiera & Scruggs, 2009). In this kind of setting student teams become more like teams at the workplace because the teachers share responsibility for evaluation of group learning. This transition requires teachers to trust students to gain experience in making judgments and reporting perceptions in an authentic way.

Studies of classrooms have found that when student-engaged instruction is emphasized, greater academic achievement occurs than when the emphasis is on teacher-directed instruction and students have a passive role (Gargiulo & Metcalf, 2012). General education teachers support inclusion most when they remain aware of the high cost of social segregation, build relationships with special educators, and arrange cooperative conditions that promote interaction and prevent social exclusion. Inclusion also depends on the development of mutual respect between disabled students and general education students as they plan and solve problems together. Cooperative inclusion groups improve the behavior management of special education students (Gore, 2010). In addition, teachers report that special education students experience greater self-esteem, seem less frustrated, and listen more carefully to peers (Rubin, Bukowski, & Laursen, 2011).

The Russian psychologist Lev Vygotsky (1978) warned that the most influential learning for people with disabilities is the social consequence of their rejection by others who would not behave that way in a more humane society. This perception is widely shared and reflected by teacher efforts in inclusive classrooms to facilitate productive interaction between the general education students, those not diagnosed with a disability, and special education students. This contact is expected to motivate general education students to become more accepting of peers with disabilities and more willing to support their achievement and mental health. Cooperative learning is also intended to provide opportunities for special education students to observe and adopt social skills modeled by general education students in inclusive teams (Farrell, 2012).

Teacher observation in the primary grades is the basis for estimating progress of special education students in learning teamwork skills. When teachers are able to detect learning needs, an Individualized Education Plan is prepared that includes appropriate intervention. Later, as students advance to the middle grades, cooperative learning is a common strategy and enables classmates to become a source of observation for teamwork skills that are demonstrated by peers (Johnson, Penny, & Gordon, 2009). The study reported here sought to examine special education and general education inclusion teams. The diagnostic purpose was to find out how each group evaluated performance of teammates and their own behavior. The three research questions were:

1. How do special education students evaluate themselves on teamwork skills as compared to how general education teammates evaluate the special education students?
2. How do special education students evaluate general education teammates as compared to how general education teammates evaluate themselves?
3. How do special education students evaluate themselves as compared to how the general education teammates evaluate themselves?

METHOD

Research Design

The investigation applied a quantitative posttest design. Students were randomly placed in teams, and self-administered the Teamwork Skills Inventory after 4 weeks of collaboration. This minimized violation of independence of data and allowed for use of independent measures. Nonparametric statistics were applied because data collected may not have been representative of the national population. Research questions were answered by responses of the cooperative learning groups that included a special education student. Spearman rank correlations detected response differences between general education and special education groups. The diagnostic analysis examined self-reported competencies by two student groups in comparison with peer observations of them to detect instructional implications. Each of 25 teamwork competencies is scored as a *yes* or *no* response to reflect whether an individual consistently demonstrated each of the skills. Descriptive statistics compared the number of *yes* responses by special education students and general education teammates.

Participant Selection and Characteristics

The subjects consisted of 297 boys (52%) and girls (48%) in Grades 5 through 8 from a middle school or junior high in a metropolitan center of the southern United States. These 10- to 14-year-old students identified themselves as White (49%), Hispanic (40%), Black (4%), or other (7%). Participants included 39 special education students, 13% of the sample, roughly the same proportion enrolled in special education across the nation. The special education students (41% girls, 59% boys) spent 50% or more of the day in an inclusion

classroom. Twenty-five of the 39 were classified as having a specific learning disability. The remainder 14 students were classified as emotionally disturbed, attention deficit disorder, or other health impairment.

Principals from six middle school and junior high schools identified 19 teachers who led inclusion-based classrooms. All students in the classes of these teachers were randomly assigned to four or five member teams. Special education students were placed first in order to prevent having more than one of them on an inclusive team. Only the inclusive teams were used for data analysis. A total of 70 teams were established so that every student from the selected classrooms could participate in project activities. Teams were assigned problem solving tasks over a 4-week period.

