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ABSTRACT

Papers summarizing evaluation efforts and results from four local education agency evaluation experts and one paper summarizing selected findings from U.S. Office of Career Education sponsored demonstration projects are presented in this monograph. The first paper describes two studies of the reading and mathematics achievement of fith grade Texas students; results show that career education can make a difference in the academic achievement of students. The second paper describes the Jefferson County (Kentucky) career education demonstration project on the base methods and techniques for use with low-income students; results show that the program had an overall positive impact on reading and mathematics achievement. Summarizing findings from a three-year study of a K-12 career education program in Dade County, Florida, the third paper reports gains in career awareness during the second and third years of program installation for all elementary schools involved. Results of studies reported in the fourth paper show that among the differences between students in grades 3-12 who had high exposure to career education and those with limited exposure, there was a greater understanding of specific skills and abilities required for careers. The fifth paper summarizes several evaluation studies (from Part D of the Vocational Education Amendments of 1968, Office of Career Education demonstration projects, and National Institute of Education research projects) providing evidence of achievement in six major goals of career education. (TA)

MONOGRAPHS ON CAREER EDUCATION

CAREER EDUCATION: WHAT PROOF DO WE HAVE THAT IT WORKS?

Report of a Panel Session at the Commissioner's National Conference on Career Education, Houston, Texas November 8, 1976

by

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Phil E. Spieth, *Presenter*
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PREFACE

The promises of almost any new movement purporting to help people make better decisions generate initial societal support. In the absence of evidence of demonstrated ability to deliver on such promises, new movements tend to fade as rapidly as they began. The promises of career education were great in the beginning and did, indeed, generate much initial support and enthusiasm. The need for hard data demonstrating career education's effectiveness has been of concern to career education leaders since inception of this effort.

Among the several activities of OE's Office of Career Education to meet this need were two "mini-conferences" conducted during the 1975-76 academic year designed to elicit advice from evaluation experts interested in career education. The results of those two "mini-conferences" are found in an OCE 1976 publication entitled *Perspectives on the Problem of Evaluation in Career Education*. That publication has proven to be extremely popular.

When plans were formulated for the Commissioner's National Conference on Career Education one of the first major theme sessions identified was entitled "Career Education: What Proof Do We Have That It Works." Invited as key presenters for this theme session were four LEA evaluation experts—Dr. Phil Spieth, Dr. Frank Rapley, Dr. Richard Ruff and Dr. Elvis Arterbury—who had been participants in the OE "mini-conferences" on evaluation. Each was asked to prepare a short paper summarizing their evaluation efforts and results. To these proceedings, we asked Dr. Sidney High of OE's Office of Career Education to add a paper summarizing selected findings from OE-sponsored demonstration projects in career education. As chairperson, Dr. Lois-ellin Datta, Assistant Director of NIE's Education and Work Task Force, was selected to represent national leadership in this area.

This monograph consists of presentations made at this theme session. Because of the great interest expressed at the conference in this session and because of the obvious importance of the topic, it was decided to reproduce this set of papers as a separate OCE monograph. A shorter summary of the contents of this session can be found in the *Proceedings* of the Commissioner's National Conference on Career Education.

It is our feeling that this monograph represents an important and significant contribution to meeting the challenge of demonstrating the worth of career education. It is obviously only one step in a much longer process.

Kenneth B. Hoyt

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INTRODUCTION

Lois-ellin Datta*
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The music still lingers from the pilot segment of *Free Style*, a program intended to expand awareness of the work both men and women can do in the same way that *Sesame Street* transformed how much preschoolers learn, to their joy and ours. The pilot films, while rough-edged, never-the-less show the power of the idea. From pilot film to nationally broadcast series; from seed to shoot, bud, blossom and fruit; from demonstration programs available to a few to an integral part of education available to all—when is the evidence enough to justify the next steps?

The ideas behind career education are old. More in *Utopia* (1516) proposes that every citizen be taught the common methods of agriculture and at least one handicraft. In *Gargantua* (1530), Rabelais, intending to form an individual guided by independent reason, writes of the training of youth:

> They went likewise to see the drawing of metals or the casting of great ordnance, how the lapidaries did work, and also the gold-smiths and cutters of precious stones; nor did they omit to visit the alchemists, money-coiners, upholsterers, weavers, velvet-workers, watch-makers, looking-glass framers, printers, organ builders and other such kind of artificers, and everywhere giving them somewhat to think, did learn and consider the industry and invention of the trades.

And Andrea (*Christianopolis*, 1619) describes a universal system of education with part of each day "devoted to manual training and domestic art and science as each one's occupation is assigned according to his natural inclination." Similar proposals are found in Bacon, Descartes, Comenius, and Leibnitz.[1] Whatever else career education may be, a fad invented in 1970 it is not.

It is, however, accurate to say that systematic research on education is new, first receiving extensive Federal support in 1964-1965, and that the first career education demonstration programs were funded by the Federal Government as recently as 1971 through the Part D (Demonstration) authority of the Vocational Education Amendments of 1968.

[1] All footnotes and references, including this one, appear at the end of this paper.

About $8,000,000 yearly for three years was invested in these programs, according to the state formula grants required by the Amendments. Findings from these first projects were reviewed by McLaughlin et al. (1975), who concluded that (a) the evaluations funded as part of each project were not sufficiently rigorous to permit conclusions about program effects and (b) the programs themselves, while including instances of popular innovation, were largely add ons rather than integral parts of the public school systems. The same conclusions were reached for almost all the other projects reviewed by McLaughlin et al. (e.g., compensatory education, education for the handicapped), and were substantiated in an independent review of all research and demonstration activity supported by the Vocational Education Amendments (National Academy of Sciences, 1976). The problem of what demonstrations accomplish was endemic, then, rather than unique to the first career education demonstrations (see also the National Academy of Science report on the purpose of demonstrations, 1976).

The Education Amendments of 1974 created the Office of Career Education (OCE), with an authorization of $15,000,000 yearly for national leadership in achieving the congressional policy that:

> . . .each state and local education authority should carry out a program of career education which provides every child with the widest variety of career options which are designed to prepare each child for maximum employment and participation in our society according to his or her ability. (Section 406(a)(3), PL 93-380)

With the $10,000,000 actually appropriated for Section 406 and no formula grant restriction, the new Office of Career Education funded 80 demonstration programs in 1975. In 1976, 26 of these programs were continued and 45 new ones funded. Evaluations of these projects, in addition to the studies conducted by the National Institute of Education on experimental career education programs, and the Part D studies referred to earlier comprise the total of federally supported research on career education.[2]

The Bicentennial Commissioner's Conference on Career Education offered a national platform for stocktaking on what evaluations proved about the effectiveness of career education.[3] The OCE career education mini-conferences (1976) and the American Institutes of Research survey (1976) showed repeatedly the feasibility of career education. In villages, towns, cities and metropolitan areas across the nations, career education was happening—maybe not comprehensively, clearly not universally, probably not excellently, possibly not always recognizably, but happening. Career education was at work, these reports said, but was it working?

This question in its strong sense could not be answered in 1976 and it can not be answered in 1977. Conceptually, career education requires reform and infusion of the K through 12 system. The fair test of its' effectiveness by definition would be the long-term follow-up of graduates of good K-12 comprehensive programs. At the earliest, such data would not be available until 1988, six years after the children who might have entered a K-12 career education program in 1970 would have graduated from high school and reached the age of entry (about 25 years) to primary labor markets. It was possible, however, in November 1976 to see if career education projects were reaching their short-term objectives during the start-up years of the programs.

The papers presented at the featured symposium on "Career Education: What Proof is There That It Works?" were intended to bring such evidence together. The five presentations were selected to illustrate evaluations seen first in a close-up of two fifth-grade programs and then, through a gradually widening perspective, from the national level. The next sections of this Introduction highlight the significance of each paper and then consider the "how much is enough" question.

A Tale of Two Studies

Arterbury presents two studies of the reading and mathematics achievement of fifth-grade Texas students whose teachers had and had not participated in career education staff development sessions. The first project emphasized language arts and social studies. Following seventeen weeks of instruction, the children's reading, vocabulary, language mechanics, expression, study skills and reference skills as measured by the Comprehensive Test of Basic Skills (CTBS) showed greater gains for participating (N=226) than for non-participating (N=122) students. On comprehension, spelling and graphics subtests, the differences between groups were not statistically reliable.[4] In the second study, all fifth-grade teachers in two schools received six days of staff development on infusing career education into the mathematics curriculum. Here participating students at the beginning of the school year showed less competence in mathematics as measured by the CTBS than did the control class of all fifth-grade teachers in two other elementary schools. At the end of the school year, their rate of gain (pre/post change) was the same as that of the control students on computation, concepts and the total CTBS math score, and was higher than for control students on the applications subtest. Arterbury reports that the initially apprehensive teachers were satisfied with both the infused activities and their students' performance.

Methodologically, the study illustrates the sensitivity of control group designs and the importance of replication across teachers, schools and sites. The study also reveals some common difficulties in interpretation. The staff

development periods combined career education infusion with special training in how to teach the course content. Perhaps the technical assistance in teaching reading and mathematics alone would have led to as much improvement in the test scores. The value of career education infusion in combination with reading and mathematics staff development would be clearest if tested directly against career education training alone and staff development in reading and mathematics alone. The Arterbury study, however, appropriately joins other reports (see Bhaerman, 1977) in demonstrating that in the short-term career education fairly assuredly is not hurting the children's academic progress as some have feared, and possibly is adding motivation to basic skills know-how in improving skill acquisition.

Many Grades, Many Outcomes: A One Year Study

The Jefferson County (Kentucky) Career Education Program offers a K through 12 comprehensive model in one elementary, one junior high and one senior high school. A preprogram assessment of children's needs showed a lack of basic skills resulting cumulatively in a deficit by grade eight of more than 2½ years below grade placement when compared with national norms; limited knowledge about work and the availability of occupations; lack of career planning or the optimism to begin this, with as many as 71 percent of the eighth-graders expecting to drop-out, 62 percent having given little thought to careers, and 54 percent believing the future was dismal. Additionally, the children accepted sex and race occupational stereotypes.

Rapley found first that the program was successfully implemented even in the first year. With regard to reading and mathematics achievement, at all grades children who participated in career education (tested pre- and post-) had average post scores as high as or higher than those of the total school population (posttested only). In some instances the differences seem quite large. For example, the mean grade equivalent placement in reading at the end of the seventh-grade was 7.8 for the career education students (N=123) in comparison with 5.6 for the total population of seventh-graders (N=250, presumably exclusive of the career education students).

On tests of occupational knowledge, career concepts and self-awareness, elementary school children all reached the criterion established by school staff as reasonable, attainable yet challenging. Junior high school students did not meet criterion on occupational characteristics or preparation requirements knowledge, but exceeded criterion on exploratory experience, self-awareness and decisionmaking. Senior high school students met criterion on all areas except decisionmaking and self-awareness, yet even here 76 percent were reported to have answered more than half the items correctly.

Other observations suggested students felt greater confidence in their ability to meet their own goals, had not lowered their aspirations, or hopes for the future, and felt their education would be of use after they left school. Programmatically, the Rapley study suggests (a) that career education programs can influence a wide variety of outcomes in addition to basic skills and (b) that the programs can be effective at all grade levels.

From the viewpoint of evaluation, the study is an example of combining standardized measures, observations, local criterion-setting, and home-grown tests in a way that seems appropriate for a K through 12 comprehensive program. The study also shows the value of grouping results by grade level so the patterns of change from elementary grades through junior and senior high school can be examined. The experimental design does not permit strong inference, having been modified due to school reorganization. Rapley's approach to coping with this all-too-frequent situation may be useful to other evaluators who dwell with design circumstances beyond their control.

