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Nongraded versus Graded Elementary Schools: An Analysis of Achievement and Social Skills

In the last decade nongraded schools have regained popularity. Researchers and practitioners question the impact of the present applications of the nongraded structure on students. Two separate studies were conducted that compared the effects of nongraded and graded school grouping structures. The first study analyzed academic outcomes in reading, math, written language, and spelling. The second study evaluated the relationship between school type and social skills. Results indicated that students in the primary level (grades 1, 2, and 3) who attended the nongraded school performed better than their counterparts in the graded school on the reading and math assessment, but there were no differences in written language or spelling. At the intermediate level (grades 4, 5, and 6), students at the nongraded school performed better in written language and spelling, but the scores did not differ in reading or math. Students in the nongraded schools reported a higher level of social skills than students at the graded schools. The results and implications for school practice are discussed.

Au cours des dix dernières années, les écoles décloisonnées ont connu un regain de popularité. Les chercheurs et les enseignants se posent des questions quant à l'impact qu'a la structure sans classe distincte sur les élèves. On a entrepris deux études séparées pour comparer les effets des cadres cloisonnés et décloisonnés. La première a analysé le rendement académique dans les domaines suivants: lecture, mathématiques, rédaction et orthographe. La deuxième a évalué le rapport entre le type d'école et les habiletés sociales. Les résultats indiquent que les élèves de 1re, 2e et 3e années qui allaient à l'école décloisonnée obtenaient de meilleurs résultats en lecture et en mathématiques que leurs homologues dans l'école cloisonnée. Aucune différence n'a été perçue en rédaction ou en orthographe. En 4e, 5e et 6e années, les élèves de l'école décloisonnée réussissaient mieux les épreuves de rédaction et d'orthographe, mais ne manifestaient aucune différence en lecture et en mathématiques. Les élèves dans les écoles décloisonnées faisaient preuve de meilleures habiletés sociales que les élèves dans les écoles cloisonnées. On discute des résultats et des implications pour la pratique scolaire.

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The nongraded classroom, where students are educated in heterogeneous age groupings, originated in the one-room schools. By the beginning of the 20th century nongraded classrooms lost popularity in the United States (Miller, 1993), but they regained attention in the 1960s and 1970s when schools chose to combine several grade levels into one classroom unit (Anderson & Pavan, 1993). Considerable research was conducted at that time to determine the effectiveness of these classrooms in improving student outcomes. Results of this research in academic and mental health-related outcomes were inconclusive. After the 1970s the nongraded school concept became less common and was rarely seen in schools or discussed in related literature. Recently the nongraded model has regained popularity (Anderson, 1993; Mason & Stimson, 1996) and is more common than it has been for the past 100 years. For example, most elementary schools in Kentucky and Oregon as well as many in Tennessee, Pennsylvania, New York, Mississippi, California, and Texas have used the nongraded model (Anderson & Pavan, 1993; Black, 1993; Stone, 1995). Furthermore, Kentucky, Oregon, and Mississippi have legislation that mandates the use of the nongraded school model (Lodish, 1992). Prevalence estimates range from 0.3% in some states to 100% of primary-level classes using the nongraded model (Mason & Stimson, 1996). Across the country it is estimated that 5-10% of all elementary classrooms have applied the nongraded form of grouping students (Anderson & Pavan, 1993).

Graded and Nongraded Schools

In graded schools children are grouped according to their age, and teachers are responsible for one classroom of students. Most classrooms in the US currently use grade-level groupings that are based on the age of the students. Proponents of graded classrooms assume that students of the same age are best educated together. Schools in the US, however, began as nongraded classrooms, namely, the one-room schoolhouse. The graded approach to education was borrowed from Germany and implemented in the mid 1800s (Anderson & Pavan, 1993).

Although variations exist in the specific attributes of nongraded classrooms, the defining characteristic is that students are educated in groups of children who vary in age and are not grouped by traditional grade levels. Groupings are generally based on comparable skill level in students (Gutierrez & Slavin, 1992). For example, students who would otherwise receive their education in a conventional grade 2 classroom would be grouped with students in grade levels 1, 2, and 3. Instead of 25 7- and 8-year-old grade 2 students, a teacher in a nongraded classroom would have the same number of students ranging from age 6-9 in one class. Nongraded schools have been referred to in the literature as ungraded, multiage, combination, continuous progress, open concept, mixed-age, and multilevel classrooms (Black, 1993). For the sake of clarity the terms *nongraded* and *graded* are used in this article to describe the two classroom models discussed.

Rationale for Implementing Nongraded Schools

Goodlad and Anderson (1987) described several characteristics of nongraded groupings that provide a rationale for educators to implement the model. First, they stated that grouping students across age levels allows older students to assist classmates regardless of age, that it promotes cooperative learning, and

that this grouping is beneficial to students. Therefore, in contrast with students in graded classes, it is hypothesized that children in nongraded classrooms spend more time working with peers to accomplish learning objectives. As a result of increased peer interaction, less time is supposedly spent listening to a teacher lecture as a primary means of learning. Second, teachers in nongraded classrooms are expected to tailor the learning experiences to the needs of the individual child. Thus it is hypothesized that each student is more likely to reach his or her maximum potential in the nongraded classroom. The philosophy of the nongraded classroom is contrasted with that of the graded classroom where the teaching focus is often directed at the average students. Third, a developmental approach to learning is emphasized in nongraded schools. Children enter school at different stages of readiness, and the nongraded structure allows teachers to individualize according to each learner's existing skills and abilities.