Instrumentation to Evaluate Teamwork Skills

The Teamwork Skills Inventory is intended to provide guided practice for peer and self-evaluation of performance in cooperative learning groups (Strom & Strom, 2011). The instrument purposes are to: (a) identify teamwork skills that are consistently demonstrated by individuals, (b) provide a profile of anonymous feedback from observer teammates, (c) compare teammate observation of performance with self-impression of performance, (d) detect the skill deficits of individuals and groups to guide instruction, (e) credit conscientious teammates for contributions, (f) reveal slackers that fail to do their fair share of group work, and (g) yield an easily understood record of teamwork skills for placement in student portfolios.

The evaluation process begins as each cooperative learning group gives a name to their team such as Virtual World Travelers. Then the teacher enters the names of teams in a class and membership for each team on a setup page. Each student is provided a school code and random individual password for login. When students enter their team page, names of all members are displayed and they select one teammate. The 25 items appear for evaluation of this student. The evaluator is directed to check only items the teammate demonstrated in a consistent way. There is a place to click beside each of the skills. If an evaluator is uncertain about the meaning of any criterion, s/he clicks the item and a definition of the skill appears in a pop-up box.

After a student finishes evaluation of one teammate, responses are submitted and another teammate is chosen. When any member, including the evaluator, is credited with demonstrating 20 or more skills, a pop-up presents this comment, “Are you sure? This is a very high rating.” Based on this gentle reminder, a student can submit the same ratings anyway or pause to reflect and reconsider some ratings. Following the deadline date that a teacher assigns for completing evaluations, students logon to print their individual profile. The profile presents the proportion of teammates that confirmed each of the 25 behaviors was demonstrated consistently along with a parallel record of self-impression regarding each of the items.

Certain conditions should be met before administering the Teamwork Skills Inventory. Groups should work together long enough to support the reliability of their observations. The minimal time together is 4 weeks prior to formative assessment and a similar duration between formative and summative evaluation. The interdependence and cohesion needed usually requires continuity of membership and an adequate investment of time spent together.

Another condition is exposure to five orientation lessons that acquaint the students with criteria for teamwork success, behaviors expected of all members, and responses to ensure fair and accurate appraisal. The five lessons, requiring a total of 100 minutes, describe the rationale for multirater peer performance reviews in the workplace. Students discuss the teamwork skills criteria, consider the benefits of authentic reporting, and recognize obstacles that must be overcome to minimize flawed assessment of peer and self-performance.

Theoretical Base for Instrument Scales and Items

The 25 items included in the Teamwork Skills Inventory are based on research literature about cooperative learning, small group dynamics, creative and critical thinking, and employee evaluation practices in business and industry (Drucker, 2008; Kim, 2011; Moore & Parker, 2008; Myers & Anderson, 2008; Roseth, Johnson, & Johnson, 2008; Runco, 2006; Tapscott & Williams, 2012; Torrance, 2000). Items appear in conceptually convenient clusters of five skills for the observers to indicate whether a student: (1) attends to teamwork, (2) seeks and shares information, (3) communicates with teammates, (4) thinks critically and creatively, and (5) gets along with teammates. A synthesis of research implicating each of the clusters is presented.

Attends to teamwork (Items 1-5). The five items contained within this cluster implicate acceptable attendance at team meetings, arriving on time for meetings, staying focused on team tasks, fulfilling individual roles, and doing a fair share of the work that is expected of everyone.

People with a record of absences on the job and arriving late for work are the most likely to be fired. A Pew Foundation national survey of 2,000 adults asked them what it would take for young workers to succeed (Taylor, 2012). The factor most frequently identified was a good work ethic, chosen by 61% of respondents, followed by knowing how to get along with coworkers at 57%. Being physically present is not a guarantee that a person can be relied on to perform tasks assigned by their team (Hofstede, Hofstede, & Minkov, 2010).