Trends Over Time

Summarizing findings from three years study of a K-12 career education program in Dade County, Florida (a metropolitan area with a high proportion of low-income and bilingual children), Spieth reports gains in career awareness during the second and third years of program installation for all elementary schools involved. While initially below national averages on Fadale's test of career awareness and work attitudes, students surpassed the national average at the end of the second year. Comparison of basic skills of students who had career education with students in the same school who had not showed a trend favoring career education students which was most pronounced in a school with a career-related basic skills lab.

At the junior high school level, Spieth found a trend in the second year toward reaching national norms on career knowledge and work attitudes. Basic skills achievement also tended to be higher for career exploration students on criterion-referenced language arts tests. In comparison with other Dade County schools and the state as a whole, the career exploration junior high schools surpassed the other schools in reading, mathematics and occupational information, even though the schools were in a low-income area and might have been expected to compare unfavorably.

Spieth's work suggests the value of studying effects over time, particularly the caution needed in interpreting results of the start-up period. Little is known about how long and how well a program should be implemented before summative results can be interpreted as testing the idea rather than the rough edges of change or the challenge of something new. Having a three or four or

five year perspective permits trend analysis, gives greater confidence that the results are reproducible, and offers potential adopters an estimate of how long they should expect to wait before effects are large enough and variation is small enough to be picked up as a statistically reliable change.

Implementation in Arizona

After four years of controlled evaluations in rural and urban areas of Arizona, Ruff concludes that career education is working, particularly for those who participate in high intensity programs. Among the differences between students in grades 3 to 12 who had a high exposure to career education and those with limited exposure, Ruff found a greater knowledge of the range of available occupations, awareness of educational requirements for various careers, understanding of the specific skills and abilities required for careers and a sense of what is needed for success in business and industry. Ruff also reports that career education helped the students understand the economic and life-style consequences of career choices. Of equal importance to the Arizona program, career education improved the students' sense of assurance that they could attain both their educational and occupational goals, interpreted as strengthening their self-confidence.

Among the conditions Ruff believes associated with the success of career education in Arizona are a supportive state legislature, support from business, industry and labor—in one year alone, 5,000 on-site tours involving 150,000 students were conducted—a supportive State department of education, a philosophy of evaluation stressing improvement, and enthusiastic project staff and local educators.

Methodologically, Ruff's analysis shows the need to assess independently the intensity and quality of career education programs and how to use these data to obtain more sensitive tests of the effect of real as compared to notional career education. Additionally, the study illustrates examination of the conditions apparently required for installing career education programs. While the factors may seem at first to be those essential to adoption of any innovation, the involvement of business, industry and labor is unique to career education. Since career education seems susceptible for being criticized on the one hand for being an impossible dream of educator, labor union and management collaboration or rejected on the other as being an all-too-possible nightmare of an educational takeover, Ruff's examination of these institutional processes is a useful model of how evaluations can contribute to national policy debates as well as to program improvement.

Comparing career education in 1976 with the early bicycle mechanic flying machines, High comments that although the first planes didn't fly very far, go very fast, or stay aloft very long, they proved that power-driven heavier-than-aircraft could fly. Summarizing evaluation studies from Part D, OCE and NIE demonstrations, High concludes that as assessed through rigorous evaluations, some career education programs aren't off the ground but "there is increasing evidence that some of them fly." He then selects evaluations showing positive effects to illustrate what outcomes are possible.

The positive effects come mainly from a few controlled studies such as Olson's 1974 evaluation of elementary school career education in Lincoln County, W.Va., where data are reported on an array of outcomes for participating (N=240) and non-participating (N=205) students selected at random from larger groups of participants and non-participants. Other frequently cited studies are the Pima and Cochise school systems in Arizona (*vide* Ruff) and the Newark, N.J. evaluation. For each of the six outcomes, there are, however, studies in addition to these four in which evidence of achieving the goal is found. As reviewed by High, three studies show evidence of improved academic skills; five of improved work values, four of improved career decision-making skills, two report improved occupational and interpersonal skills; 14 studies gave evidence of greater knowledge of educational and vocational opportunities; and one study found students increase in the sense of control over their own lives.[5]

The evidence would not overwhelm a determined skeptic. Several studies, as already noted, are cited as evidence for more than one goal, one site (Lincoln, W.Va.) is reported in two separate studies (Olson and Developmental Associates); and few if any of the evaluations could not be picked at by dedicated underminers. Nonetheless, for those inclined to see things half-full rather than half-empty, High has brought together enough of the early flying machines, tried out with diverse populations in different settings, to show that for all the major goals of career education, at least one program is indeed off the ground.

Methodologically, High's paper usefully demonstrates the ways in which the short-term outcomes of career education have been measured. Many of the evaluations have used standard measures of achievement and occupational knowledge Some have applied instruments intended for individual counseling to assess group changes. Still others have created new techniques. For example, in one imaginative study conducted by Rochow in Pontiac, Michigan, 60 students (30 who had received special instruction in job-getting skills and 30 matched controls) were interviewed by corporate personnel hiring managers

asked to select which students they would hire. Of those selected, nine out of ten were from the experimental group, a selection rate reliably higher than those for the controls.

How Much Evidence Is Enough?

Enough, it may be asked, for what? There are three possible next steps for career education. One step would be backward in reduced support. Presumably this would be taken if the goals are unattractive, the side-effects undesirable, the programs infeasible or too costly, the approaches ineffective, or because no further support is needed for infusion of an attractive idea. Another step might be continued support for research, experimentation, demonstration and general leadership activities. This probably would happen if the goals are attractive, the side effects not undesirable, and there is sufficient enthusiasm for the idea but insufficient evidence for the feasibility and effectiveness of career education or of the necessity for additional support. Still another step might be increased support to expand or improve career education programs. Presumably this would happen if the goals are compellingly important, the side effects minimal, the programs feasible and affordable, the approaches effective, and legislators convinced that further support is necessary to achieve the public policy stated in Section 406 of PL 93-380.

There are at least four factors influencing the impact on these next steps of the proof that career education works: selecting positive instances, the short-term nature of the studies, claims versus fears, and what the Congressional Research Service describes in their analysis of evaluations and oversight studies generally as dismay at the "robust expenditures for research and evaluation in disturbing contrast to the anemic set of conclusive and reliable findings" (1976, p. 562).

- Accentuating the Positive

The symposium was intended to prove that for all the major outcomes of career education, at least one program worked. For this purpose, one doesn't need a comprehensive review of all career education evaluations and accentuating the positive is an appropriate basis for argument so long as one has not eliminated the negative, concealing evidence that programs hurt children, which would be rather like arguing for a new pill from the one survivor rather than from the nine fatalities. In this instance, High and other reviewers have searched for the negatives and found them extremely rare, such as one experimental/control difference slightly favoring the controls on one subtest in comparison to scores of positive or neutral results.

It should be emphasized, however, that proving career education can work for at least one and usually several instances is not the same as assessing the time, effort and other resources required to achieve effectiveness in all programs, in all sites, on all outcomes. That is an important question for national policy, but a different symposium.

- Long-term/Short-term

Conceptually, the major effects of career education should be expected only after participation in K-12, well-implemented programs and not until after the participants have reached the age of entry into primary labor markets, although studies of the transition process would certainly be relevant. The data presented here at best could be considered cross-sectional. None include follow-up after high school graduation. While cross-sectional evaluations in many circumstances are considered quite reasonable approximations for true longitudinal studies, this is not one of these circumstances.

The consequences of using short-term data may be to underestimate the long-term effects of career education. Recent studies suggest some educational interventions may show increasing effects over time, as if two non-parallel lines that were relatively close at point of origin show an increasing absolute size of the gap with distance and time. Particularly where the skills or attitudes developed may not be directly tested or used until later years, short term studies may fail to show the effects actually obtained.

The studies cited in the symposium show reasonably large and reliable short-term benefits and no short-term harm, an encouraging finding if the extrapolation argument is persuasive. It may be argued that prudent policy will forgo a national long-term benefit not at any event now enjoyed by the public until the long-term consequences and alternative solutions have been fully explored. Perhaps, however, there are no solutions to some problems, only the adjustments each generation makes as well and as widely as it can to the situations confronting it.

- Unique Claims versus General Fears

Critics and advocates of career education sometimes seem to be speaking past each other in evidence cited to support their points. Advocates tend to cite evidence that specific programs are achieving the unique objectives of career education which are not disputed anyhow by critics. For example, few critics would object to young people having a better knowledge of themselves and of work. Critics of career education tend to worry about such issues as whether real collaboration among management, organized labor and organized education is possible, whether career education will track low-income and

minority youth away from higher education by presenting gloomy information about the value of advanced degrees; and whether the work values and attitudes promoted through career education are those of wage slavery or enlightened understanding of the complexity of working life.

The evidence presented in the symposium does speak to one issue which is common ground for advocates and critics: whether career education detracts from or adds to acquisition of basic skills. The evidence generally does not speak as clearly to the other debated issues.

Those who focus on whether career education is achieving its own objectives may find this evidence more useful as grounds for deciding on the next steps, then, than those concerned with other issues. However, my own review of some debated issues (Datta, 1977) suggests that, with one exception, the evidence is fairly consistent with the advocates of career education; critics might be called upon to present their counter-evidence about career education rather than simply describing their maybe-this-would-happen anxieties about vocational education.

- Evaluation, Evaluation

This seems to be a time of skepticism about evaluations as bases for policy-decisions, a period hastened from within the profession by those world-weary from both evaluations and social interventions, and from without by some policy-makers exasperated at the intensive criticism greeting almost every evaluation study, whatever its' news (see, e.g., Congressional hearings on legislative oversight and evaluation, May 1976).

Other evaluators and legislators are grappling with how to sail between the Scylla of local evaluations with their lack of generalizability, too amiable standards of success, easily uprooted designs, and pressures for the cloak of a favorable report, and the Charybdis of massive studies with their insensitivity to process and to unique outcomes, lack of control over slippery innovations, influences of expediency and pork-barrel on site selection which impairs the designs needed for strong inferences, and Iron Maiden statistical analyses.

The Education Amendments of 1974 required Title I of the Elementary and Secondary Education Act to provide regional technical-assistance centers with whose help LEAs would apply common evaluation designs, permitting local adaptation yet cumulation of findings. The Office of Career Education through its evaluation guidance, technical assistance and evaluation handbooks is moving in a voluntary but similar direction. The Office of Child Development, through the Education Commission of the States, is capitalizing on the 1960s experimental early childhood education programs in a long-term followup

using common designs and measures. The Vocational Education Amendments of 1976 in a landmark provision (Section 212) specified congressionally intended outcomes to be reported yearly, thus reducing one bone of evaluation contention. The Act also mandated the third in a series of pioneering long-term national studies of the issues underlying legislative decisions. But the benefits of these changes lie somewhat in the future, and added to present concern about evaluation is resistance to educational change, however the results fall, perhaps as a reaction to a decade of such unprecedented experimentation that schools seemed like Thucydides' river, never the same from second to second.

- Whither?

In such circumstances, what can be expected from still another set of evaluations on still another group of demonstrations? To my mind, this depends on how much certainty decision-makers and the public want. Imperfect as they are, early evaluations of career education programs are providing convincing evidence that short-term objectives related to the long-term goals can be achieved in some programs, and there is little or no short-term evidence of the harm anticipated by those fearing the utilitarian in education.

It seems likely that the answer to how much evidence is enough for which next steps may depend less on how many career education programs unequivocally reach their short-term objectives, useful as this information is for sharpening public debate, and more on consideration of the goals themselves. How many of the goals of career education does the public see as the adjustment this generation will make to opportunities and problems confronting us? These are matters of value beyond evaluation as a discipline. Research can show what can be accomplished and the probable consequences of different actions, but in our society, it is confluence of diverse public interests which will determine how much importance we place on helping youth "see the drawing of metals or the casting of great ordnance, and how the lapidaries did work. . .to think, learn and consider" in comparison with the other demands on public attention.