Issues with retention such as the expense of educating students for additional years and the potential negative effect on student self-concept have provided an additional incentive for the nongraded classroom (Tanner & Decotis, 1995). Indeed, earlier research by McLoughlin (1970) compared students from 17 schools in eight districts. From this study McLoughlin discovered that students in nongraded programs advanced slightly faster through elementary school than children who attended graded programs. The study found that although 7.3% of the students from graded programs were retained, only 2.9% of students from the nongraded program were. Unfortunately, no information was provided about student or family characteristics, and generalizations from these results may not be appropriate to today's schools. Regardless, many of today's nongraded schools emphasize a developmental approach to student learning (Gutierrez & Slavin, 1992), which eliminates the need for retention (Nason, 1991).

Although nongraded education has some support in the research literature, controversy exists in the opinions of researchers, politicians, and parents about the nongraded classroom (Anderson & Pavan, 1993; Hicks, Edwards, & Sgan, 1973). However, students report positive attitudes toward this type of educational structure (Wong, Erickson, King, Stroller, & Allen, 1977), and parents whose children attend nongraded schools indicate acceptance of the model (Byrnes, Shuster, & Jones, 1994; Krasner & Hanley, 1984). Although studies of nongraded schools have been conducted, further research is needed to guide schools in deciding whether to implement a nongraded organizational structure.

Achievement in Nongraded versus Graded Schools

Earlier research on the outcomes of nongraded classrooms presents a complicated picture and provides discrepant information regarding their effectiveness. Studies conducted in the 1970s highlighted inconsistencies in the nongraded versus graded school research. For example, Wright (1975) found no difference between nongraded and graded schools on a group-administered achievement test. In contrast, several researchers' (Bell, Zipursky, & Switzer, 1976; Forman & McKinney, 1978) analyses of students from primary grades suggested higher achievement in reading and math in the graded classroom. Bell, Switzer, and Zipursky (1974) found that grade 1 students in the graded

classroom displayed a higher performance in reading than did their matched peers in the nongraded classroom.

The resurgence of interest in the nongraded school has resulted in updated studies of the effects of the model. For example, Matthews, Monsaas, and Penick (1997) studied the effect of nongraded educational structure on at-risk students' reading and language skills in kindergarten through grade 2 using a pretest posttest control group design. No differences were found between the nongraded and graded programs as measured by standardized group achievement tests. The interaction between type of program and grade was not significant. Matthews et al. did note, however, that students in the nongraded program had lower pretest scores in reading and language than students in the graded school, but these scores were adjusted for in the analyses.

Additional studies present support for nongraded school structures. For example, Tanner and Decotis (1995) randomly assigned kindergarten and grade 1 students to graded and nongraded classrooms. The kindergartners were compared on the Georgia Kindergarten Assessment Program (a readiness test), and no significant differences were found between the two groups. The grade 1 students' report cards were compared, and these results indicated that students in the nongraded program earned significantly better grades than students attending the graded classroom.

Several meta-analyses have investigated the effects of nongraded classrooms on children's achievement. In general, trends reported by the authors of these studies support the nongraded school as producing higher achievement than the graded classroom model. Anderson and Pavan (1993) reviewed studies from 1968 to 1990 that investigated the impact of nongraded schools on students' academic achievement. The studies measured achievement by administering standardized tests and found that 58% of the studies provided support for the nongraded format. Thirty-three percent of the studies reviewed reported no difference between nongraded and graded schools. Finally, 9% found graded schools had a greater positive effect on achievement than nongraded schools. The authors argue that the positive support for nongraded classrooms are especially convincing given that the tests are developed for graded classes and, therefore, teachers in graded classes are more likely to teach the content tested in standardized achievement measures.

Giaconia and Hedges' (1982) review of nongraded programs indicated that although the overall effect size was close to zero, achievement outcomes were slightly higher in traditional graded programs. When the effects of type of program on specific school subjects were analyzed, the authors found that in reading, results from 54% of the studies supported graded programs, 42% supported nongraded, and 4% showed no difference between the outcomes of the two types of programs. In math 52% of the studies supported the graded format, 43% supported the nongraded format, and 5% showed no difference.

In contrast, Slavin's (1987) meta-analysis reported an effect size of +.45 in favor of nongraded programs with regard to academic progress. The effect size was .00 for graded classrooms. However, difficulties often arise in using effect size to analyze differences between programs because of variability in the definition of program and the use of different tests to measure the outcomes of programs.

Gutierrez and Slavin's (1992) best-evidence synthesis also indicated that nongraded elementary programs resulted in more positive educational outcomes for students. In contrast, Veenman's (1995) best-evidence synthesis found no difference between the two types of schools. Thus no conclusive evidence is provided by the above-mentioned studies. Therefore, continued research is needed to build the research base in the area of graded versus nongraded educational structures.

Social Skills and Achievement

A significant relationship between social skills and academic performance has been discovered by various researchers (Agostin & Bain, 1997; Bursuch & Asher, 1986; Cartledge & Milburn, 1978; Gresham & Elliott, 1990; Ladd, 1990; Parker & Asher, 1987; Patrick, 1997). Specifically, social skills were positively correlated with academic performance, indicating that better social skills are related to greater academic performance. Ladd found that children who made more friends throughout the year tended also to make greater gains in standardized academic test scores than those children who made fewer friends. Patrick noted that researchers must attend to social factors to fully understand students' classroom learning and achievement.