Life is frequently set off course by distractions making it difficult to devote full attention. Paying attention and concentrating are states of mind that seem to be in decline. Some obstacles include the attraction of multitasking and insistence on staying in constant touch with others, always being connected to avoid the possibility of missing anything. Adoption of this mindset motivates incessant checking for messages and sending texts (Jackson, 2009). Neuroscience experiments have found that multitasking interferes with information processing, diminishes concentration, and reduces comprehension. These signs of distractions undermine student ability to listen carefully and to recognize relevant aspects of the conversation with their team (Foerde, Knowlton, & Poldrack, 2006). Other observers warn that the essential capacity of attention is in danger because a distracted lifestyle is shrinking people's ability to engage in deep and sustained concentration that serves as building blocks for wisdom, progress, and intimacy (Carr, 2010). Reliance on technology makes distraction a ubiquitous experience.

In testimony before the British House of Lords, neurologist Susan Greenfield (2008) of Oxford University shared her investigations revealing that many children seem to be losing the normal ability needed to concentrate and stay attentive in class. Experienced teachers from all grade levels report they have observed this trend (Meltzer, 2007). In the past students were able to stay seated, pay attention longer, and were less easily distracted (Bodrova & Leong, 2006). Students can focus but try to focus on everything at once. They want to see and hear all that is happening, even things that should be blocked out to enhance learning but are not because the students are accustomed to simultaneously monitoring multiple events (Carr, 2010).

Gloria Mark, professor at the University of California, is a specialist in the study of effects of disruption on job performance. Business surveys conducted by Mark, Voida, and Cardello (2012) have found that, on a typical workday, office personnel change tasks on average every 3 minutes. E-mail, instant messaging, texting, phone inquiries, and questions from the coworkers nearby present a stream of continual interruptions. Once interrupted, it usually takes 25 minutes to return to the original task.

Michael Posner, professor at Cornell University Medical College is a recognized expert on information processing. He believes that

Americans are building a culture that prizes frenetic movement, fragmented work, and instant answers. Ultimately, the new world does more than just speed life up. Environments that emphasize only the present time can restrict focus, awareness, planning, and judgment that comprise attention. When focus is split, awareness is minimal, the ability to gain perspective is compromised, and critical thinking ability is reduced along with participation in deep learning for creativity (Posner & Rothbart, 2006).

Seeks and shares information (Items 6-10). Five items of this cluster include admitting when in doubt about what should be done, asking questions to improve group understanding, helping peers by explaining or reviewing lessons, bringing reading materials for the team to examine, and referring to reading materials during team discussions.

Adolescents prefer to work in teams and recognize that cooperative learning can be an asset for their future (Goleman, 2011). They know the benefits of sharing recommendations with their social network about Web sites to visit, checking with friends on homework, providing encouragement when classmates are upset, and sharing obligations to perform tasks while giving feedback and providing tutorial assistance to one another.

Student readiness to collaborate can increase with awareness of how business is being impacted by teamwork. For example, Boeing Aircraft credited training on interdependence and teamwork skills for a 50% decrease in engineering problems on the large 777 jets that seat 300 passengers. Similarly, Federal Express reported a 40% increase in productivity after employees were oriented to how team structures foster greater productivity (Gladwell, 2008).

Benefit also comes from knowing how collaboration on a global scale has become a force for innovation. At Proctor and Gamble in Cincinnati, Ohio, one of the world's largest companies, management concluded that even with their 7,500 research employees, they would be unable to sustain a lead over competitors. Instead of hiring more researchers, unit leaders were directed to obtain 50% of new product and service ideas from outside the company. As a result, someone can work for Proctor and Gamble without being on the payroll. Potential contributors register at InnoCentive network where 90,000 scientists make themselves available to solve difficult research and development problems. The reward for submitting an acceptable solution can range from several thousand dollars to over a million dollars when provided by the posted deadline (Lesser, Ransom, Shah, & Pulver, 2012). InnoCentive is just one of a number of marketplaces to match scientists with research and development challenges at businesses seeking to innovate. Proctor and Gamble, Dow, DuPont, Novartis, Honeywell, and other major companies rely on these sources for novel ideas, inventions, and qualified minds to help them unlock new values in markets. This vast scope of collaboration is expected to replace traditional hierarchies within corporations that have been the main engines of wealth creation.

