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ABSTRACT

Research on the educational outcomes of cooperative learning strategies suggests that educators can "have their cake and eat it too" since these strategies have been found to promote simultaneously high achievement, constructive student-student relationships, positive attitudes toward subject areas, continuing education, critical thinking, cooperative tendencies, and psychological health. Cooperative strategies can eliminate the necessity of choosing between strategies which promote either academic achievement or cognitive development and socialization. This paper reviews the research on the relative impact of cooperative, competitive, individualistic, and traditional instructional methods on a wide range of eduational outcomes. Results of meta-analysis of the available research on two of the most frequent dependent variables in this education research, i.e., achievement and interpersonal relationships, are reported in detail including among others the use of higher quality reasoning strategies, higher level cognitive processing, mastery of social competencies, and development of sex-role identity. Major approaches to the development of cooperative learning strategies are described including:(1) direct application where specific curriculum procedures are used; and (2) conceptual application using general procedures and principles to formulate a unique set of instructional procedures. The immediate future directions of the research efforts on cooperation and schooling are discussed and problems with previous research are outlined. (JAC)

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Achievement Vs. Development/Socialization

Educators are often asked to choose between instructional strategies that promote achievement and instructional strategies that promote cognitive and social development and socialization. The late 1960's were especially filled with conflicts between educators and psychologists who wished to promote healthy development and socialization and those educators and psychologists who wished to maximize achievement. With the "back-to-basics" movement, the latter have dominated the past 10 to 12 years. At the same time our society has moved into a crisis over the quality of our "human capital" that calls into question the ability of our educational system to provide our society with psychologically well-adjusted and competent individuals who are motivated and able to pursue careers in scientific and technological fields. There is growing recognition, for example, that no country can build a high quality economy with a low quality work force, and that American productivity relies more on people than on machines. In order to provide our society with a high quality work force there are a number of outcomes that must be maximized by our educational system, including:

1. The positive attitudes toward subject areas such as math and science required to generate continuing motivation to study, take advanced training in, learn more about, and enter careers related to science and math.

2. The development of critical thinking competencies and the use of higher level reasoning strategies.
3. The ability to utilize one's knowledge and resources in collaborative activities with other people in career, family, community, and society settings.
4. The psychological health and well-being required to participate effectively in our society.
5. The mastery of facts, information, and competencies taught in school.
6. The high quality and positive relationships with other children and adolescents required for healthy cognitive and social development and constructive socialization.

While considerable controversy has raged over the choice between academic achievement and constructive development and socialization, the need for instructional strategies that would do both simultaneously has been highlighted. It is now possible to "have our cake and eat it too" through the use of cooperative learning strategies. The purposes of this paper are to:

1. Review the considerable advances in knowledge about the relative impact of cooperative, competitive, individualistic, and "traditional" instructional methods on a wide range of educational outcomes.
2. Point out the considerable advances in sophistication and specificity of the application of cooperative learning methods to instructional situations.
3. Discuss the immediate future directions of the research efforts on cooperation and schooling.

Achievement And Interpersonal Attraction

There has been considerable research comparing the relative effects of cooperative, competitive, individualistic, and "traditional" instructional procedures conducted during the past 10 years. These studies can be classified into four categories:

1. Lab-experimental studies that either test theory or replicate the results of previous studies, but lack clear ties to practice.
2. Large scale surveys that similarly test theory or provide useful information, but lack clear implications for practitioners.
3. Field-experimental studies that are methodologically sound, test theory or replicate previous work, and contain operationalizations that have relevant application to practical situations.
4. Field-evaluations that concentrate on developing applied procedures but lack basic methodological requirements such as random assignment of subjects to conditions (although they may use control groups). They build clear bridges to practice and validate applied procedures, but are less relevant for testing theory.

All four types of studies are valuable, and together they provide an integrated body of research that is one of the most substantial literatures within education and psychology. There are literally hundreds and hundreds of studies conducted by hundreds of different investigators with subjects of all age levels and in many different types of settings and utilizing a wide variety of tasks and subject areas.

While a wide variety of outcomes have been studied in this literature, the two most frequent dependent variables seem to be achievement and interpersonal relationships among participants. We have recently completed meta-analyses of the available research in both of these areas.

Achievement

In our meta-analysis on achievement (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981) we reviewed 122 studies conducted between 1924 and 1981 that yielded 286 findings. These studies compared the relative effectiveness of cooperative, coooperative with intergroup competition, interpersonal competitive, and individualistic goal structures in promoting achievement and productivity in North American samples. The results indicate that cooperative learning procedures tend to promote higher achievement than do competitive and individualistic learning procedures. These results hold for all age levels, for all subject areas, and for tasks involving concept attainment, verbal problem-solving, categorizing, spatial problem-solving, retention and memory, motor performance, and guessing-judging-predicting. For rote-decoding and correcting tasks, cooperation seems to be equally effective as are competitive and individualistic learning procedures.