When considering the nature and structure of the nongraded classroom, social skills in the nongraded environment become especially important (i.e., use of cooperative learning strategies, mentoring, and placement of students of varying ages in the classroom). The nongraded classroom provides increased opportunities for social reinforcement, which is important in the development of social skills. Those behaviors that result in the giving and receiving of positive social reinforcement are intercorrelated and are predictive of social acceptance (Gresham & Nagle, 1980). Social acceptance is indicative of having more friends, which as noted above is related to increased academic performance.

Gresham and Elliott (1989) reported that cooperative learning can lead to improved academic performance, as well as improved prosocial behavior. Their findings are important because cooperative learning, which is used in nongraded schools, provides increased opportunities for positive social interactions to occur and be reinforced. Social skills deficits have also been related to delayed cognitive development and impaired academic performance.

Students in a nongraded school might have better social skills than students in a graded school because of the possibility of increased opportunities to interact with other children. The inconsistent results found in studies comparing the academic performance of the two models could possibly be resolved by measuring social skills. If it is found that students at nongraded schools have better social skills, it may be necessary to implement more of the social interaction characteristics of the nongraded model into graded settings (e.g., cooperative learning, classrooms of different aged students, etc.). Conversely, if no difference exists or if students in graded schools are found to have better social skills, the strategies used in nongraded schools should not be advocated.

Rationale for the Current Study

Early in the study of nongraded education, Wong et al. (1977) suggested that the existing research lacked quality studies. These authors stated that consider-

ably more effort has been spent on defining the programmatic components of nongraded schools than on the impact of this type of educational structure. To further the problem with research on nongraded models, school curricula vary and no systematic theory exists to guide research (Franks, Marolla, & Dillon, 1974). In addition, much of the research done in the past may not apply to the current models of nongraded schools (Gutierrez & Slavin, 1992) due to changes in how nongraded schools are configured and to the unknown impact of classroom computer technology (Anderson, 1993).

The nature of nongraded schools has also changed. As stated above, the current model of a nongraded program incorporates a thematic approach to student instruction, and less emphasis is placed on a structured lecture format. More emphasis is presently placed on working in cooperative learning groups. Because of the changes in nongraded and graded education over the years, more studies comparing the outcomes of the different classroom structures in recent years have been deemed essential in guiding current educational practice (Gutierrez & Slavin, 1992; Slavin, 1992).

New evaluation tools can also be of benefit in determining program effectiveness. Most studies to date have used group achievement tests or other forms of standardized tests. The utility of standardized tests has been questioned in terms of the evaluation of program effectiveness. Therefore, a major concern with earlier related research has developed. Because assessment should reflect what is taught in the curriculum and should measure the basic skills necessary in the classroom, the use of more precise measures of curriculum is suggested. Individual and group achievement tests fall short in measuring achievement in local curriculum (Salvia & Ysseldyke, 1998; Shinn, 1989). Given the nature of the instruction and evaluation processes in nongraded classrooms, these students could be at a disadvantage when assessed by standardized assessment tools, as they might not be as familiar with the multiple-choice format as students who are attending graded elementary schools.

The purpose of the current study was to investigate further the differences in student outcomes for nongraded and graded schools. Research to date is inconclusive and measurement techniques vary. Thus it is difficult to make definitive conclusions from the existing literature. Further, achievement assessments are more precise today in their ability to measure what is actually taught in the curriculum.

A major omission in the nongraded studies is the impact of the model on social skills. Although studies have addressed self-esteem (Ford, 1977; Wright, 1975), attitude (Arlin, 1976; Ford, 1977; Giaconia & Hedges, 1982; Hatley, Holloway, & Hiebert, 1977; Klaff & Docherty, 1975; Tanner & Decotis, 1995), locus of control (Wright, 1975), and anxiety (Bell et al., 1976; Wright, 1975) with conflicting results, not one has analyzed social skills. Given the relationship between social skills and achievement, the emphasis on cooperative learning and the social nature of education in nongraded programs, the investigation is highly relevant.

Thus two separate studies were undertaken to investigate the two important variables of achievement and social skills. First, student achievement in reading, math, and written language was compared. Based on earlier research

it was hypothesized that the nongraded school would produce higher levels of achievement than the graded school. Sex and years in school were also investigated. Anderson and Pavan (1993) theorized that boys would benefit more from nongraded classes than girls. They further suggested that students in later elementary years would benefit more than those in the earlier years.

Second, social skills of students in graded and nongraded elementary schools were investigated. Because the general practice in nongraded schools is to encourage interaction among students in the learning process, it was hypothesized that children in nongraded programs would report higher levels of social skills than students in the graded programs. Moreover, the specific area of cooperation was hypothesized to be the best predictor of the nongraded school. Assertiveness, self-control, and empathy were not suggested to be predictive of the nongraded school structure.

Study 1: Method

Participants

A total of 303 students from two elementary schools from one district in the Midwest participated in the study (see Table 1). The racial composition of the district consisted of 93% Caucasian, 3% Hispanic, 2% African American, 1% American Indian or Alaskan Native, and 1% Asian or Pacific Islander.