Communicates with teammates (Items 11-15). The five items of this cluster focus on sharing experiences, feelings, ideas, or opinions, speaking clearly and using easily understood vocabulary, limiting length of comments so that others get to talk, listening to everyone and respecting their views, and encouraging and recognizing contributions of others.

The message from Warren Bennis and Patricia Biederman (1998) in *Organizing Genius: The Secrets of Creative Collaboration* is, "None of us is as smart as all of us." They describe how networks of talented people have changed the world and methods that they relied on to transform themselves from independent achievers to collaborative, productive teams. The chronicled groups include those with an enduring impact like Palo Alto Research Center at Xerox and Apple that were the first to make computers easy to use and widely accessible for nonexperts; aeronautical engineers that built radically new aircraft for Lockheed; scientists that worked on the Manhattan Project at Los Alamos to hasten conclu-

sion of World War II; and entertainment visionaries responsible for the appeal of Walt Disney Studios. These groups illustrate lessons of value about how teams can become great if individuals are united in purpose and given freedom to do their best.

Most guidelines for academic success were formulated in the past when the pursuit of excellence was defined mostly in terms of individuality, independence, autonomy, self-reliance, being and making it on your own. These attributes will continue to remain important but their relevance can no longer be an adequate design for influence or group productivity. The quest for independence has to be linked with equal appreciation for interdependence that is demonstrated by communicating perspectives with teammates. Helping employees to value and pursue goals that go beyond individual identity is seen as an enormous challenge for business (Gupta, 2011).

Thinks critically and creatively (Items 16-20). The five items that make up this cluster relate to considering views that differ from personal opinion, using logic to challenge group thinking or work methods, thinking carefully about ideas before reaching conclusions, building on the ideas of others, and offering new ways of looking at problems or events.

Encouragement for creative thinking has typically centered on extraordinary individuals. This support must expand because companies place greater reliance on the critical and creative thinking that takes place in teams (Moore & Parker, 2008; Myers & Anderson, 2008). This means creativity will increasingly have to be achieved within a social group context (Hansen, 2009). Acceptance of divergent thinking must become more common in teams so the ideas of creative persons are given fair consideration (Robinson, 2011). Creative individuals must realize that critics will initially express doubts about the worth of their ideas. They may be criticized for advancing novel views, taking a stand, refusing to compromise principles, sharing their faith, raising questions of authority figures or seeing new ways of doing things. Creative people need courage to make their contributions and avoid the expectation of immediate approval from others (Runco, 2006; Torrance, 2000).

A decline in creativity is prompting widespread concern by employers, politicians, and educators (Robinson, 2011). The Flynn effect indicated that IQ test scores significantly increased worldwide from one generation to the next over the past century (Flynn, 2012). Kyung Kim, an educational psychologist at the College of William and Mary, was curious to learn whether there was a similar trend in creativity scores. Kim (2011) conducted a meta-analysis of 300,000 child and adult responses to the *Torrance Tests of Creative Thinking* (Torrance, 1998). Results showed that creativity scores had steadily risen in a corresponding way as IQ scores but the progression ended in 1990. Over the past 2 decades creativity scores have declined and the greatest losses involve children in kindergarten through sixth grade.

These outcomes are worrisome, particularly when contrasted with results of an IBM poll completed by 1,500 chief executive officers of major companies. They identified creativity as the most important leadership competency needed for the future (Tapscott & Williams, 2012). This impression is shared by Pasi Sahlberg, director general of the Center for Mobility and Cooperation in Helsinki. Finland has ranked first in student achievement for a decade compared to 31 nations including the United States. Schools in Finland encourage student risk-taking, creativity, and innovation. In his book *Finnish Lessons*, Sahlberg (2011) asserts, “If creativity is defined as coming up with original ideas that have value, then creativity should be as important as literacy and treated with the same status” (p. 143).

Gets along with teammates (Items 21-25). The five items in this cluster are focused on willingness to accept criticism, avoid blaming others for problems, accept compromise as a way to handle conflict, keep trying when a task is difficult, and express hope about group success.