In completing this meta-analysis we hoped that it would move interested researchers away from basic comparison of productivity toward examination of the variables that may moderate or mediate the relations between the goal structures and achievement. In a recent paper (Johnson & Johnson, 1982) we detailed a number of explanatory variables. They are:

1. The use of higher quality reasoning strategies.
2. The occurrence of constructive controversy among collaborators.
3. The occurrence of higher level cognitive processing.
4. Collaborators regulating each others' task efforts and providing task-related feedback to each other.
5. The active involvement in learning required by verbally interacting with collaborators.

6. The greater cohesion and interpersonal attraction found among collaborators.

Interpersonal Attraction

In our meta-analysis of the research examining the relative impact of cooperative, competitive, and individualistic learning situations on interpersonal attraction among students (Johnson, Johnson, & Maruyama, 1982) we reviewed 95 studies conducted between 1944 and 1982 that yield 233 findings. The results indicate that cooperation promotes greater interpersonal attraction among students than do competitive or individualistic learning situations. This is true even when students are from different ethnic groups and when nonhandicapped and handicapped students are placed in the same classroom. The importance of these results cannot be overestimated, as there is considerable evidence that constructive peer relationships are vital for:

1. The socialization of values, attitudes, competencies, and perspectives.
2. Psychological health.
3. The mastery of social competencies.
4. The reduction of isolation and alienation.
5. The reduction of the occurrence of socially dysfunctional behavior.
6. The promotion of the occurrence of prosocial behavior.
7. The mastery of impulses such as aggression.
8. The development of sex-role identity.
9. The emergence of perspective-taking ability.
10. The acquisition of high educational aspirations.

Other Important Educational Outcomes

While the majority of the research on cooperative, competitive, and individualistic learning situations has concentrated on achievement and interpersonal attraction the past 20 years, there are a number of other important educational outcomes that have been examined. These variables include:

1. Positive attitudes toward the subject area being studied and continuing motivation to learn more about the area.
2. Use of higher level reasoning strategies and the development of critical thinking competencies.
3. Ability to contribute one's knowledge and competencies to collaborative efforts by other people in career, family, community, and society settings.
4. Psychological health.

Each of these variables will be briefly discussed.

Attitudes Toward Subject Areas

To provide a high quality labor force for our society graduates from our educational system must have a high degree of scientific and technological literacy and a high percentage of our top students must enter science related-careers. Yet there is considerable evidence that most students in the United States dislike science, fail to take advance science courses in high school, and are not majoring in science and related careers in college (Walberg, 1982). There is a critical need, therefore, to develop instructional strategies that will promote more positive attitudes toward the subject area being studied and increase students' continuing motivation to study,

take further courses in, enter careers, and learn more about that subject area. Our colleagues and ourselves have conducted a series of studies indicating that cooperative learning experiences, compared with competitive and individualistic ones, promote more positive attitudes toward the subject area and the instructional experience (Garibaldi, 1979; Gunderson & Johnson, 1980; R. Johnson & Johnson, 1979; Johnson, Johnson, & Skon, 1979; Lowry & Johnson, 1981; Smith, Johnson, & Johnson, 1981; Wheeler & Ryan, 1973). There is also evidence that cooperative learning experiences promote more continuing motivation to learn than do individualistic learning experiences (Lowry & Johnson, 1981; Smith, Johnson, & Johnson, 1981).

Higher Level Reasoning Strategies

In many subject areas related to science and technology the teaching of facts and theories is considered to be secondary to the teaching of critical thinking and the use of higher level reasoning strategies. The aim of science education, for example, has been to develop individuals "who can sort sense from nonsense," or who have the critical thinking abilities of grasping information, examining it, evaluating it for soundness, and applying it appropriately. The superiority of cooperation over competitive and individualistic efforts in promoting achievement on problem-solving and reasoning tasks (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981) indicates that cooperation may promote more critical thinking. We have found in our own studies that students in cooperative learning situations use higher level reasoning strategies than do students in competitive and individualistic learning situations (Johnson & Johnson, 1981; Johnson, Skon, & Johnson, 1980; Skon, Johnson, & Johnson, 1981).

Collaborative Competencies

Schooling is future oriented in the sense that the instruction taking place is primarily aimed at preparing students for career and adult responsibilities. And the assumption is made that students will be able to apply successfully what they learn in school to career, family, community, and society settings. It does no good to train an engineer or secretary, for example, if the person cannot work effectively with other people and maintain a job as an engineer or secretary after they have finished school. The industrial strategy of Japan is a good illustration of this principle. Japanese management has been quoted as stating that the superiority of the Japanese industrial system is not based on the fact that their workers are more intelligent than are the workers of other countries, but that their workers are better able to work in harmony and cooperation with each other. While there is sparse evidence that cooperative learning experiences promote the development of cooperative skills and competencies than do competitive or individualistic learning experiences, there is solid evidence that the cooperative skills and competencies are used and practiced in cooperative learning experiences more so than in competitive and individualistic ones (Johnson, Johnson, Roy, & Zaidman, 1982; Lyons, 1982).