FOOTNOTES

*Opinions are the author's. Endorsement by the National Institute of Education should not be inferred.

[1] These quotes and citations are paraphrased from Artz (1966), pp. 1-18.

[2] Career education is at times described as a lavishly funded Federal activity. Little if any money has gone for direct program support. The funds, relatively small on the Federal scale, have gone to demonstrations, experimental projects and leadership activities.

[3] There are several summaries of career education evaluations. In addition to McLaughlin et al. (1975), reviews have been prepared by Arterbury (1977), Herr (1977), Bhaerman (1977) and Bonnet (1977). The National Advisory Council on Career Education has commissioned a series of reports which often include analyses of the research literature. There are, in addition, critiques of career education such as Grubb (1975, 1977) and McGowan and Cohen (1977). These tend to be theoretical rather than empirical, drawing on vocational education studies or personal experiences when data are cited.

[4] Evaluators tend to conclude an effect is shown if observed differences between groups are statistically reliable. Since statistical reliability reflects the size of the sample and the variability of the groups as well as the magnitude of the difference, a more informative criterion would be educational meaningfulness as well as statistical reliability. The studies in the symposium use statistical reliability as the only criterion, a common feature which is not to be mentioned separately for each presentation.

[5] A comprehensive survey of recent career education reports (Bonnet, 1977) has increased the number of examples in each category but shows roughly the same proportion of studies in the different areas.

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CAREER EDUCATION: TWO STUDIES OF EFFECTIVENESS AT THE FIFTH-GRADE LEVEL

by

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It is both a pleasure and an honor for me to be here today. I am grateful to Dr. T. S. Hancock, Chairman of the Commissioner's National Conference on Career Education, for the invitation to serve on this panel of distinguished individuals: Dr. Lois Datta of the National Institute of Education, Dr. Sidney High of the Office of Career Education, Dr. Richard Ruff of Arizona, Dr. Frank Rapley of Kentucky and Dr. Phillip Spieth of Florida.

My presentation is taken from the report entitled *Career Education and Academic Achievement in the Elementary School.* This report is based upon two separate studies. Study I, "Career Education and Academic Achievement in Language Arts and Social Studies," was a joint effort of Education Service Center Region XI and the Partners in Career Education project. All of the activities for Study I were supervised and directed by Dr. Rita Bryant of the Partners staff. Study II, "Career Education and Academic Achievement in Mathematics," was also a cooperative effort of the Education Service Center Region XI and the Partners project. Both studies were for the purpose of demonstrating the effectiveness of the career education infusion process in classrooms at the fifth-grade level.

INTRODUCTION

Career education seeks to improve the teaching-learning process through the infusion of concepts into the existing school curriculum which are designed to develop in students the attitudes, behaviors and skills that are necessary for success in the world of work. This infusion technique helps students to comprehend the relationship between the material being taught in every classroom and the world outside of school and better prepares them for planning their future activities.

Partners in Career Education has developed products and processes designed to aid classroom teachers in the infusion of career education concepts, called *Basic Learner Outcomes for Career Education,* into existing curriculums. Working

in cooperation with the Texas Education Agency, the Partners' project designed a unique staff development-curriculum writing process, demonstrated its effectiveness by trying it out with a large number of teachers in workshop situations, and produced classroom usable learning modules. This staff development process introduces classroom teachers to the concept of career education and to the basic learner outcomes. Teachers are presented with sample modules and instructed in methods for infusing career education concepts into their curriculum. Student development in terms of the basic learner outcomes has been conceptualized as a sequential process that will enhance student development in existing curriculum areas.

In two separate studies, Partners in Career Education and Education Service Center Region XI cooperated in demonstrating the effectiveness of the career education infusion process at the classroom level. Selected fifth-grade classes were involved in these studies, the teachers participated in career education staff development sessions and student achievement was measured using standardized achievement tests.

STUDY I

Career Education and Academic Achievement in Language Arts and Social Studies

During the 1974-75 school year Education Service Center Region XI conducted a series of six workshops for school districts interested in implementing career education. Consultants from Maryland's Prince George's County Public Schools and Partners in Career Education conducted staff development workshops and provided curriculum materials. School districts participating in the workshops included Everman, Crowley, Birdville, Arlington, Cleburne, South Lake and Hurst-Euless-Bedford.

Fifth-grade teachers from four elementary schools were selected to participate in the research study. These teachers were from Rankin Elementary, Arlington; Shady Oaks Elementary, Hurst-Euless-Bedford; Coleman Elementary, Cleburne; and Carrol Elementary, South Lake. Students were tested for control purposes at Berry Elementary, Arlington; Bell Manor, Hurst-Euless-Bedford; Cooke Elementary, Cleburne; and Paradise Elementary, Paradise. Two hundred twenty-six students were involved in the experimental fifth-grade classrooms and one hundred twenty-two students were in the control classrooms. All of the students were pretested utilizing the *Comprehensive Test of Basic Skills* (CTBS). The teachers from the experimental classrooms participated in career education staff development sessions. Special emphasis was placed on language arts and social studies. Following

approximately seventeen weeks of instruction the students were posttested utilizing the CTBS. To avoid a possible testing effect, students were pretested with Form Q of the CTBS and posttested with Form R.

Analysis of covariance was utilized for statistical purposes. The results of the testing showed statistically significant results favoring the experimental group on the subtests reading-vocabulary, language-mechanics and expression, and study skills-reference. Statistically significant results were also obtained on total reading scores, total language scores and on the total CTBS battery. Regression on some of the scores could be due to the different forms of the tests. Both groups showed some regression but the experimental group was consistently less. Table I, on page 18, presents the results of the testing.

STUDY II

Career Education and Academic Achievement in Mathematics

Because of the positive results shown by Study I, Birdville Independent School District personnel expressed interest in utilizing the career education infusion process in the mathematics curriculum during the 1975-76 school year. All of fifth-grade students in two of the district's elementary schools (Grace Hardeman and South Birdville) were selected to provide the experimental group, all of the fifth-grade students in two elementary schools (West Birdville and Browning Heights) were selected to provide the control group. Staff development activities were directed and conducted by consultant staff members from Birdville Independent School District, Partners in Career Education and Education Service Center Region XI. Six staff development days were set aside for the teacher-participants in the experimental classroom.

The mathematics portion of the CTBS, Form Q, was administered as a pretest to the students in both the experimental and control groups in September, 1975. Analysis of the pretest data indicated that the mean scores of the control group were higher than those of the experimental group. Teachers in the experimental schools expressed concern because their students were typically lower achievers than the students in the control group classrooms. Even though these groups were not accurately matched in terms of mathematics achievement the study continued.

Six teachers from the two experimental schools participated in the special staff development sessions. During these sessions the teachers received a thorough orientation to career education and the infusion process. Films and commercial materials provided by Education Service Center Region XI were reviewed. At each session plans were made for classroom activities to be used in infusing career education into the teachers' lesson plans. Reports as to the

TABLE I

Mean scores and degree of change on pre- and posttest for experimental and control groups on Reading, Language, Study Skills, subtests and Total Battery, *Comprehensive Test of Basic Skills*

	Total Battery		Reading Total		Vocabulary	
	$\bar{X}$	Δ	$\bar{X}$	Δ	$\bar{X}$	Δ
Experimental (N=226)						
Pre-	172.21		56.28		27.19	
Post-	182.78	10.57	56.11	−.17	27.14	−.05
Control (N=122)						
Pre-	161.95		53.06		26.02	
Post-	164.28	2.33	49.98	−3.08	23.13	−2.89
Significance Level (P)	.001		.01		.001	
	Comprehension		Language Total		Mechanics	
Experimental						
Pre-	28.18		52.91		16.14	
Post-	28.98	.80	59.37	6.46	19.54	3.40
Control						
Pre-	27.04		51.43		15.81	
Post-	26.85	−.19	53.46	2.03	16.93	1.12
Significance Level (P)	N.S.		.001		.001	
	Expression		Spelling			
Experimental						
Pre-	17.60		19.32			
Post-	20.43	2.83	19.40	.08		
Control						
Pre-	17.50		18.12			
Post-	13.38	.88	18.15	.03		
Significance Level (P)	.001		N.S.			
	Study Skills		Reference		Graphics	
Experimental						
Pre-	30.94		10.98		19.95	
Post-	35.01	4.07	13.60	2.62	21.41	1.46
Control						
Pre-	29.79		10.97		18.82	
Post-	31.84	2.05	12.08	1.11	19.75	.93
Significance Level (P)	.01		.001		N.S.	

success of activities already tried out were made at follow-on sessions. Through this process ideas were shared and needed support materials provided by the consultants. At the conclusion of the study the Birdville district and the service center arranged for the participating teachers to visit the Sulfur Springs Independent School District to observe an on-going career education program in one of the district's schools.

In both the experimental and control groups students were posttested in March, 1976, with CTBS, Form R, to assess their development in mathematics skills. Analysis of covariance was utilized for statistical purposes. Even though the pretest scores indicated that the groups were not matched the pre- and posttest mean score differences recorded by the experimental group were higher than for the control group and a statistically significant difference between the two groups existed in the subtest mathematics-application. Table II presents the mean scores on the CTBS for the groups tested.

TABLE II

Mean scores and degree of change on pre- and posttest scores for experimental and control groups on mathematic achievement, *Comprehensive Test of Basic Skills* (CTBS).

	Computation		Application		Concepts		Total	
	$\bar{X}$	Δ	$\bar{X}$	Δ	$\bar{X}$	Δ	$\bar{X}$	Δ
Experimental								
Pre-	21.4		8.5		14.6		44.5	
Post-	30.6	9.2	10.6	2.1	17.6	3.0	58.9	14.4
N=118								
Control								
Pre-	26.3		10.4		16.8		53.5	
Post-	33.7	7.4	10.9	.5	18.9	2.1	63.4	9.9
N=154								
Significance Level	N.S.		.01		N.S.		N.S.	

CONCLUSIONS

The two studies presented in this report were not conducted according to rigorous research designed criteria. However, insofar as possible acceptable research procedures were followed. Primary emphasis was placed upon career education infusion techniques throughout the program. The results of these studies reaffirm the belief that career education can make a difference in the academic achievement of students. Student achievement during these studies is attributed to the support provided by the school districts involved and to the special efforts of the classroom teachers. This particular approach might not

prove to be practical for an entire school district, but similar small scale efforts should produce similar positive results.

The methodology employed for infusing career education concepts into existing curriculum areas should help to allay the fears expressed by many educators regarding career education implementation. Students in the experimental group progressed at a rate equal to or greater than those students in the control group in every academic area tested. This fact is particularly significant for the Birdville study (Study II). Students identified as being lower achievers by both the teachers and by test scores achieved math skills as measured by the tests at a greater rate than the higher achieving control group. The teachers indicated satisfaction with infused activities as well as the results achieved by their students.

EVALUATION OF A CAREER EDUCATION PROJECT IN JEFFERSON COUNTY, KENTUCKY

by

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The Jefferson County Career Education Program is a demonstration project of the best methods and techniques for use with low-income youngsters. It is a K-12 comprehensive model for Career Education which contains all of the elements you who are in attendance know so well. It is being implemented in one elementary, one junior high, and one senior high school.

This is a small project compared to others which may be reported this week but it is important for that reason. It is the view from the bottom of the education structure but the heart of the educational process—the local school. Hopefully, it's where it's happening.

Project staff identified several needs relating to low-income students and planned the project around these needs. In order to understand the outcome data more completely, I am going to mention just a few of these needs.

1. Lack of basic skills:

   Reading and math scores in these schools are among the lowest in the district. Typically, youngsters in grades 2-8 made no more than .6—.7 grade equivalent years progress each year which resulted in a cumulative deficit by grade 8 of more than 2½ years below grade placement when compared to national norms.