Cooperative learning has been a focus of many investigations to determine how social relationships impact student behavior and achievement. Roseth et al. (2008) conducted a meta-analysis of 148 studies to compare the relative effectiveness of cooperative, competitive, and individualistic goal structures. Participants included 17,000 adolescents, ages 12 to 15, from 11 nations. As predicted by social interdependence theory, the students from classrooms with cooperative learning goals where teams collaborated were more accurate in test outcomes and earned higher problem-solving scores for reasoning and critical thinking tasks compared to classes where the main emphasis was on competitive or individualistic learning. In cooperative settings, students expressed a greater sense of peer connection and support. Some implications noted were that when teachers structure classes in a cooperative manner, academic achievement and social development goals can be promoted simultaneously while student goals for interaction are also met.

Getting along with teammates is a fundamental attribute for working in groups. Jean Twenge, professor of psychology at San Diego State University, compared personality test results of the baby boomer generation (born 1946-1964) when they were under age 30 with students of the millennial generation (born since 1980). Twenge's findings, based on responses of 16,000 students, are discussed in *The Narcissism Epidemic: Living in the Age of Entitlement* (Twenge & Campbell, 2010). Two thirds of the millennials agreed that their generation is more self-centered and narcissistic. According to Twenge, this hyperindividualistic orientation is a result of fostering self-esteem for students independent of behavior or achievement, constantly telling children they are special and protecting them from recognizing their failures, thereby preventing the resilience that is needed to recover and persevere following setbacks.

Anyone who supposes that s/he always performs well is unlikely to seek or to consider external criticism. Few students learn to process constructive suggestions for improvement from teammates in their cooperative learning groups. Consequently, defensiveness is recognized as a common liability that restricts growth because many people rely on themselves alone to detect personal shortcomings and learning needs (Drucker, 2008; Dunning, 2005).

Psychometrics of the Teamwork Skills Inventory

Prior to the inclusion study, a field test of the Teamwork Skills Inventory was conducted at a secondary school where the faculty of 120 teachers had all been trained by their district to implement cooperative learning in each course of the curriculum (Strom & Strom, 2011). Every teacher volunteered to participate in the study. Ten teachers, representing the complete range of curriculum subjects, and 300 of their students were selected. These teachers served as the expert sources of judgment about content validity. All ten teachers reported that the cooperative skills expected of students for acceptable performance in their classes are contained and well defined by the 25 items of the inventory.

The usual procedure to check empirical validity of a new instrument is correlation with an existing measure of the same function. However, no other teamwork skill instruments were found that provided reports of psychometric indicators. Therefore, empirical validity had to be determined by the more stringent method of comparing student-expressed behaviors with student-observed behaviors. Self (n = 303) and peer (n = 1,136) reports were compared to determine levels of agreement for each of the 25 skills.

In order to rely on self and peer judgments as predictors, agreement levels between the two sources must exceed 50%. When agreement levels reach 70%, it can safely be concluded that specific teamwork skills have been demonstrated (Furr & Bacharach, 2007). Agreement levels were high, ranging from 87% to 97%. The agreement between student

self-reports and peer observations was at least 90% for 23 of the 25 items. These outcomes suggest that, when students are carefully oriented to the rationale and methods of the Teamwork Skills Inventory, they can be trusted to report perceptions on peer and self-fulfillment of skills. This conclusion was corroborated by a separate survey showing that 90% of teachers and 86% of the students participating in the field test felt comfortable about overall truthfulness of student assessment.

Internal consistency was found using team scoring forms. Cronbach's alpha coefficient method provided a floor estimate for reliability of peer and self scores on the overall measure. The 25 skills total scale alpha coefficient for 303 self-reports was 0.79. Total scale alpha for the 1,136 peer observations was 0.87. Alpha for combined 303 self-reports and 1,136 peer responses (N = 1,439) was 0.86. These estimates are within the good range for group analysis. In contrast, the prevailing practice in schools is to rely on the observations of one teacher who may not be present most of the time when students interact in groups. Observational reliability increases as the number of observers grows. This is the case in cooperative learning groups where students are the only observers who are continually present.