One of the classes at the graded elementary combined grades 5 and 6 students because of overflow in the enrollment in each of these grades. Students from the combined classroom were allowed to participate in the study, but their results are not included in the statistical analyses. The combined class was not believed to affect any of the other classrooms. All other classrooms in the graded school used the traditional graded model. After excluding students from the combined class at the graded school, the total number of participants included in the sample was 293.

Setting

School A (graded) and School B (nongraded) were selected from the same school district. They were chosen because of comparable percentages of students who received free and reduced-cost lunch (School A: 45%; School B: 60%). This technique has been used in earlier research (Entwisle & Astone, 1994). Both schools were in a lower socioeconomic status section of the city. The teaching staff had been relatively constant in both schools for several years prior to the study. In addition to the teaching staff, each school was assigned identical support staff including a school psychologist, a speech-language pathologist, and a Chapter I teacher (specialized reading teacher). The schools used curriculum-based measurement to monitor regular and special education student progress throughout the year. It should be noted that parents had the option of open enrollment; however, few families exercised this option.

School A

School A, the graded school, included students from kindergarten through grade 6 as well as a preschool classroom for children with special needs. A total of 456 students were enrolled. The school educated students in graded-level groupings. School A had 19 regular education classrooms and four special education programs taught by 32 teachers (4 were special education teachers) and six teacher associates. A traditional lecture approach to teaching was used,

Table 1
Participants by Grade and Sex in Study 1

Grade	School A (graded) Boys	Girls	School B (nongraded) Boys	Girls	Total
1	15	18	12	13	58
2	12	20	11	10	53
3	8	13	12	14	47
4	15	15	10	16	56
5	16	16	4	13	49
6	5	9	5	11	30
Subtotal	71	91	54	77	
Total	162		131		293

Note. In order to make comparisons between the two schools, teachers at the nongraded school designated the grade level that the child would be in if he or she were attending a graded school.

with the large classroom as the unit of instruction. Individual instruction was implemented as needed, but was not an integral part of classroom practice. No support for team teaching or cooperative learning was provided.

School B

School B, the nongraded school, had 520 students enrolled and also included an at-risk preschool program. The school consisted of 26 teachers and nine teacher associates and four special education teachers. The nongraded program, initiated by the principal, had been implemented for seven years. The school was initially nongraded only in the primary grades and then expanded to include the rest of the school three years later. Teachers taught in classes that included either two or three traditional grade levels of students with a ratio of one teacher per traditional grade level included. Team teaching and cooperative learning were integral parts of the program, and individualized instruction was used in a developmental context. That is, instruction was tailored to the individual student's readiness skills. Less emphasis was placed on learning from textbooks. Instead, students used reference materials that were available in their library and classrooms, as well as asking other students and their teachers when they needed assistance. In addition, thematic instruction was incorporated into the curriculum.

Materials

Curriculum-Based Measurement (CBM) was used to measure student achievement in reading, math, and written language and was selected because of its effectiveness in measuring basic skills. The advantages of CBM over traditional standardized measures of achievement are that CBM is better at detecting individual differences and is a direct, specific measure of the basic skills involved in reading, math, and written language (Shinn, 1998).

Reliability and validity of CBM has been well documented. Shinn (1989) provided evidence of reliability by summarizing numerous studies. Test-retest reliability for reading (.82 to .97); written expression: total words written (.42 to .91); written expression: words spelled correctly (.46 to .81); and math (.78 to

.93) was reported. Alternate-form reliability for reading (.84 to .96); written expression: total words written (.42 to .95); written expression: words spelled correctly (.41 to .95); and math (.48 to .72); and interrater reliability (reading .99, written expression .98, and math .90 to .99) also exists across the measures.

Evidence of construct validity comes from reviewing studies that correlated CBM with other achievement measures. The results indicated that correlations ranged from approximately .60 to .80 for reading, which purports to be the indicator of whether a test has adequate construct validity. Correlations between CBM and standardized achievement measures for written language and math were slightly lower, but thought to represent the basic skills they measured. The relevance and utility of CBM are said to be its strength in measuring basic skills (Shinn, 1998).

Procedures

Parental consent and student assent were obtained for all participants. Only two students who had parental consent chose not to participate. Students were administered the measures in small groups in their schools during the school day. Groups ranged in size from two to eight. The primary researcher, graduate students, and undergraduates collected data. All those involved with the data collection were trained on administration procedures. Training occurred in three separate sessions with opportunities to practice the procedures and receive feedback. A script of the specific instructions was provided to each person involved in data collection. Measures were counterbalanced for order, and the effect was nonsignificant.

The district's CBM probes for reading, math, and written language were used in the study. The Shinn (1989) method for developing and administering probes was used. In the areas of reading, probes had been developed by taking passages from the districts reading series. Three reading passages were formulated for each grade level text. Reading probes were individually administered, and students read from each passage for one minute. Three individual scores were then computed for each student, each score representing the words read in each passage for the one-minute interval. The median word-per-minute score was selected as the most stable measure of the child's reading fluency.