2. Lack of knowledge about the world of work and the availability of occupations.

3. Limited information concerning career decisionmaking and the relationship between education and the world of work:

   From a sample of eighth-graders taking the Assessment of Career Development in 1975 only 29 percent planned to finish school; 62 percent had given no thought to a possible job choice; and 54 percent believed that the job future was "dark."

4. An acceptance of traditional sex and race stereotypes regarding worker roles.

The evaluation plan tried to sample the knowledge, behavior, and attitudes in these and other areas under six general objective groups:

1. Knowledge of occupations and job clusters,
2. Knowledge of career concepts,
3. Decisionmaking skills and career planning,
4. Self-awareness,
5. Basic skills and relevancy, and
6. Work habits.

Obviously we were looking at short-term outcomes that we could describe for the project year in question.

I think that it is also important to note that this project was being implemented concurrently with a systemwide desegregation plan that affected every school in the district in one way or another. Consequently, some of the comparative data and statistical tests we had planned to conduct were rescheduled for the following year as pretesting was not feasible.

Instead, each objective for learners was operationally defined by stating that a certain proportion of the group would reach a stated criterion on the instruments matched to that objective. (Examples. 51/60, 60/65, 70/60, that is, 51 percent of the group would answer correctly or respond positively to 60 percent of the items.) Objectives were set which were reasonable and attainable, yet challenging in the judgment of project staff, based on prior data and experience in similar schools. We have a lot of data – much of it has already been used to identify strengths and weaknesses, and for revision of this year's program.

A few of the results organized by objective group follows.

There is a lot of overlap between the categories identified and you may not always agree with the placement, as we used item data as often as scale data to examine results.

I. Knowledge of Occupations/Job Clusters		51/60 Criterion
Grade Level	*Instrumentation*	*Results*
Grades 1-6	Minnesota Cognitive Questionnaire University of Minnesota	All reached criterion.
Grades 8-9	Assessment of Career Development Houghton-Mifflin	Did not meet criterion on occupation characteristics or preparation requirements but far exceeded criterion on exploratory experience and relation to job clusters.
Grades 9-12	Assessment of Career Development Houghton-Mifflin	Met criterion in all areas.
II. Career Concepts		65/60 criterion
Grades K-12	Valuing Post Course Education Development Corporation	Only K-2 and 10-11 reached criterion on all parts. Three-six did not reach the objective; 7-8 achieved the objective on only parts of the scale.
III. Decisionmaking) IV. Self-awareness)	Different decision rules for instruments and various scales and tables for these two goal areas.	
Grades 7-11	Post Course Self-image Inventory Education Development Corporation	Criterion was met.
Grades 10-11	Career Maturity Inventory Houghton-Mifflin	51/51 Seventy-six percent answered more than half the items correctly.

Grade Level	*Instrumentation*	*Results*
Grades 7-11	Assessment of Career Development Houghton-Mifflin	After making a first and second job choice which ranged over all possible choices and did not appear to be a programmed choice as some have suggested, youngsters responded favorable on items indicating: 1. confidence in job's ability to meet life's goals, 2. one's own capacity to adapt to the job, and 3. whether one's job future was "bright." Lowered aspirations would not appear to be an outcome of this project.

V. Basic skills:

Merger and desegregation forced the biggest change here. All youngsters were tested with the '73 Stanford Achievement Test (SAT) or Test of Academic Skills (TASK) and regression discrepancy methods will be used to look at gains during this project year. We do have test data on all project youngsters.

Relevance	"Home Made"	More than 80 percent of all responding at all levels gave positive answers on relating education as a meaningful preparation for a career.
Work Habits	"Home Made"	More than 91 percent were able to identify desirable work habits as related to school in grades 7-11.

The Research Department of the Jefferson County Public Schools has been able to examine a sample of youngsters in each grade who had both pretest and posttest information. The following is a summary of the results of this analysis.

The Stanford Achievement Test was administered to a sample of children in each school in January 1976 and all students were tested as part of the systemwide achievement testing program in May 1976.

Initially it was planned to evaluate the achievement results by using regression equations to predict May scores based on the previous year's data for the same children. However, it was decided to develop a new testing program in the merged Jefferson County District and, therefore, the old regression equation would no longer be valid. Beginning in 1976-77, however, it will again be possible to do these regressions since two years of Stanford data will be available.

Table 1 presents pre- and posttest reading total data for the students who were pre-tested. Similar data for the total mathematics battery are presented in Table 2. Table 3 gives posttest results for the total school population. Grades 1-8 are in grade equivalents while 9-11 are in percentile ranks.

TABLE 1

Pre- And Posttest Reading Means

Grade	January Pretest	May Posttest	Gain	Number Tested
1	–	–	–	–
2	1.3	2.4	1.1	33
3	1.3	3.2	1.9	43
4	4.0	5.3	1.3	19
5	4.1	5.6	1.6	18
6	5.6	6.3	.7	36
7	5.0	6.2	1.2	123
8	7.2	7.8	.6	111
9	10	26	16	223
10	68	55	-13	267
11	46	58	12	252

TABLE II

Pre- And Posttest Mathematics Means

Grade	January Pre-Test	May Post-Test	Gain	Number Tested
1	–	–	–	–
2	–	–	–	–
3	3.5	3.7	.2	43
4	3.9	5.2	1.3	19
5	5.3	6.5	1.2	18
6	5.8	6.7	.9	35
7	4.6	6.0	1.4	114
8	7.3	7.3	0	108
9	1	32	31	198
10	50	46	–4	239
11	30	60	30	222

TABLE III

Posttest Reading and Math Data for the Total School

Grade	Reading	Math	Number Tested
1	1.3	1.5	199
2	2.3	2.6	80
3	3.2	3.5	72
4	3.9	4.1	76
5	4.6	5.6	69
6	5.2	5.8	112
7	5.6	5.7	250
8	6.6	6.5	241
9	24	32	265
10	44	40	342
11	54	60	318

Though the number of students tested was, in some cases, not very large, the general trend is quite obvious:

There were sizable gains in most grades, probably larger than would be expected in the short interval between the testing.

We lack sufficient information, not having baseline data or regression equations to conclusively attribute the results to the program, however, the pattern of results is very consistent across schools and grades. Too, the process information gathered throughout the year gives strong evidence that the program was well-implemented. We feel, therefore, that there is a strong probability that the Career Education Program (perhaps in combination with other instructional programs in these schools) had an overall positive impact on both reading and mathematics achievement.

EVALUATION OF CAREER EDUCATION IN DADE COUNTY PUBLIC SCHOOLS MIAMI, FLORIDA

by

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This paper presents a description of a K-12 Career Education Program which has been implemented in a large metropolitan area, and an evaluation of the effects which the program appears to be producing on students who have participated in it.

Dade County Public Schools (Miami, Florida) have been piloting a program which consists of a Career Awareness component at the K-6 elementary school level, a Career Exploratory phase at the junior high school grades of 7-9, and a more traditional vocational education element in the high schools. Now into its fourth year, the program has witnessed an expansion from a preliminary pilot phase of one elementary, one junior high, and one senior high school implementation level to that of several schools currently participating in these components.

Evaluation of the program has been directed towards determining probable potentials of a student's participation in it. The ultimate evaluation, of course, would be to determine that such participation leads to a rationally selected occupation (skilled, technical or professional) for which the aspirant has been adequately trained and from which personal fulfillment and societal productivity are realized. For a number of reasons, including the relatively short duration of career education's history in Dade County, this ultimate evaluation has not been and perhaps may never be possible.

Instead, more indirect approaches have been necessary. The arsenal of evaluation techniques necessary to substitute for the ideal evaluation have included (1) the assessment of knowledge that one gains about careers and career clusters,[1] (2) the documentation of altered attitudes towards work, the work world and the school experience, and (3) the measurement of growth in

[1] All footnotes and references, including this one, appear at the end of this paper.

the basic skills (reading and mathematics) which derives from students' career education involvement.

Dade's Career Education Program

These approaches to evaluation have been carried out for the various levels of Dade's career education model. The model at the elementary school level, entitled *Career Awareness,* consists of three major formal components: a) a Career Awareness Laboratory, b) Career-Related Basic Skills Laboratories in Reading or Mathematics, and c) Career Resource Centers.

Career Awareness Labs are locations about equivalent to two regular classrooms in size, in which "hardware" associated with various occupations is congregated in individual, career-cluster stations. Students spend time individually, at each station, reading about the nature and requirements of various occupations contained within the cluster represented by that station. The stations have one or more pieces of equipment associated with the cluster, which students must read how to assemble or operate in order to perform a specific occupational task. They perform the appropriate "hands-on" activity and partake of the other career stations in subsequent days in the laboratory.

The Career-Related Basic Skills Laboratories are also school areas set apart from the child's regular classroom. These, however, are visited for a period each day for basic skills instruction. Unlike traditional basic skills instruction, the abstract qualities of the curriculums are modified to represent real career-related concepts so that the pupil's motivation for learning basic skills is enhanced by his/her supposed interest in deciding on what to become as an adult. Instruction is, hopefully, more personally interesting in this method, so students are assumed to be able to improve their basic skills more than in the traditional vein since the instruction is more relevant.

The third Career Awareness component, a Career Resource Center, is established in the elementary school to serve as the information depot concerning career education materials and literature. Operated by a full-time teacher's aide, these centers check out such materials to regular classroom teachers for use in their classrooms, provide information to individual pupils visiting the centers, and disseminate literature to other nearby schools for benefits outside the home campus.

In addition to these formal Career Awareness components, the program also has an informal infusion of career education concepts into the regular school curriculums. Increasingly, social sciences and language arts curriculums are being modified to contain overt and subtle career awareness elements.

In Dade junior high schools, a *Career Exploration* program is implemented. This is similar, in practice, to the elementary program in that it contains the same formal and informal components as Career Awareness. It differs, in concept, in that its intent is to provide more in-depth "hands-on" experiences with the actual implements required in various occupations, rather than simply making the pupil "aware" of various careers.

The senior high program is entitled *Career Specialization;* it is a further refinement of the Career Exploration level which addresses itself to the provision of skills sufficient to enter and maintain one's chosen occupation.

While the senior high school level of the program has existed many years (as a traditional adult and vocational education program), Career Awareness and Career Exploration have only been implemented for three years, and are still in somewhat of a pilot phase in Dade County.[2]

The Nature of the Evaluation

Dade County Public Schools has a Planning and Evaluation Department which has as one of its functions, the evaluation of pilot programs prior to their adoptions on a countywide basis. Located in the school district's Finance Division, the department is independent of divisions associated with program development and/or implementation, so that some objectivity concerning program operations may be retained.

This department has conducted evaluations in each of the three pilot phase years of career education. The first effort was a very simple process evaluation of the degree and nature of implementation that was taking place, and is not reported in this paper.

A more complex design, directed at determining some of the probable outcomes of career education, was instituted during the second year and was modified for continuation into the third year evaluation. In these latter two evaluations, information was gathered and analyzed concerning whether or not students taking the Dade Career Education Program (1) increased their knowledge of careers, (2) improved their attitudes towards identifying and selecting a job; towards the work world; and/or towards school, and (3) increased their arithmetical and reading skills.

The evaluation during the second year phase (1974-75) consisted of identifying the students in six elementary schools and three junior high schools who were to become career education participants during the year. As much as possible, the students were chosen randomly for introduction to the program.

Their gains in career knowledge were then able to be compared to other pupils within the same schools who had not yet entered the program.

The third year evaluation was essentially a continuation of the design introduced during the second evaluation. The students who had participated in the second year study were re-evaluated with the same instruments to see the degree to which trends in basic skills improvement and/or career knowledge and attitudes were being maintained or enhanced by program involvement.