RESULTS

Special Education Students

Table 1 shows the proportion of positive self-evaluations by special education students in inclusion teams for each item compared with the observations of them by their general education teammates. Similarly, self-evaluations of general education students were compared with the observations provided by the special education teammates. A majority of special education students and the general education students who observed them reported special education students consistently demonstrated 15 teamwork skills during group activities.

The learning needs of special education students are also detected in Table 1. Less than half the general education students observed ten teamwork skills as consistently demonstrated during group work. Overall, special education students assigned themselves higher scores than they were given by the general education students on 24 of the 25 items. Spearman rank order correlations between groups found significantly different responses on 13 items indicated by asterisks in Table 1.

General Education Students

Table 1 shows the proportion of positive self-evaluations by general education students compared with observations of them by special education students. A majority of the general education students and special education observers credited the general education students as consistently demonstrating 22 of 25 teamwork skills. Three skills were not demonstrated consistently in the estimate of both groups. Special education students gave the general education students higher ratings on nine items than general education students gave themselves. Spearman correlations indicated that responses of special education and general education students were significantly different on five items as shown by asterisks in Table 1.

Limitations of the Study

Thirteen percent of the subjects were in special education, a proportion that approximates their representation in schools throughout the nation. The Individuals with Disabilities Education Act of 2004 acknowledges there is wide variance within special education. Logistical restrictions prevented inclusion of all special education categories in this exploratory study. Accordingly, the results apply only to the special education and general education participants. Data gathering will continue for cross-validation of the inventory in conjunction with confirmatory factor analysis. Students completed the instrument only once as formative

TABLE 1
Percentage of Positive Answers for Self and Peer Evaluation of Teamwork Skills
by Special Education Students and General Education Students Working in Inclusive Classrooms

	Special Education Students		*General Education Students*	
Teamwork Skills Items	*% Self*[a]	*% General*[b] *Peers*	*% Self*[b]	*% Special Ed*[a] *Peers*
1 Acceptable attendance	82.1	77.4	94.0	79.0***
2 On time for meetings	92.3	78.2**	94.9	83.1**
3 Focuses on team task	59.0	43.5	76.1	65.3
4 Fulfills individual role	69.2	45.2**	75.2	67.7
5 Does fair share of work	82.1	56.5***	87.2	81.5
6 Admits uncertainty	64.1	67.7	63.2	70.2
7 Asks procedure questions	69.2	47.6**	63.2	64.5
8 Explains lesson concepts	64.1	30.6***	53.8	55.6
9 Brings readings to share	43.6	26.6	35.9	44.4
10 Refers to readings	46.2	25.8	41.9	51.6
11 Expresses feelings, ideas	66.7	64.5	76.1	71.0
12 Speaks clearly	79.5	76.6	85.5	73.4*
13 Limits comment length	64.1	61.3	68.4	64.5
14 Listens and respects others	82.1	62.1***	77.8	78.2
15 Encourages teammates	66.7	41.9**	68.4	62.1
16 Considers divergent views	71.8	55.6**	72.6	67.7
17 Uses logic to challenge	53.8	39.0	42.7	52.4
18 Applies reflective thinking	64.1	51.6	63.2	64.5
19 Builds on ideas of others	56.4	55.6	73.5	58.9*
20 Offers new perspectives	56.4	41.1	55.6	60.5
21 Takes suggestions well	69.2	49.2**	72.6	67.7
22 Avoids blaming others	74.4	55.6**	75.2	60.5**
23 Accepts compromise	71.8	54.8**	62.4	66.1
24 Keeps on trying	84.6	57.3***	76.9	79.8
25 Shows hope for success	76.9	59.7***	74.4	70.2

Note: Adapted from *Teamwork Skills Inventory,* Copyright © 2012 by P. Strom & R. Strom.
[a]$n = 39$. [b]$n = 195$.
*$p < .05$. **$p < .01$. *** $p < .001$.

evaluation; a summative evaluation was not conducted.