Psychological Health

When students finish school it is important that they have the psychological stability to build and maintain career, family, and community relationships and perceive a basic and meaningful interdependence with other people. We have conducted two correlational studies directly relating cooperative, competitive, and individualistic attitudes with a wide variety of measures of psychological health, one focusing on high school seniors (Johnson &

Norem-Hebeisen, 1977) and one focusing on incarcerated adolescents and adults (James & Johnson, 1982). In our initial study with high school seniors we found cooperativeness to be positively related to a number of indices of psychological health such as emotional maturity, well adjusted social relations, strong personal identity, and basic trust and in and optimism about other people. Competitiveness was also positively related to a number of indices of psychological health, while individualistic attitudes were related to a number of indices of psychological pathology, emotional immaturity, social maladjustment, delinquency, self-alienation, and self-rejection. In our most recent study in this area, three criminal samples were included: juvenile incarcerents, incarcerents in a minimal security prison, and incarcertents in a maximal security prison. We again found cooperativeness to be related to a wide variety of indices of psychological health, such as emotional maturity, personal causation, social adjustment, trust in and involvement with authority figures, the control of anger, and the ability to perceive reality clearly without distorting it according to one's own desires and needs. Competitiveness is positively related to a few indices of psychological health. Positive attitudes toward individualistic efforts were significantly correlated with psychological pathology, alienation, and criminal attitudes and thought patterns. While all of this evidence is correlational, it does provide some indication of the possible long-term impact of the three types of social interdependence and points toward individualistic efforts, where students are isolated and disconnected from one another, as being the instructional strategy most potentially damaging to psychological health.

Operationalizing Cooperative Learning

Over the past twelve years there have been considerable advances in the sophistication and specificity of the operationalizations of cooperative learning situations. These procedures have been actively taught to interested teachers in both inservice and preservice situations and field tested in a wide variety of preschool, elementary, secondary, college, and adult educational settings. A conservative estimate is that over 20,000 teachers have attended workshops on the use of cooperative learning procedures. Cooperative learning procedures are widely used throughout the United States and Canada as well as in a number of other countries. There have been two major approaches to the development of cooperative learning strategies:

1. Direct application where specific curriculum packages and procedures are given to teachers to use in clearly detailed and preset ways. Some of the better known direct applications are TGT, STAD, Jig-Saw, Project Method, and Coop-Coop.
2. Conceptual application where general procedures and principles are used by teachers to formulate a set of instructional procedures uniquely tailored by the teachers for their instructional needs, circumstances, subject areas, and students. The authors of this paper have been heavily involved in training teachers how to conceptually apply cooperative learning strategies to their instructional situations.

Both of these approaches to implementing cooperative learning procedures within the schools are of value. There is, furthermore, a continual refinement of cooperative learning procedures so that new direct applications and more effective conceptual application are being implemented.

Future Directions Of Research

Four of the major problems with the previous research on cooperative learning are:

1. The lack of evidence concerning the actual interaction taking place among members of cooperative learning groups and how different aspects of the interaction influence achievement and interpersonal attraction.
2. The lack of evidence concerning the generalization of relationships developed during instructional activities to post-instructional, free-choice situations.
3. The lack of investigation of processes such as controversy that often occur within cooperative learning groups.
4. The need to focus on dependent variables other than achievement and interpersonal attraction.

For the past three years, therefore, we have been focusing our efforts on the development and refinement of a number of observation measures to examine the nature and quality of interaction among members of cooperative learning groups and relating those interaction patterns to achievement and interpersonal attraction; developing behavioral measures of interpersonal attraction among group members to measure the degree to which relationships developed during cooperative activities generalize to post-instructional, free-time situations; systematically investigating the impact of controversy among members' ideas and conclusions within cooperative groups on motivation, achievement, and interpersonal attraction; and including dependent variables other than achievement and interpersonal attraction in our studies.

In the near future researchers interested in cooperation will concentrate on these four areas, refining our understanding of the internal processes of cooperative learning groups and the interaction patterns that need to take place among collaborators in order for achievement, interpersonal attraction, positive attitudes toward subject areas, collaborative competencies, and psychological health will be promoted.

Conclusion

The use of cooperative learning strategies enables educations to "have their cake and eat it too" by simultaneously promoting high achievement, constructive student-student relationships, positive attitudes toward subject areas, continuing motivation, critical thinking, high quality reasoning strategies, cooperative competencies, and psychological health. Educations no longer have to choose between achievement and development/socialization outcomes of schooling; they can promote both simultaneously through the appropriate use of cooperative learning.

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