The question of whether or not the education process itself, i.e., the procedures by which teachers instruct, might be altering as a consequence of more appropriately meeting total student needs was explored as an additional area of the third evaluation. This question was raised because it was conjectured that less formal instructional practices, such as the discussion approach, might be possibly utilized to teach in a situation in which the students were more satisfied with the curricular content.

Instruments used to decide whether gains were being made included career awareness tests, attitudes towards careers and the work environment instrumentation, and achievement tests to assess basic skills assimilation. Several norm-referenced[3] instruments have been designed to assess students' cognizance of career information. Two were selected[4] for usage in the Dade County evaluation - one each at the elementary and junior high school levels. The two instruments each contain several subtests for assessment of related but different aspects of career education.

The particular achievement tests used included norm-referenced instruments,[5] criterion-referenced tests,[6] and locally developed course content tests administered to junior high school Career Exploratory Program participants.[7]

Summary of Major Findings

Detailed results of the third-year evaluation, as well as a summary of the second evaluation, appear in Educational Resources Information Center (ERIC) in a report entitled *Evaluation of Dade County Public School Career Education Program, 1975-76* (ED 129 896).

The results presented in that report indicated the following:

1. For Dade students in the elementary school Career Awareness program, a pronounced school/program effect was apparent. Although overall gains were made in career awareness and attitudes toward the work world, these results were especially characteristic of some schools whereas other schools demonstrated little or no gains from their particular programs.

2. These differential effects between elementary schools could not be related to several variables investigated. For example, socio-economic status level of the various schools did not appear to determine whether or not a given program was likely to be successful. The numbers of various program components provided by the school, i.e., whether a school had all three components. Career Awareness Labs, Career-Related Basic Skills Labs; and Career Resource Centers or one or two of these components, did not impact the school's total program effect. Similarly, neither the size of the student population nor it's ethnic constituencies were variables which related to program effectiveness in the schools.

3. The only variable discovered to have some relationship to program effectiveness was the length of time a school had been offering career education. Schools which had operated their career programs for longer durations tended to have more significant program impact - this was true of both elementary and junior high schools.

4. The gains which were apparent across all elementary schools are shown in Figure 1. The September 1974, and the February 1975, results are the pretest and posttest scores attained by the Date Career Awareness populations during the second evaluation. Results shown as February 1976, were obtained from the same population one year later, as part of the third career education evaluation.

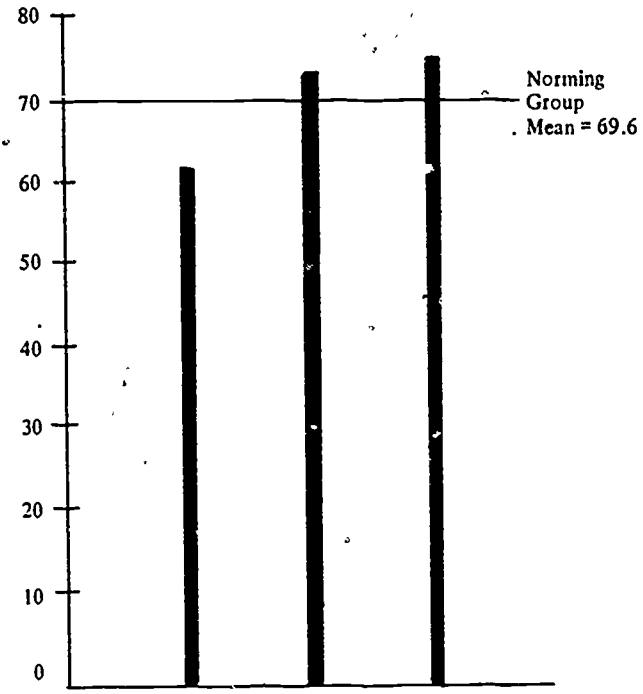
It is evident in this figure that, prior to their introduction to Career Awareness (September 1974), the Dade pupils were beneath the national norm on Fadale's career awareness and work attitude skills. Apparently, as a consequence of program involvement, the students surpassed the normative test levels later in that school year and continued their trend of improvement into the next year.

5 Basic skills achievement - in particular mathematics reasoning and computation skills were assessed for students of career education and compared to attainments by pupils in the same schools who had not yet experienced career education. Although differences between these two groups were not pronounced, larger gains over a six-month period were posted for the career awareness participants. These gains were especially pronounced in a school which had stressed the use of the Career-Related Basic Skills Laboratories.

6. Junior high school results during the first year that career exploration benefits were assessed were less clear-cut than elementary school outcomes. To a large extent, there were not program effects being consistently realized during this initial assessment phase. Any differences noted in either the achievement or career knowledge/attitude measurements between career

FIGURE 1

Career Awareness Inventory (Fadale)
Total Mean Raw Score Comparisons for the Pilot
Elementary School Level Career Awareness Program Participants



education and non-career education pupils typically were more related to the particular school attended than to inclusion in the program.

Students scored below national norms on the career knowledge and work attitude measurements before introduction to career exploration and, by and large, remained there after initiating the program.

7. The second year in the junior high school program did, however, begin to produce positive results. A slight trend of gains being made on normative levels of the career knowledge attitude test was noticed, and basic skills achievement was evident for program participants.

8. The basic skills achievement was evident in differing test situations. One carefully controlled study was made of the gains realized in the State assessment of language arts criterion-referenced items. One group, a sample of students about to enter infused Career-Related Basic Skills Laboratories in the junior high schools piloting career education, was compared to another group of identically achieving pupils in the same schools at a point seven months later on the items of the Florida Ninth-Grade State Assessment Test. While the differences between groups were not great at each of the schools, the career exploratory students at each of the schools did achieve more correct items than the non-career education counterparts. This can be seen in Figure 2.

9 The State eighth-grade test is a norm-referenced assessment of basic skills, occupational knowledge and school attitudes. Figure 3 shows how the career education schools (e 'led Pilot and Comprehensive School Dade Career Exploration Students–Grade 8) compared to other Dade County schools and to the State as a whole, in reading, mathematics and occupational knowledge. Although the career exploration schools were generally from fairly low socio-economic levels (in terms of a statewide average) and might, therefore, have been expected to have compared unfavorably to other schools' achievement levels, the career exploration schools surpassed other Dade schools in reading and occupational information, and they surpassed both the other Dade schools and the average statewide levels, as well, in mathematics.

These results were being achieved in less than two years of career education program inclusions in the participating schools' curriculums. In fact, two of the five participating schools were totally new buildings that had opened during the year that the study was conducted, so had had career education for less than one year. So, while differences between career education school scores and the scores achieved by schools not participating in the program were generally small, the persistance of the favorable results is highly suggestive of career education potentials.

10 Specific career exploration course content was, also, tested and compared on a pre-course and post-course basis to test results obtained from the same pupils over career exploratory courses they had not yet received. That is, a procedure was developed where career exploratory pupils became a control group (as well as a treatment group) through the device of comparing their gains in tests assessing the course content they were receiving to the gains

FIGURE 2

Florida Statewide Assessment Program
Communication Skills - Total
Grade 9
March, 1976

		Mean Raw Score and Percent Correct					
		Pilot Schools			Comprehensive Schools		Total Career Exploratory Schools
		R. E. Lee	Mays	Rockway	W. R. Thomas	L. Stevens	
Treatment Groups	Mean Correct	61.4	72.3	87.8	72.6	67.1	74.5
	Percent Correct	57%	68%	82%	68%	63%	70%
	Number Pupils	36	31	89	67	71	294
Control Groups	Mean Correct	54.6	70.4	83.3	69.9	63.5	70.6
	Percent Correct	51%	66%	78%	65%	59%	66%
	Number Pupils	36	31	89	67	71	294

Note. The Florida Statewide Assessment Program for ninth-grade pupils was discontinued in 1974. However, with the State's permission, the test was administered locally within the Career Exploratory schools in March of 1976.

FIGURE 3

Florida Statewide Eighth-Grade Tests
Mean Total Score Results
Norm Referenced Tests

	Total Reading		Total Mathematics		Total Occupational Information	
Examinees	Mean	Number	Mean	Number	Mean	Number
Pilot and Comprehensive School Dade Career Exploration Students Grade 8	33.75	2,158	47.67	2,185	26.71	2,174
Total Dade Grade 8 Students	33.17	18,207	45.71	18,199	26.23	18,284
State Grade 8 Students	35.77	118,120	46.34	118,452	27.87	123,308
Maximum Score:	(60)		(78)		(40)	

achieved in tests measuring course content being taught to other students (but not to them, as yet).[8]

Results of this procedure appear in Figure 4. Pretest scores, posttest scores, and differences between these scores are shown for boys and girls separately and combined across each and all of the career exploratory areas being offered in the career education junior high schools. Each course lasted one-fifth of the year (so is called a quin—or quinmester—in the figure). Both the scores for students actually participating in a quin and those for pupils who had not yet entered into a designated career exploratory course are shown (these latter are called "Total Non-Quin Related Tests" in the figure). The tests were composed of items contributed by teachers of the various career exploratory courses; students were scored on the basis of percentages of these items correctly answered.

It can be seen in the figure that certain courses appeared to produce more gains than others, possibly due to differences in test difficulties. The significant finding, however, is the comparison between gains made in the quin tests to those evinced in the non-quin related tests. There was about a thirteen percent improvement in the former, and a trivial three percent gain in the course content which had not yet been taken. This result would appear to indicate knowledge gains were being realized from the career exploratory courses.

FIGURE 4
Comparisons of Gains Made by Boys and Girls in Career Exploratory Quin Tests

Quin	Electronics			Graphics			Mechanics			Sales and Marketing			Health			Home Econ			Business			Construction			Total*		
	Pre %	Post %	Diff	Pre %	Post %	Diff	Pre %	Post %	Diff	Pre %	Post %	Diff	Pre %	Post %	Diff	Pre %	Post %	Diff	Pre %	Post %	Diff	Pre %	Post %	Diff	Pre %	Post %	Diff.
Boys	29	39	+10	33	45	+12	30	43	+13	33	40	+7	35	49	+14	37	44	+7	41	59	+18	42	55	+13	34	47	+14
N	287	285		303	273		353	339		22	26		97	99		125	59		211	212		202	189		1600	1487	
Girls	27	35	+8	33	43	+10	27	36	+11	30	36	+6	36	19	+13	39	44	+5	43	59	+16	31	44	+13	35	47	+12
N	115	93		158	132		97	78		43	29		148	147		179	131		222	230		43	31		1005	871	
Total*	28	38	+10	33	44	+11	29	41	+13	31	38	+7	36	49	+13	36	44	+6	42	59	+17	40	53	+13	34	47	+13
N	402	378		461	405		450	417		65	55		245	246		304	190		433	442		245	220		2605	2353	
Total* Non Quin Related Tests	20	22	+2	20	24	+4	22	24	+2	19	20	+1	21	24	+3	20	20	+0	19	23	+4	21	22	+1	20	23	+3

*Total scores are weighted averages

11 An interesting finding concerning sex preferences in career exploration is, also, evident in that figure. A substantial number of girls were participating in career areas which had been the traditional provinces of males (mechanics and construction), and the boys were exploring domains which had been largely female–Home Economics. This broadening of course enrollments must be considered further evidence that career *exploration* was truly occurring.

12. Finally, selected items concerning school attitudes from the Florida eighth-grade testing program are shown in Figure 5. These items demonstrate that schools in Dade County which are offering career exploration tend to have, and perhaps produce, students who claim that their schools are teaching more about different kinds of occupations, who are more proud of their schools, who see the other students as more friendly, and who see more utility of what is being taught than is found in other Dade schools or the State, as a whole.

According to these pupils, their instructors have apparently been able to depart from a strict lecturing mode to more informal approaches such as discussion and individualized curriculums. Such gravitations would suggest that revelancy is occurring to sufficient levels that authoritarian approaches may be less required in the career exploration schools.