DISCUSSION

Special Education Teachers

Educators should acknowledge that an Individualized Education Plan might not identify some important conditions that influence effectiveness of inclusion practices. This is because teachers cannot know firsthand if special education students demonstrate teamwork skills while they work in inclusion teams and if general education students model teamwork skills for adoption by special education students. Faculty should be able to detect and remediate skills in which the special education students lag behind general education classmates. Current knowledge regarding team-

work skills of special education students is limited to observations from educators but not students. By compiling Teamwork Skills Inventory group profiles for students that are learning disabled, attention deficit/hyperactivity disordered, and individuals having other special needs, educators can better gauge how programs predicated on support of peer relationships are succeeding in the estimate of special education and general education students.

The strengths of special education students should be acknowledged and reinforced. Self-assessments by a majority of special education students as well as the general education students observing them identified the following assets. This peer: shows acceptable attendance for team meetings (Item 1); arrives on time for team meetings (Item 2); does a fair share of the work expected of everyone (Item 5); admits uncertainty when in doubt about what to do (Item 6); shares experiences, feelings, ideas, and opinions (Item 11); speaks clearly and uses easily understood vocabulary (Item 12); limits length of comments so others get to talk (Item 13); listens to everyone and respects his or her views (Item 14); considers views different from his or her opinions (Item 16); thinks carefully about ideas before reaching conclusions (Item 18); builds on the ideas of others (Item 19); avoids put-downs or blaming others for problems (Item 22); accepts compromise as a way to deal with conflict (Item 23); keeps trying even when the task becomes hard (Item 24); and expresses hope about group success (Item 25).

Student learning needs should also be considered by teachers. Less than half of general education students observed special education students consistently demonstrate the following ten skills. This peer: focuses on team task (Item 3); fulfills individual role (Item 4); asks questions that help the group understand lessons (Item 7); helps by explaining or reviewing lessons (Item 8); brings reading materials for the group to examine (Item 9); refers to reading materials in discussions (Item 10); encourages and recognizes contributions of others (Item 15); uses logic to challenge group thinking or work methods (Item 17); offers new ways of looking at ideas or problems (Item 20); and takes suggestions for improvement in a friendly way (Item 21).

Special education students identified the following items in their lowest quartile for self performance: This peer: focuses on team tasks (Item 3); brings reading materials for a group to examine (Item 9); refers to reading materials in discussions (Item 10); uses logic to challenge group thinking or work methods (Item 17) builds on ideas of others (Item 19); and offers new ways of looking at ideas or problems (Item 20).

General Education Teachers

Effective team participation requires accurate self-assessment, an uncommon asset in a society where self-impression is typically inflated (Dunning, 2005). Accuracy can become more common when students are trusted to practice processing anonymous feedback from peers. Using reasonable criteria for self-evaluation and becoming self-critical contributes to maturity. In addition to accurate evaluation of personal behavior, students need to be competent in helping teammates know their strengths and learning needs.

Evaluation of individual and group progress in team skills should include observers other than teachers because educators cannot be present to witness social interaction of all cooperative groups nor interpret how students influence one another. Instead, teachers should orient students to share some responsibility for appraisal. Teachers that recognize teammates as the most reliable source of observation on group interaction convey trust and respect for perceptions of students. Reliance on student observations can improve teacher awareness about individual, group, and class skills and recognize achievement, gauge progress, and develop appropriate intervention.

The general education and special education students recorded their lowest scores on the same two items: This peer: brings reading materials for the group to examine (Item 9)

and, refers to reading materials during discussions (Item 10). When teachers maximize the conditions for sharing, both deficits can be overcome. During data gathering students expressed a preference for self-directed learning but, even when informed what the topic for discussion would be the next day, they did not bring reading material to class because the teacher had not made it part of their assignment. When students go online and search, read articles or news reports, the independent learning can be shared when teachers schedule time in class for reporting to teammates. This peer teaching increases group knowledge and confirms the value of data sharing. After teammates share with each other what they have independently learned, the written homework can be submitted to the teacher. In this way everyone learns more, conscientious students are recognized, slackers are more readily detected, and benefits of interdependence are confirmed.