Math probes were also developed for each of the six grade levels. In grades 1, 2, and 3, addition, subtraction, and mixed (a combination of addition and subtraction) problems were compiled. Probes for grades 4, 5, and 6 consisted of multiplication, division, and mixed (a combination of multiplication and division) problems. At each grade level students were administered three two-minute probes, each representing one of the three types of problems (i.e., addition, subtraction, and mixed for grades 1, 2, and 3, and multiplication, division, and mixed for grades 4, 5, and 6). Responses were scored according to the correct number of digits per item. For example, the answer of 134 consists of three digits. If the student's answer was 34, she or he would receive credit for two of the three digits recorded correctly. Every student received three scores for math: addition, subtraction, and mixed in grades 1, 2 and 3, or multiplication, division, and mixed in grades 4, 5, and 6.

To measure written language according to CBM procedures, students were first presented with a story starter that was a brief sentence that included a simple topic. Students were instructed to think about their story for one minute

and then write for three minutes. A total score representing words written was computed. Words did not need to be spelled correctly to be included in the total score.

Data Analysis

Data were analyzed using the SPSS-X statistical package. Descriptive statistics and analyses of variance were computed. This study used a series of 2 x 2 analyses (School Type x Sex). The dependent variables were students' scores on the CBM reading, math, and written language probes. Age levels were divided by primary (grades 1, 2, and 3) and intermediate level (grades 4, 5, and 6), and analyses were conducted at each level. An alpha level of .05 was considered significant for all analyses.

Results

Means and standard deviations of the instruments are reported in Tables 2 and 3. Table 2 provides the descriptive statistics by school, and Table 3 presents the data by sex. The results of the analysis of the relationship among variables is presented in the following sections.

Reading. A main effect was found for type of school, $F(1, 154)=5.16$, $p=.024$, at the primary level but not at the intermediate level, $F(1, 129)=.007$, $p=.934$. At the primary level the mean for the nongraded school was higher than the graded school. The effect of sex was significant at both the primary, $F(1, 154)=7.39$, $p=.007$, and intermediate level $F(1, 129)=4.55$, $p=.035$. Girls read more words per minute than boys at both levels. The interaction between school and sex was not significant at the primary, $F(1, 154)=.16$, $p=.69$, or intermediate level, $F(1, 129)=.37$, $p=.55$.

Math: addition. Addition was assessed at the primary level only. The effect of type of school was significant, $F(1, 154)=7.23$, $p=.008$. The nongraded school had a higher mean than the graded school. No effect by sex was found, $F(1, 154)=.31$, $p=.58$, and the interaction between type of school and sex was not significant, $F(1, 154)=.27$, $p=.60$.

Math: subtraction. As with addition, subtraction was assessed only at the primarily level. Similar results were found. Type of school was statistically significant, $F(1, 154)=12.07$, $p=.001$, with the nongraded school demonstrating a higher mean than the graded school. No effect by sex was found, $F(1, 154)=.03$, $p=.869$. The interaction between school and sex was not significant, $F(1, 154)=.28$, $p=.60$.

Math: multiplication. Multiplication was administered only at the intermediate level. The main effects for type of school, $F=(1, 130)=.10$, $p=.76$, and sex were not statistically significant, $F(1, 130)=.34$, $p=.56$. Furthermore, the interaction between school and sex was not significant, $F(1, 130)=.30$, $p=.59$.

Math: division. As with multiplication, division was administered only to the intermediate level students. Similar results were found for division. No significant main effects for type of school, $F(1, 130)=.79$, $p=.38$, or sex, $F(1, 130)=.11$, $p=.74$, or the interaction were found, $F(1, 130)=.001$, $p=.974$.

Math: mixed fact. Mixed level probes were administered to all participants. A significant main effect for type of school was found at the primary level, $F(1, 154)=18.72$, $p=.0001$. The mean for the nongraded group was higher than the mean of the graded group. The effect of type of school was not significant at the

Table 2
Means and Standard Deviations for the Variables by School in Study 1

	School A		School B	
	Primary (n=86)	*Intermediate (n=75)*	*Primary (n=72)*	*Intermediate (n=59)*
Reading	54.57 (34.11)	106.26 (39.69)	67.89 (48.22)	109.92 (56.46)
Addition	33.59 (16.59)	—	41.28 (20.09)	—
Subtraction	15.21 (10.18)	—	21.60 (12.64)	—
Multiplication	—	71.09 (24.38)	—	69.95 (35.70)
Division	—	36.33 (17.35)	—	33.07 (22.00)
Mixed Math	12.45 (7.59)	31.53 (16.89)	18.42 (9.69)	28.46 (18.47)
Written Language	24.19 (13.56)	41.47 (15.42)	27.61 (14.71)	49.39 (16.26)
Spelling	20.28 (13.69)	38.89 (15.98)	23.42 (14.92)	47.66 (15.91)

Note. A dash indicates the instrument was not administered to that age group.
One of the intermediate students from School A had missing data and was omitted from the analyses.

intermediate level $F(1, 130)=1.23$, $p=.27$. No main effects were found for sex at the primary, $F(1, 154)=.14$, $p=.71$, or intermediate level, $F(1, 130)=.60$, $p=.44$. The interaction between type of school and sex was not significant at the primary, $F(1, 154)=.023$, $p=.88$, or intermediate level, $F(1, 130)=.22$, $p=.64$.