FIGURE 5

Florida Statewide Eighth-Grade Testing Program
Student Opinion and Attitude Poll - 1976
Percent of Pupil Responses

	Questionnaire Item	Percentage of Pupils Responding		
		State Eighth-Grade Students	Total Dade Eighth-Grade Students	Dade Career Exploratory Students Eighth-Grade
		%	%	%
1	How well is your school teaching about different kinds of occupations?			
	A: Very well	21	20	38
	B: Well enough	39	35	35
	C: Not well enough	31	34	16
2	How proud are you of your school?			
	A: Very proud	26	23	33
	B: Fairly proud	41	40	36
	C: Not too proud	20	23	19
	D: Not proud at all	11	12	10
3	How do you rate the friendliness of the students in your school?			
	A: Very friendly	17	16	18
	B: Friendly	63	61	62
	C: Unfriendly	12	14	13
	D: Very unfriendly	6	7	6
4	How often do your teachers show the usefulness of what you learn in school?			
	A: Most of the time	31	30	35
	B: Sometimes	40	39	39
	C: Hardly ever	17	18	16
	D: Never	9	9	7
5	Which method is used most often in your English classes?			
	A: Lecture	45	42	37
	B: Individual	21	22	22
	C: Discussion	26	25	29
	D: Lab	4	6	7
6	Which method is used most often in your Math classes?			
	A: Lecture	40	34	29
	B: Individual	31	36	43
	C: Discussion	28	17	15
	D: Lab	4	6	6

FOOTNOTES AND REFERENCES

1. Dade County teaches career education in the context of "clusters" of occupations. These clusters are *functionally*-related occupational families, e.g., construction and allied occupations or electronics and allied occupations. They are *vertically* organized clusters, in that all unskilled, semi-skilled, semi-professional and professional levels pertaining to a given occupation are grouped within the same occupational cluster. (*Horizontal* clustering would group all secretarial jobs, for example, as a cluster–perhaps entitled "clerical".)

   The evaluation discussed in this paper, strictly speaking, should be considered valid only for vertically-organized occupational clusters.

   For a complete description of Dade's career education program, please address requests to:

   Mr. Ernest Upthegrove, Director
   Vocational and Adult Education Programs
   Planning and Development Department
   205 HOB
   1410 N. E. Second Avenue
   Miami, Florida 33132

2. The majority of schools in Dade County have not yet installed the program due to severe funds limitations.

3. Norm-referenced tests are tests where an individual's score is compared to the average score attained by persons similar to the individual in background, age, sex or grade level. The average score for such a group is called a norm, which is presumably the score which might be reasonably expected to occur for a "normal" individual (all other factors being constant). Norm-referenced tests can be contrasted with *criterion-referenced* tests, in that these latter do not compare an individual's score with the group average, but rather determine a person's knowledge level of some curriculum content domain. Such tests attempt to identify what a person knows and doesn't know, irrespective of whether or not other persons sharing the same characteristics of the age, sex, etc., tend to know the content. Finally, a third type of test is variously entitled "home-grown", *locally developed*, or "teacher-made." These instruments are often somewhat of a merging of norm and criterion-referenced tests, since they are composed of items to assess one's knowledge of a content domain, but are often constructed from items of which it is considered "normal" for the "average" person to be in command.

4. The selection of most instruments used in the evaluations was determined through reviews such as it appears in Development Associates' *Evaluation and Educational Decision-Making - A Functional Guide to Evaluating Career Education,* which was prepared for HEW in 1975. Those chosen for Dade's evaluations were (a) Laverna Fadale's *Career Awareness Inventory* (Scholastic Testing Service), (b) John Crites' *Career Maturity Inventory* (McGraw-Hill).

5. The Stanford Achievement Tests in reading comprehension and mathematical computation, these subtests are annually administered to all Dade County pupils.

6. The State of Florida has developed criterion-referenced tests in the areas of reading, mathematics, social sciences, occupational knowledge and attitudes towards school for administration to selected grade levels in each school in the state. Certain of the results (eighth-grade and ninth-grade) from these assessment instruments were used to compare schools or students receiving career exploration to those schools or students in the county and the State not receiving the approach.

7. Instructors for the eight different career clusters being offered in the junior high school Career Exploration Program contributed items of a criterion-referenced nature concerning course content being taught to students in these career areas. From the pools of items developed by these teachers, 50 to 100-item tests were constructed to measure competency in Electronics, Graphics, Mechanics, Sales and Marketing, Health, Home-Economics, Business, and Constructional occupational clusters.

   In addition, items from each of these clusters were randomly drawn from the pools to construct a test to assess competency across all career exploratory areas. Students' scores for courses they were enrolled in were compared to their scores attained on this "across-the-board" test. It was expected that better scores would be realized in tests measuring course content being taught to the students than the scores achieved on tests covering areas which the students had not received - if instructional impact was occurring.

8. Technically, this procedure is analogous to an analysis of variance with nested factors design. It is somewhat akin to determining how good a swimming coach is by seeing how well students, who are being taught by the coach, gain in swimming overtime as compared to the gains being made by them in general physical coordination. The assumption is that their swimming skills will be more improved than other skills which are similar, but which are not being specifically taught, if the swimming instruction is truly effective.

YES JOHNNY, CAREER EDUCATION DOES WORK

by

Richard D. Ruff
Arizona Department of Education

Across this country the question–Does Career Education Work–is being asked again and again about all facets of education, and as you read both the lay and the professional literature there is growing evidence that although our education system has accomplished much, some very serious problems have developed.

Because there is a great deal of discussion about the bad news in education, today, some good news–*Career Education Is Working.* In Arizona, we have been involved in career education on a statewide basis since 1971. During that time we have collected a great deal of information concerning our program–ranging from simple interest surveys to highly sophisticated controlled studies.

Two major items will be covered in this paper:

1. Some of the evidence which has lead us to believe that career education is successful, and

2. Some of the reasons behind that success

However, before we enter into the discussion concerning evaluation results, a fundamental evaluation issue must be addressed. It is the issue of what we expect career education to accomplish. What is to be achieved before we declare that career education is beneficial? Many over ambitious requirements have been brought forth for career education, ranging from eliminating the unemployment problem–to solving worker dissatisfaction.

In our State, the primary achievement which the citizens expect career education to accomplish is the following. To provide the students of Arizona the knowledge and skills necessary to plan and prepare for a career. This is the primary goal.

In the last four years, we have conducted controlled evaluation studies in both rural and urban areas to obtain information relative to this goal. These

studies have involved students in grades 3–12, who have had high exposure to career education activities, and for comparison purposes, students who have had limited career education exposure. I would like to share some of the results with you. We have found that career education has significantly increased the student's knowledge in the following areas:

*First, students with high exposure to career education have achieved a greater knowledge of the wide range of occupations that are available to them. This is important. If a student is not aware of the options which are available, it is impossible for them to make an intelligent career choice.

*Secondly, we have found that career education has helped students develop a higher educational awareness: That is, it has helped students know more about the educational requirements for various careers. Again, this is extremely important. A student must know the educational background required for various careers in order for sound career planning to take place.

*Thirdly, we have found that career education has helped students develop a better understanding of the specific skills and abilities required for various careers, as well as, a better understanding of general requirements which are needed for success in business and industry.

*Fourthly, we have found that career education has been of benefit in that it has increased the student's understanding of the economic rewards associated with different occupations. as well as, helping the students to understand the life-style advantages and disadvantages which might affect their career choice.

I believe the student achievements which I have just noted are extremely important. A student must, indeed, have a

*Broader based knowledge of available occupations

*Must understand the preparation necessary to pursue those occupations

*Knowledge of the advantages and disadvantages associated with the occupations.

In order for effective career planning to take place, however, this is not sufficient. In order for realistic career planning to take place, students also need the confidence that their educational and occupational plans can be achieved.

The importance of this self-confidence cannot be overstated—for it influences not only level of aspiration—but also the likelihood that aspirations will be achieved.

The data from our studies indicate that career education did have a significant effect on increasing the student's self-confidence that their career plans were achievable. Students with high exposure to career education were more confident that their educational goals were achievable and more confident that their occupational goals could be attained.

Although the evidence cited provides a good indication that career education is working, it is important to note that whatever success has been achieved has not come without a major commitment. I would like to relate some of the reasons I believe we have experienced some success.

*First, our State legislature has been highly supportive. Arizona was the first State to pass special legislation for career education and State funds have been appropriated for the development and implementation of career education since FY-'72.

*Secondly, the career education effort has received fantastic support from business, industry and labor. They have truly opened their doors. For example, last year approximately 5,000 on-site tours were conducted involving 160,000 students. In addition, over 6,500 career speakers brought the world of work into the classroom to more than 375,000 students. The importance of this type of support cannot be overstated.

*Third, our State department of education has been highly supportive of the career education effort. As evidenced by the fact that our Superintendent of Public Instruction has designated career education as one of her high priority programs, and our State board has been highly supportive.

*Another reason for the success which we have experienced is the philosophy which has been assumed concerning our evaluation efforts. We have taken the position that the purpose of evaluation is two-fold. Our evaluation system was developed not only to provide data to establish whether or not career education is effective, but also data which can be used to make changes in the way career education is delivered, the purpose; therefore, is not only to "prove" but also to "improve."

*A final point relates to the project staff members and local educators who have assumed the real leadership for implementing career education. They are talented and enthusiastic educators.

These points represent some of the key factors for whatever success we have experienced. They are important because they are necessary wherever an attempt is being made to implement career education.

In closing, one summary point is important:

*If you believe the achievements which have been mentioned are important and

*If a solid commitment is extended to implement career education then—career education does work and you can tell Johnny that.

CAREER EDUCATION: AN OVERVIEW OF SOME PROOF THAT IT WORKS

by

Sidney C. High, Jr.
Office of Career Education
U.S. Office of Education

I felt quite honored when, a few weeks ago, I received a letter from Dr. T. S. Hancock, Chairman of the Commissioner's National Conference on Career Education, asking me to serve on a panel session devoted to the topic: "Career Education: What Proof Do We Have That It Works?" I was told that the panel would be chaired by Dr. Lois-ellin Datta of the National Institute of Education and would include Dr. Elvis Arterbury of Texas, Dr. Richard Ruff of Arizona, Dr. Frank Rapley of Kentucky, and Dr. Phillip Spieth of Florida. I was also told that my paper should be kept brief, in order to allow adequate time for each panel member's presentation.

In preparing this paper, I have, therefore, attempted to keep it short in length and to avoid using material which might overlap the presentations of the other panel members. For example, I will not be using any of the evidence about the effectiveness of career education which is emerging from the findings in the Dade County Public Schools in Florida, because I assume that Dr. Phillip Spieth will be discussing these findings in his presentation.

Our question for discussion today: "What Proof Do We Have That Career Education Works?" seems to me to be similar in some ways to another question which was being posed at the beginning of the 20th Century. That question was: "Can A Power-Driven Heavier-Than-Air Craft Fly?" That particular question was answered, for once and for all, on December 17, 1903 by Wilbur and Orville Wright. On that date, at Kitty Hawk, North Carolina, the Wright brothers made the world's first successful power-driven flight in a heavier-than-air craft. Now, they didn't fly very long (some 59 seconds) and they didn't go very far (some 852 feet), but they answered the question.

Never mind the fact that prior to and after December 17, 1903, numerous other individuals tried to fly a power-driven heavier-than-air craft and either failed to get off the ground or crashed during their flight attempt. The Wright brothers had proved that a power-driven heavier-than-air craft *could* fly.

It appears to me that career education in this country is now at about the stage that aviation was in at the beginning of this century. All over this country, there are "bicycle mechanics" who believe that career education can work. With baling wire and fabric and wood and bicycle sprockets and chains, they are lashing together prototype career education programs and are attempting to make them fly. When some of these prototype career education programs are brought to the acid test of a rigorous evaluation, it is found that they are not "getting off the ground." Others, it is found, get off the ground, then wobble, and crash. But there is increasing evidence that some of them fly, maybe not for many seconds nor for many yards, but they *fly*. It is I believe, by citing some of these "Kitty Hawk" type flights in career education that we can answer the question: "Do We Have Proof That Career Education Works?"