Linking independent learning and social interdependence requires practice. Self-directed learners accept responsibility to be a source of knowledge for peers. Helping students enlarge their commitment from independence to also include appreciation for interdependence can be difficult. This shift is especially demanding for students nurtured to celebrate recognition of the individual, and suppose 'It's all about me'. Immersion in social network friendships can render some students incapable in the beginning to carry out authentic peer and self-evaluation that is expected of teams at work (Twenge & Campbell, 2010).

Students

Regular and special education students should understand the purpose of peer and self-evaluation applies to future employment. They need to seriously consider feedback from peers about team performance. Although someone might believe s/he demonstrated a specific skill, if the skill is not demonstrated in a consistent manner, teammates are unlikely to identify it as an asset. Students should also realize the importance of showing their parents the feedback that has been provided by peers about teamwork assets and deficits. Parents usually have many years of experience on the job so they can be a valuable source of advice on teamwork.

Getting honest feedback from peers is essential to provide suitable direction for growth and to support confidence. Students of all ages require help to recognize the merits of authentic reporting and implications for their future at work. The five-lesson curriculum for students is an important aspect of their orientation. Teachers should not be discouraged when students initially engage in gratuitous peer evaluation involving friends and underestimating assets of peers they may dislike. Students should be seen as capable of learning to provide authentic reports and are likely to do so when teachers are patient and help them establish appropriate expectations.

Parents

Forty-nine percent of special education students and 45% of general education students reported spending five or more hours a week doing things with their parents. Many families are unable to teach academic subjects offered in middle school and junior high but can provide life lessons about getting along with teammates. The acquisition of teamwork skills, more than other aspects of curriculum, should include a teaching role for parents (Grove & Fisher, 1999).

Keeping records of teamwork skills is a practical way to maintain parent involvement in the education of adolescents. Some parents excuse themselves from having a guidance function by claiming that teenagers should learn how to manage their own affairs and be independent. Other parents believe that when students get to middle school it is impossible to relate to all of their child's teachers. However, regardless of their occupation, parents recognize that teamwork skills are needed at work and at home. Therefore, orienting parents to teamwork skills expected in the classroom can

enable faculty and family to cooperate in teaching and reinforcing skills in both environments. Because parents have to assist children for many years, teamwork skill records can help them monitor progress.

Parents and teachers are sometimes defensive when they talk about a student. However, in discussions about Teamwork Skills Profile results, neither of the adults is inclined to blame the other for inaccurate perceptions. It is not a matter of whether parent or teacher has the better perspective. Instead, they are both obligated to examine the self-impressions of one adolescent and how teammates perceive that individual. In this situation, teachers and parents are more motivated to unite their efforts to help the student reconcile disparities between observations of peers who observe them and their self-impressions.

Teamwork requires accurate self-assessment that will become more common if students are trusted to practice giving and receiving anonymous peer feedback. Having reasonable criteria for self-evaluation and becoming self-critical contribute to personal development. In addition to learning to accurately evaluate their own behavior, students should gain competence in helping teammates become aware of their assets and learning needs by sharing an obligation for appraisal of teamwork. Teachers who acknowledge teammates are the most reliable source of observation about what occurs in groups communicate trust and respect for students. Reliance upon student perceptions can inform teachers about skills demonstrated by individuals, groups, and classes and serve as a basis for recognizing achievement, gauging progress, and developing intervention.

Teamwork skills and social skills are not included in standardized testing, and there have been no suitable tools to assess these increasingly important skills. Some students may suppose that because letter grades are assigned for subjects but not for teamwork skills, these aspects of development are less significant. Fortunately, as students and teachers become more aware of the growing importance employers attach to teamwork, they typically add cooperative skills to their definition of what is needed for success. Comparing peer and self-impressions of performance helps students understand that each of us is not only the individual we suppose ourselves to be but also the person seen by others. Learning to unite these separate impressions can result in greater growth and achievement for all students.

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