Written language. The main effect of type of school approached significance but was not statistically significant at the primary level, $F(1, 154)=5.81$, $p=.075$. At the intermediate level the effect of type of school was statistically significant, $F(1, 130)=4.90$, $p=.03$. Significant main effects for sex were found at both the primary, $F(1, 154)=9.19$, $p=.003$, and intermediate level, $F(1, 130)=43.19$, $p=.0001$, with the mean for girls being higher at both levels. The interaction of type of school and sex was not significant at the primary, $F(1, 154)=.10$, $p=.76$, or intermediate, $F(1, 130)=.10$, $p=.76$, level.

Table 3
Means and Standard Deviations for the Variables by Sex and Level in Study 1

	Boys		Girls	
	Primary (n=70)	*Intermediate (n=55)*	*Primary (n=88)*	*Intermediate (n=79)*
Reading	51.46 (40.09)	97.24 (47.53)	67.94 (41.45)	115.38 (46.67)
Addition	36.49 (20.04)	—	37.49 (17.52)	—
Subtraction	18.57 (12.33)	—	17.76 (11.37)	—
Multiplication	—	68.91 (30.54)	—	71.76 (29.38)
Division	—	35.87 (20.75)	—	34.22 (18.73)
Mixed Math	15.14 (9.35)	29.07 (15.12)	15.19 (8.92)	30.95 (19.20)
Written Language	22.19 (12.24)	34.95 (13.99)	28.58 (14.97)	51.92 (13.91)
Spelling	17.94 (12.08)	32.53 (14.18)	24.70 (15.27)	49.51 (14.28)

Note. A dash indicates the instrument was not administered to that age group.

Spelling. The effect of type of school was not significant at the primary level, $F(1, 154)=2.75$, $p=.10$. Type of school was, however, significant at the intermediate level, $F(1, 127)=5.59$, $p=.02$. An examination of the means indicated that students at the nongraded school outperformed students at the graded school. The main effect of sex was significant at both the primary, $F(1, 154)=9.97$, $p=.002$, and the intermediate, $F(1, 127)=39.23$, $p=.0001$, levels. Girls outperformed boys at both levels. The interaction between type of school and sex was not significant at the primary level, $F(1, 154)=.08$, $p=.78$, or intermediate level, $F(1, 127)=.04$, $p=.85$.

Discussion

The results of the current study favor the nongraded structure or indicate no difference between the two school structures depending on what is measured, thus partly supporting the hypothesis that the nongraded school structure would produce higher achievement outcomes than the graded programs. None of the analyses found the graded school as superior in producing higher achievement scores. The results differed for the primary and intermediate grades. At the primary level the students in the nongraded school outperformed the students in the graded school in reading and math, but significant differences were not found between the two types of schools in written language and spelling. At the intermediate level the opposite effect occurred. Students in the nongraded school performed significantly better than the students in the graded school in written language and spelling, but no differences were found in reading and math.

Although organizational practice was not directly measured, certain hypotheses can be generated based on the results of this study combined with earlier research. One possible explanation for these results favoring the nongraded structure is that the school could potentially be successful in its grouping of students for instruction and providing more individualized time with teachers. These two areas were reported by Gutierrez and Slavin (1992) as important components of successful nongraded education. Furthermore, the Gurierrez and Slavin review of related research suggested that more homogeneity in grouping students resulted in higher levels of success in the nongraded programs. The nongraded school used in the current study comprised students from similar socioeconomic status and ethnic backgrounds. Thus the nature of the sample may have affected the results of the study.

Interestingly, the impact on achievement was different at different age levels. The amount of time spent with the teacher and homogenous groupings may affect the academic areas differently. Reading and math may be more sensitive to teacher feedback at young ages when these skills are first developing. Writing is taught to younger students, but teachers tend to emphasize reading more. Writing skills are emphasized more in later years of elementary school and thus may show more of a benefit for the nongraded classroom at the intermediate level. As students require more complex feedback for their writing, the nongraded program may result in more progress.

Sex differences were found in certain academic areas. Girls outperformed boys in reading, writing, and spelling at both the primary and intermediate levels. Sex differences were not found in math. These results are consistent

with many studies that find girls score higher than boys in elementary school with the exception of boys and girls not differing in math.

Anderson and Pavan (1993) suggested that an interaction between sex and grade would be found in the nongraded versus graded classrooms. Their hypothesis was not supported by the current investigation. Girls outperformed boys in reading and written language, and the sexes were equal in math, regardless of the type of school.

The results of the current study contradict recent research conducted by Matthews et al. (1997) that found no differences in reading and language skills in kindergarten through grade 2 using standardized measures of achievement. In these early grades the current study found that children in the nongraded school performed better in reading and math. However, the groups varied slightly, and this may partly account for the discrepant findings. The current study analyzed primary students in grades 1 through 3. Including kindergartners and excluding grade 3 students might have affected the results. Moreover, the measurement technique may not have been sensitive enough to detect the differences. Curriculum-based measurement may have been more sensitive to finding group differences. The sample characteristics in the two studies were similar with the exception of ethnicity, with Matthews et al.'s study including a more diverse group of students. Interestingly, earlier research suggests that ethnic minorities perform better in nongraded schools (Anderson & Pavan, 1993), possibly because the nongraded program is better able to match the school experiences with the students' cultural experiences (Delpit, 1992).