In order to assess whether career education efforts succeed in flying, we need to assess the extent to which these efforts are successful in attaining the goals which they purport to address. Although, at this stage in the history of career education, there is some variation across the country in the definitions and goals of individual career education projects, most career educators would agree that, as a common core, career education seeks to produce individuals who, when they leave school (at any age or at any level) are:

1. Competent in the basic academic skills required for adaptability in our rapidly changing society.

2. Equipped with a personally meaningful set of work values that foster in them a desire to work.

3. Equipped with career decisionmaking skills, job-hunting skills, and job-getting skills.

4. Equipped with job specific occupational skills and interpersonal skills at a level that will allow them to gain entry into and attain a degree of success in the occupational society.

5. Equipped with a degree of self-understanding and understanding of educational-vocational opportunities sufficient for making sound career decisions.

6. Aware of means available to themselves for changing career options—of societal and personal constraints impinging on career alternatives.

If we can agree that these six goals represent an important core, common to most definitions of career education, then the question becomes. "What Proof Do We Have That Career Education Can Attain These Goals?" I will, therefore,

present some examples of the kind of evidence which can be arrayed in regard to each goal. As mentioned earlier, I will try to avoid citing examples used in the presentations of the other panel members.

Goal 1: Competent in the Basic Academic Skills Required for Adaptability in Our Rapidly Changing Society

Evidence that career education can "fly" in terms of the attainment of this goal is found in a 1974 report by Dr. LeVene A. Olson of Marshall University in West Virginia. The report is entitled "A Study of Elementary and Secondary Career Education in Lincoln County." Dr. Olson reports that in the 1971-72 school year, 2,436 students were enrolled in grades 1 through 6 in the public school system of Lincoln County, West Virginia. At that time, 1,549 of these students were not involved in career education activities, while 887 students were involved. Dr. Olson's study dealt with randomly selected students from both groups. The study included 205 control students who were not involved in career education and 240 experimental students who were involved in career education. The California Achievement Tests were administered to both the control group and the experimental group in a pretest and posttest design. A procedure was used which provided the adjusted posttest means, using the pretest as a covariate. It was found that the adjusted posttest means using the experimental group were 11 percent higher than the adjusted posttest means for the control group on language achievement. It was also found that the adjusted posttest means for the experimental group were 24.5 percent higher than the adjusted posttest means for the control group on mathematics achievement. Thus it is evident that the career education program in Lincoln County was more successful in developing student competence in the basic academic skills of the language arts and mathematics than was the regular program into which career education had not been infused.

Further evidence in regard to Goal 1 is found in a June 1976 report submitted to the U.S. Office of Education by the Board of Education of Newark, New Jersey. This document represented the final report of USOE Grant No. G007502350. This document reports on a study of 237 elementary pupils who were involved in a career education program in grades 2 through 6 in the Newark Public Schools. In this study, the Metropolitan Achievement Test (total math score) was used. To determine if the achievement score growth exceeded what would have occurred due to normal (non-career education program) classroom instruction, pretest scores were adjusted using the Bond Singer method developed by the New York State Education Department. In grades 2, 4, and 5, these pupils who were involved in the career education program achieved *actual* posttest scores which were significantly higher than the *predicted* posttest scores. In grade 3, the *actual* posttest scores fell significantly below the *predicted* scores, while in grade 6 there was no

significant difference between actual and predicted scores. Thus, the career education program appears to have had a significant impact on increasing math achievement test scores in grades 2, 4, and 5.

Evidence in relation to Goal 1 is also found in a June 1976 report submitted to the U.S. Office of Education by the Indiana State Department of Public Instruction. This document represented the final report of USOE Grant No. G007502396. The document reports, among other activities, on a special career education program developed in a local school district, the Lakeland School Corporation. This special career education program was provided to approximately 40 eleventh-grade students who exhibited hard-core reading problems. All of these students had histories of repeated failures and the expected concurrent negative attitudes toward anything viewed as "academic." A teacher and an instructional aide were able to achieve dramatic reversals in attitudes and skill increases by using a variety of career-related instructional approaches, including guest speakers and career information filmstrips. The results of this activity were so encouraging that the local school board is now maintaining the program as a continuing activity, supported entirely with local money.

Goal 2: Equipped With a Personally Meaningful Set of Work Values That Foster in Them a Desire to Work

Evidence that career education can make progress in the attainment of this goal is found in a study conducted in Bismarck, North Dakota by Development Associates, Inc. The study is reported in a document submitted to the U.S. Office of Education by Development Associates, Inc. under Contract No. OEC-0-73-6663. The study concerns a career education program which was developed in the Bismarck Public Schools over a 3-year period, from June 1970 to June 1973. At the end of the 3-year period, Development Associates' staff administered the Attitude Scale of the Career Maturity Inventory to sixth-grade and ninth-grade pupils who had participated in the career education program and to sixth- and ninth-grade pupils who had not participated in career education. At the sixth-grade level, scores were obtained from 34 randomly selected participating students and from 31 randomly selected non-participating students. At the ninth-grade level, scores were obtained from 32 randomly selected participating students and from 32 randomly selected non-participating students. It was found that the participating students at the sixth- and ninth-grades demonstrated significantly more positive attitudes toward work, as measured by the Attitude Scale of the Career Maturity Inventory, than did the students who had not participated in the career education program.

Development Associates, Inc. conducted a similar study in the public school system of Lincoln County, West Virginia, at the end of the first three years of Lincoln County's career education program. It was found that sixth grade students who participated in the career education program, as well as twelfth-grade students who received project-sponsored career counseling, demonstrated significantly more positive attitudes toward work, as measured by the Attitude Scale of the Career Maturity Inventory, than did sixth- and twelfth-grade students who had not participated in the career education program. At the sixth-grade level, the study involved 30 randomly selected participating students and 29 randomly selected students who were not participants in the career education program. At the twelfth-grade level, the study involved 31 randomly selected students who had participated in the project-sponsored career counseling, and 58 randomly selected non-participating students.

Further evidence in relation to Goal 2 is found in a June 1976 document submitted to the U.S. Office of Education by the Southwest Vermont Supervisory Union, this document constitutes the final report for USOE Grant No. G007503731. This document reports on a study to measure work value development utilizing Dr. Donald E. Super's "Work Values Inventory." This instrument assesses 15 work values. In the study, 112 sixth grade students were pre-tested and post-tested, and compared with national norms. It was determined that, during the 1975-76 school year, significant positive work value development took place for the 112 sixth-grade students. The students made positive gains in all 15 of the work values identified by Dr. Super. At the beginning of the school year, the students were below the national norms on all 15 work value scores. By the end of the school year, they were below the national norms on only 5 of the scores, they had exceeded the national norms on 10 of the 15 scores.

Evidence in relation to Goal 2 is also found in 2 studies reviewed by B. W. Tuckman and J. A. Carducci in their report entitled *Evaluating Career Education: A Review and Model.* One of these was a study reported by Ovard in 1973, concerning sixth-grade students in Utah. This study, utilizing Chi Square Analysis, found that the sixth-grade students involved in career education showed favorable change in attitude toward work. The other study cited by Tuckman and Carducci was reported by Young in 1971 and dealt with students in grades 1-8 in New Orleans. The study utilized the Attitude Toward Work Inventory. A t-test indicated a significant positive gain for the students in grades 1-8.

Goal 3: Equipped with Career Decisionmaking Skills, Job-Hunting Skills, and Job-Getting Skills

Evidence that career education can successfully address this goal is found in a 1975 report from the Pima County School System in Arizona entitled: "Summary Evaluation Report of Career Education." This report states that a t-test comparison of means for junior high school students having more exposure to career education with students having low exposure yielded statistically significant differences (.001) in the high exposure group's greater ability "to recognize and demonstrate the decisionmaking skills associated with various occupational roles."

Furthermore, a 1975 Arizona document prepared by Behavioral Research Associates and entitled: "Cochise County Career Education Project" states that a t-test comparison demonstrated that secondary students with high exposure to career education were more knowledgeable (statistically significant at .001) about decisionmaking skills than were secondary students with low exposure to career education.

Additional evidence in relation to this goal is provided in a June 1976 document submitted to the U.S. Office of Education by Maine School Administrative District #51 in Cumberland Center, Maine. This document represented the final report for USOE Grant No. G007502238. The report describes a study involving 18 experimental students who were enrolled in a ninth-grade English class into which career education had been infused, as well as 20 students enrolled in a comparable ninth-grade English class into which career education was not infused. Scores on the Decisionmaking Skills Scale of the Careers Orientation Battery, Form 912, were obtained from both classes at the end of the school year in May of 1976. The mean for the experimental class was 10.22 (standard deviation: 2.24). The mean for the comparison class was 8.40 (standard deviation: 2.37). The difference of means (1.82) was significant at the .005 level of confidence. The results indicate that the experimental teacher's infusion of career education oriented activities into the English instruction resulted in significant growth for the experimental students in regard to career decisionmaking skills.

Evidence in regard to career education's success in improving the job-getting skills of students is found in a study reported by Robert Rochow of the local school district in Pontiac, Michigan. In the Pontiac study, 30 high school students were provided with special instruction designed to improve their job-getting skills. A matched control group of similar students was established, and the control group received no special instruction in regard to job-getting skills. All 60 of the students were then interviewed by corporate personnel hiring managers in Pontiac. The personnel managers had no knowledge as to

which students were in the experimental group and which were in the control group. The managers were simply asked to select from the 60 youngsters those whom the corporation would hire. Of the students selected for hiring in this simulated exercise, it was found that nine out of ten were from the experimental group that had received special instruction in job-getting skills. This indicated, at the .005 level of confidence, that the experimental students who had been instructed in job-getting skills had a much greater chance of being selected for employment than did the control group of similar youngsters who had not been provided with the special instruction.

Goal 4: Equipped with Job Specific Occupational Skills and Interpersonal Skills at a Level that will Allow Them to Gain Entry Into and Attain a Degree of Success in the Occupational Society

Evidence indicating career education's ability to progress toward this goal is found in a study conducted by Development Associates, Inc. in Jones County, Mississippi. The study involved a career education program which had been developed over a 3-year period in the Jones County Public School System. At the end of the 3-year period, Development Associates' staff obtained scores on a scale assessing job readiness knowledge and a scale assessing job readiness attitudes from students at the sixth-, ninth-, and twelfth-grade levels who had participated in the career education project as well as students from the same grade levels who had not participated in career education. At the sixth-grade level, the study included 34 randomly selected participating students and 35 randomly selected non-participating students. At the ninth-grade level, the study included 31 randomly selected participating students and 30 randomly selected non-participating students. At the twelfth-grade level, the study included 30 randomly selected students who had participated in project-sponsored work experience activities and 17 randomly selected non-participating students. It was found that the participating students at the sixth-, ninth-, and twelfth-grade levels scored significantly higher on the scale assessing job readiness knowledge than did the non-participating students. It was also found that the participating students at the sixth- and twelfth-grade levels scored significantly higher than non-participants on the scale assessing job readiness attitudes.

Development Associates, Inc. conducted a similar study at the end of the first three years of the career education program in Lincoln County, West Virginia. This study involved randomly selected groups of about 30 students each representing participants and non-participants at the sixth, ninth, and twelfth-grade levels. It was found that the participating students at the sixth- and twelfth-grade levels scored significantly higher on the scale indicating job readiness knowledge than did the students who had not participated in the career education program. It was also found that participating students at the

ninth- and twelfth-grade levels scored significantly higher than non-participating students on the scale assessing job readiness attitudes.

Goal 5: Equipped with a Degree of Self-Understanding and Understanding of Educational-Vocational Opportunities Sufficient for Making Sound Career Decisions

Evidence of career education's effectiveness in attaining this goal is found in the 1974 report by Dr. LeVene A. Olson of Marshall University which was referred to under Goal 1. Dr. Olson's study, which was conducted during the 1971-72 school year, dealt with 205 randomly selected control students who were not involved in career education and 240 randomly selected experimental students who were involved in career education, with both groups being drawn from the 2,436 students who were enrolled in grades 1 through 6 in the public school system of Lincoln County, West Virginia. A locally constructed "Occupational Awareness Test" was administered to both the control group and the experimental group in a pretest and posttest design. A procedure was used which provided the adjusted posttest means for occupational awareness using the pretest as a covariate. It was found that the adjusted post-test means for the experimental group were 18 percent higher than the adjusted post-test means for the control group on the Occupational Awareness Test.

Development Associates, Inc. has also reported findings from a study conducted at the end of the first three years of the career education program in Lincoln County, West Virginia. The Development Associates study involved randomly selected groups of about 30 each representing participating students and non-participating students at the sixth-, ninth-, and twelfth-grade levels. Development Associates reports that participating students at the sixth-, ninth-, and twelfth-grade levels were able to name a significantly greater number and variety of occupations than were the non-participating students. Development Associates also reports that participating students at the sixth-, ninth-, and twelfth-grade levels demonstrated significantly greater familiarity than non-participating students with the tasks and functions associated with selected occupations, as measured by Part 2 of the Competency Test of the Career Maturity Inventory. In addition, participating students at the sixth-, ninth-, and twelfth-grade levels demonstrated significantly greater familiarity than non-participating students with the requisites associated with selected occupations, as measured by Parts 3 and 4 of the Competency Test of the Career Maturity Inventory.

Development Associates, Inc. conducted a similar study in the public school system of Jones County, Mississippi, at the end of the first three years of that county's career education program. Again, the study involved randomly selected groups of about 30 each representing participating students and

non-participating students at the sixth-, ninth-, and twelfth-grade levels. It was found that the participating students at the ninth- and twelfth-grade levels were able to name a significantly greater number and variety of occupations than non-participating students. It was also found that participating students at the sixth- and ninth-grade levels demonstrated significantly greater familiarity than non-participating students with the tasks and functions associated with selected occupations, as measured by Part 2 of the Competency Test of the Career Maturity Inventory. In addition, it was found that participating students at the ninth- and twelfth-grade levels demonstrated significantly greater familiarity than non-participating students with the requisites associated with selected occupations, as measured by Parts 3 and 4 of the Competency Test of the Career Maturity Inventory.

In a similar study in the public school system of Bismarck, North Dakota, Development Associates again involved randomly selected groups of about 30 students each representing participating students and non-participating students at the sixth-, ninth-, and twelfth-grade levels. It was found that the participating students at the sixth-, ninth-, and twelfth-grade levels were able to name a significantly greater number and variety of occupations than non-participating students. Also, participating students at the sixth- and ninth-grade levels demonstrated significantly greater familiarity than non-participating students with the tasks and functions associated with selected occupations, as measured by Part 2 of the Competency Test of the Career Maturity Inventory. In addition, participating students at the sixth- and ninth-grade levels demonstrated significantly greater familiarity than non-participating students with the requisites associated with selected occupations, as measured by Parts 3 and 4 of the Competency Test of the Career Maturity Inventory.

A study at the level of the second-grade was conducted by the Northwest Tri-County Intermediate Unit in Edinboro, Pennsylvania. This study was reported in the June 1976 final report which the Tri-County Intermediate Unit submitted to the U.S. Office of Education under USOE Grant No. G007502398. The study dealt with 15 experimental students who had been involved in career education activities, and 15 control students who had not been involved. A locally-developed evaluator-administered individualized career knowledge test was given to the students. The results showed the experimental group mean of 17.67 to be significantly higher at the .05 level of confidence than the control group mean of 11.87.

The New York State Education Department, in its June 1976 final report for USOE Grant No. G007502353, reports on a study involving seventh- and eighth-grade students in a small rural school district, the Spencer-VanEtten Central School District. The design for the study was posttest only, with

controls. In this study, a special career guidance course was presented to experimental groups of students at the seventh- and eighth-grade levels. A posttest concerned with self-concepts, self-knowledge, and values, and how these things affect career choices was given to seventh-grade students (25 experimental and 49 control) and to eighth-grade students (21 experimental and 50 control). At both grade levels, the differences in scores between the experimental students and the control group students were statistically significant at the .01 level, with the experimental students scoring higher.

Unified School District #250 of Pittsburgh, Kansas, in a 1975 evaluation report, describes a study which dealt with 200 students randomly selected from six elementary schools that were involved in career education as well as a group of control students not involved in career education. Both the experimental career education students and the control students were drawn from grade 3 and grade 6. The Self Observation Scales were the instruments utilized in the study. At grade 3, out of 18 possible comparisons, the career education students exceeded the national norm *and* exceeded the average percentile score of the control group in 12 cases. At grade 6, out of 30 possible comparisons, the career education students exceeded the national norm in 24 cases *and* exceeded the average percentile score of the control group in 28 cases.

A 1973 doctoral dissertation submitted to Kansas State University by Stanley Dee Greene reports on a study in Santa Barbara, California, involving students in grades 7 through 12. In this study, 50 students were randomly selected at each grade level (7–12) from both experimental schools which were involved in career education and control schools which were not involved. A total of 531 students were pretested in September of 1972 and posttested in May of 1973. The Career Maturity Inventory and a locally-prepared Occupational Information Survey were used. The effects of the career education program were found to be quite large. The mean difference on the measures used ranged from 0.47 to 0.97 of a standard deviation of the gain scores. On the basis of this comparison of scores of the experimental and control groups, it was concluded that the career education program was effective at all six grade levels tested and that it was equally effective for both sexes.

The Board of Education of Newark, New Jersey, in its June 1976 final report for USOE Grant No. G007502350, has reported on a study involving students in grades 4 to 6. During the early fall of 1975, and again in the late spring of 1976, 314 students in 21 classes in 11 schools which were participating in the career education program were given a career awareness test. In every class tested, the students scored significantly higher at the end of the year than at the start. Unfortunately, no control group scores were reported for students not involved in career education activities, so it is not

possible to assess the gains made by the career education students in relation to gains which might be expected to occur normally in non-participating students.

Mention should also be made of several studies which were reviewed by B. W. Tuckman and J. A. Carducci in their report entitled *Evaluating Career Education: A Review and Model.* Tuckman and Carducci mention a 1973 study by Sims in Cleveland, Ohio involving fifth- and sixth-grade students. When a job information questionnaire was administered, analysis of variance indicated that the students in the career education schools had acquired more job information than students in the control schools which did not participate in the career education program. Tuckman and Carducci also cite a 1974 study by Warren in Kansas, which utilized the Career Maturity Inventory at grade levels six through eight. A t-test indicated significant differences in mean scores in favor of the career education group.

A further study reviewed by Tuckman and Carducci was one in Alameda County, California, reported by Bariolo in 1972. This study utilized the Occupational Information Survey at the elementary school level. A t-test indicated greater gains for the career education students than for the control students.

A study at the third-grade level was conducted at the Cumberland Elementary School in Maine. This study was reported in the June 1976 final report for USOE Grant No. G007502238, which was submitted to the U.S. Office of Education by Maine School Administrative District #51. The study involved 21 experimental students enrolled in a third-grade classroom in which the teacher had developed a career-oriented instructional program, as well as 22 comparison students enrolled in a third-grade classroom in which the teacher provided a traditional subject-matter oriented instructional program. The Careers Orientation Battery, Form 24, was administered to both groups of students in May of 1976. Differences between the scores of the two groups were found to be statistically significant at the .005 level of confidence on the Self-Esteem Scale of the Careers Orientation Battery and at the .05 level of confidence on the World of Work Scale of the Battery. It was concluded, therefore, that the experimental teacher's infusion of career-oriented activities into the instructional program resulted in significant measured growth for the experimental students in developing positive attitudes toward themselves and in developing awareness of the requirements for and the nature of various jobs.

A study at the high school level is also reported in this same June 1976 final report from Maine School Administrative District No. 51. The high school level study involved 18 experimental students enrolled in a ninth-grade English class into which the teacher had infused career education concepts, as well as 20 comparison students enrolled in a ninth-grade English class which did not

utilize career-education-oriented approaches. The Careers Orientation Battery, Form 912, was administered to both the experimental and the comparison classes in May of 1976. Differences between the scores of the two groups were found to be statistically significant at the .05 level of confidence on the Technology Scale, the Attitude Toward School Scale, and the Nature of Jobs Scale of the Careers Orientation Battery. It was concluded, therefore, that the experimental teacher's infusion of career-education-oriented activities into the English class resulted in significant growth for the experimental students in understanding of the impact of technology on their lives and in awareness of the nature and requirements of jobs. It was also concluded that the experimental students viewed school as more satisfying and relevant to their personal needs than did the comparison students.

Goal 6: Aware of Means Available to Themselves for Changing Career Options—Of Societal and Personal Constraints Impinging on Career Alternatives

Evidence of the effectiveness of a career education program in relation to this goal is found in the June 1976 final report which was submitted by the Board of Education of Newark, New Jersey under USOE Grant No. G007502350. The project which was supported by this USOE grant had a specific objective to "utilize career education to improve high school student perception of his/her ability to control their own lives." The Nowicki-Strickland Locus of Control Scale was administered to 69 students in the fall of 1975 and again in the spring of 1976. The difference between the pretest and the posttest scores indicated that these students who were involved in the career education project increased significantly in their self-perceived ability to control their own lives.

Concluding Remarks

On the preceeding pages, I have attempted to present some examples of the kind of evidence which can be arrayed regarding the ability of career education programs to attain six important and commonly agreed upon goals of career education. These examples are not based on an exhaustive study of the evaluation literature in career education, but have been extracted from a few reports, representing only a fraction of the extant literature, which I have had the time to examine. A comprehensive examination of the literature would involve considerably more effort and would result in a much greater number of examples, but the presentation of the findings would require considerably more time than has been allotted to me for this panel presentation.

These examples which I have cited represent some "Kitty Hawk" type flights in career education that serve as proof that career education *can* work,

just as the Wright Brothers, with their "Kitty Hawk" effort, proved that a power-driven heavier-than-air craft *could* fly. Now, career education is still a long way from aviation's supersonic jet transport which regularly and reliably, day after day, carries passengers some 3,800 miles across the Atlantic Ocean from Washington to Paris in 3 hours and 50 minutes. But we do have increasing evidence that career education can "get off the ground" in relation to the goals which it purports to address. With continuing and increasingly rigorous work, there is good reason to believe that career education can progress from the fluttering bi-plane stage to the highly-refined stage of the supersonic jet transport.

In order to continually assess progress in this regard, all career educators need to devote increasing attention to the conduct of carefully-designed evaluation studies of their career education activities. Ideally, these evaluation studies should use carefully designed and well standardized instruments, should provide for pretesting and posttesting, and through the use of control groups or other devices, should provide estimates of the effects of "non-treatment." It is only through the use of such rigorous evaluations that we can continually refine and improve the delivery of career education until it reaches a stage comparable to that of modern aviation.

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APPENDIX

MONOGRAPHS ON CAREER EDUCATION

Prepared under the auspices of
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This publication is one of a continuing series of monographs issued by the Office of Career Education of the U.S. Office of Education. The previous monographs in the series are as follows:

O'Toole, James. *The Reserve Army of the Underemployed.* Washington, D.C.: U.S. Office of Education; 1975 (ED-109-509)

Chenault, Joann. *Career Education and Human Services.* Washington, D.C.: U.S. Office of Education; 1975 (ED-109-507)

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GPO 921-303