Wright (1975) suggested that schools that had implemented nongraded programming for a longer period may demonstrate increased benefits. This may well be the case in this study. The nongraded school used in the study had been in effect for several years, and modifications were made over the years to improve the program. Thus the positive impact that the nongraded program had on the academic achievement scores in some areas may be due to the longevity of the program. Other studies may have investigated the effect of the nongraded structure at an earlier phase in the implementation process.

Study 2: Method

Participants

A total of 134 students from four elementary schools (2 graded, 2 nongraded) in the Midwest participated in the study. Informational letters were sent to the parents of students, asking for their assistance in the research project. Sixty-seven students represented the nongraded schools, and 67 students represented the graded schools. Students were identified according to their grade level and included those in the grades 4, 5, and 6. The students in these grades were able to assess more accurately their social skills than those in kindergarten, grade 2, and grade 3. Students with mild, moderate, or severe mental handicaps (i.e., IQ below 70) were excluded from the study. Boys and girls equally represented the two types of schools. Twenty-six boys represented the graded schools, and 26 boys represented the nongraded schools. Similarly, 41 girls represented the graded schools, and 41 girls represented the nongraded schools. Participants were not racially diverse.

Setting

Four schools were selected from the same district in the Midwest, two graded and two nongraded schools. The nongraded schools were designed on the basis of the nongraded model and employed its theories. In nongraded classrooms children were grouped with other students of varying ages. Cooperative learning was emphasized, and students were encouraged to interact with their peers in the learning process. Graded schools consisted of classrooms for each designated grade. Classrooms in the nongraded schools had students representing two or three grade levels.

Materials

The Social Skills Rating System (SSRS, Gresham & Elliott, 1990) is a measure of a student's social behavior and is administered to students in grades 3 through 6. Three versions of the SSRS are available: a parent report, a teacher report, and a student self-report. The student self-report was used in this study to obtain each student's perception of the degree to which he or she was successful in the area of social skills. The questions assess students' empathy, self-control, assertiveness, and cooperation, all of which are related to school success to varying degrees.

The psychometric properties of the SSRS are reported in the manual (Gresham & Elliott, 1990). Internal consistency for the Total Scale of the Student Form is .83 with subscale coefficients ranging from .67 to .77. Test-retest reliability coefficients representing a four-week interval between testing were .68. The authors state that, given the reliability of the SSRS, this level of stability is satisfactory. The validity of the SSRS was evaluated in terms of content, criterion-related, construct, and social validity. All were reported to be adequate for use with the Student Form.

Data Analysis

First, means and standard deviations were calculated. Second, a 2 x 2 between-subjects analysis of variance compared the effects of type of school and sex on social skills. Sex was included because of earlier findings indicating differences in social skills between boys and girls (Gresham & Elliott, 1990). Third, a stepwise regression analysis was conducted to determine which of the predictor variables (i.e., raw scores from the SSRS subscales: assertion, cooperation, empathy, and self-control) best predicted the criterion variable (i.e., graded vs. nongraded). Thus type of school was regressed on the assertion, cooperation, empathy, and self-control raw scores.

Results

Descriptive Statistics

Means and standard deviations for the graded and nongraded schools were calculated and are presented in Table 4. The nongraded sample had an overall higher social skills score than did the graded sample. In addition, girls generally had higher scores than boys regardless of type of school.

To compare the effect of sex and type of school on social skills, a 2 x 2 between-subjects analysis of variance was conducted. As predicted, significant main effects were found for both sex $F(1, 134)=16.43$, $p<.05$ and type of school $F(1, 134)=9.64$, $p<.05$. Thus girls had significantly higher self-reported social skills scores than boys. Furthermore, students from the nongraded schools had

Table 4
Means and Standard Deviations of the Nongraded and Graded Students in Study 2

	Graded		Nongraded	
	M	*SD*	*M*	*SD*
Cooperation: Male	13.1	3.2	14.1	3.0
Cooperation: Female	14.9	3.2	16.2	2.8
Assertion: Male	12.1	2.8	13.7	2.2
Assertion: Female	14.0	2.8	14.4	2.2
Empathy: Male	14.3	3.2	15.4	3.0
Empathy: Female	16.0	3.3	17.2	2.5
Self-Control: Male	9.9	3.2	11.2	3.7
Self-Control: Female	11.2	3.0	13.2	3.0
Total Scale: Male	48.4	10.5	54.4	10.3
Total Scale: Female	56.0	11.0	61.0	8.1
Total Standard Score: Male	96.3	14.8	105.0	15.0
Total Standard Score: Female	100.6	18.3	108.6	14.5
Total Standard Score	98.9	17.1	107.2	14.7

Note. Standardization group Total Scale scores for grades 4, 5, and 6 males were 51.3, 49.6, and 53.1 respectively. Sample group Total Scale scores for grades 4, 5, and 6 females were 56.1, 55.9, and 55.1 respectively.

significantly higher self-reported social skills scores than students from the graded schools (see Table 4). Also, as predicted, no significant interaction between type of school and sex was obtained $F(1, 134)=.08$, $p>.05$.

The results of the stepwise regression revealed that self-control best predicted the type of school. Self-control accounted for 6% of the variance found in the type of school, $R^2=.06$, $F(1, 132)=9.96$, $p<.01$. The β was .27, $t=3.16$, $p<.01$. If the F value for a particular variable was greater than or equal to .100, it was removed from the equation. The remaining predictor variables, assertion, cooperation, and empathy, were not entered into the equation for this reason. The β for the cooperation raw score was .04, $t=.35$, $p>.05$, the β for the assertive raw score was –.04, $t=-.32$, $p>.05$, and the β for the empathy raw score was –.01, $t=-.07$, $p>.05$. These insignificant beta weights indicate that the addition of the cooperation, assertive, and empathy scores did not add anything new to the prediction of the type of school. Thus self-control was the best predictor of the type of school.

Discussion

Results from the analysis indicated that students at the nongraded schools had significantly higher social skills than students in the graded schools. Cooperative learning was used in the nongraded schools, but not in the graded schools. Thus the characteristics of the nongraded schools in the present study purport to provide increased opportunities for social interactions among students. This increase in social interactions may be one reason for the findings of the current study.

Specifically, self-control was the best predictor of the type of school, graded or nongraded. This finding was in contrast to the prediction that the coopera-

tion scale would be the best predictor. Further investigation of specific items on the SSRS revealed that the self-control scale may actually better reflect the characteristics of the nongraded model. The self-control scale on the SSRS includes items such as questioning unfair classroom policies, discussing issues with classmates, and receiving academic assistance from peers. Because students in a nongraded school are more likely to be taught to work cooperatively with others, they may feel more comfortable asking others for help than students in a graded school, as these items would seem to indicate. Another possible explanation for this result is that younger children learn self-control from older children in the classroom.

The current study found that students at the nongraded schools had higher social skills; however, it is difficult to determine what specific skills are differentiated in the nongraded setting. Although these findings are an important first step in determining the relationship between social skills and type of school structure, it is important to remember that the research is correlational and does not indicate causality.

General Discussion

Implications for Educators

Educators are concerned with providing learning environments that increase academic and social gains in children. Although the focus of these two studies was on organizational structure and not instructional practice, differences in instructional practices were reported by the principals. The principals in the nongraded schools in this study reported a strong emphasis on cooperative learning, team teaching, and individualized instruction, whereas the principals in the graded schools did not. In fact the graded schools were traditional in their approach to instruction and did not encourage cooperative learning, team teaching, or individualized instruction in the classes.

Results from this study suggest that nongraded schools may have academic benefits for students, especially at the primary level in reading and math and at the intermediate level in written language. These differences were found by using more sensitive measures than earlier research. Therefore, these results may better reflect actual student performance in the schools where the study occurred. For those educators concerned that students may fall behind academically if the nongraded school structure is implemented, this study provides evidence to the contrary. For example, the nongraded structure may actually be more helpful in meeting the unique learning needs of students in elementary school. In the nongraded setting, teachers may be encouraged to teach to the individual needs of the students rather than the average level of the class. Furthermore, the amount of time teachers spend with students is a critical variable for academic success. In addition, creative groupings of students may meet the diverse needs of today's classrooms. Training in nongraded education is crucial to ensure that teachers are given the necessary tools to implement the program effectively. This is not to say that we can draw the conclusion that nongraded groupings are necessarily superior; we can only say that in the two schools investigated, they resulted in positive or neutral student outcomes.

Along with academic differences, higher levels of social skills were reported in intermediate-level children at the nongraded school. We do not know if

these differences would have been reported in primary grades, because the instrument used to measure social skills is not validated for that age group. This study provides interesting preliminary evidence for the social benefits of nongraded programs. The results suggest that the students perceive higher levels of skill when educated in a nongraded environment, especially in the domain of self-control. Students may be benefiting from the nongraded structure by learning how to manage themselves and their school day more effectively. Given the number of schools implementing social skills programs, these findings may provide an alternate means of enhancing these skills.

Overall, the findings of the present study add to and support research on the nongraded model. Although earlier research has been inconclusive, this study offers additional evidence in support of the nongraded model. Because of the supportive evidence offered from the current study, changes in the educational environment of children should be considered. Educators should further evaluate and consider the characteristics of the nongraded model to obtain the best student outcomes. Continual progress, cooperative learning-teaching, mentoring, and individualized instruction all characterize the nongraded setting; however, they should be considered important characteristics of all educational settings. The findings of the current study, among others, provide evidence regarding the type of environments in which students learn best. All professionals working in education should be knowledgeable about the best learning environments in order to better serve students. Administrators in particular should be knowledgeable about these and other research findings, as they can use research evidence to advocate for changes in educational systems.

Limitations and Implications for Future Research

Although this research provides support for nongraded education, the results should be interpreted cautiously because of the limitations of the research. One limitation is that only two schools were compared in the first study and four in the second study. Future research addressing achievement and social skills should include more schools in the categories of graded and nongraded models. In addition, the impact of nongraded education should be analyzed in schools with more economic and ethnic diversity. An additional limitation of this research was that a teacher or parent rating of social skills was not included. This rating might have provided valuable information about how others perceive students' level of social skills and will be important to include in future studies. A final limitation in this type of applied research is that extraneous variables could have influenced the results. For example, a measure of the instructional practices in the classrooms would have greatly enhanced the research and should be considered in future studies. Unfortunately, controlling teacher and classroom variables can be difficult in applied research.

Conclusions

The purpose of the current research was to contribute to the empirical base of knowledge pertaining to nongraded and graded educational programming. Specifically, we refined the measurement of academic achievement and provided the novel assessment of social skills. This study suggests that the non-

graded classroom structure should be considered by educators as a viable alternative to graded education.

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