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THE ACQUISITION OF CRITICAL THINKING SKILLS AND

PERSONAL QUALITIES IN BEHAVIOR DISORDERED

STUDENTS IN REAL WORLD ENVIRONMENTS

VERSUS STRUCTURED CLASSROOM SETTINGS

A DISSERTATION SUBMITTED TO

THE FACULTY OF THE GRADUATE SCHOOL

IN CANDIDACY FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

DEPARTMENT OF CURRICULUM, INSTRUCTION & EDUCATIONAL

PSYCHOLOGY

BY

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CHICAGO, ILLINOIS

JANUARY, 1997

ii

ACKNOWLEDGMENTS

DEDICATION

I would like to dedicate this project to my children: Brian, for all of his extra babysitting; Allison, for forcing me to keep perspective during this long, tedious process; and to "the little one on the way" for reminding me that I needed to get this done soon!

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

There is a crisis in our education system that many feel threatens our

very existence as a 21st century modern nation. According to the National

Alliance of Business (Chicago Tribune, 1990), we are woefully behind in

preparing our young people to be successful in the world of work. At the

same time, our lack of a well-trained workforce is putting us behind in the

global market. Lower wages and a high technology are two of the reasons

that large corporations are moving their main operations to other countries

(McKernan,1994). One example that McKernan cites is Minnesota-based

3M Corporation which set up a software writing operation in India because of

the availability of trained technicians and managers. They followed this with

a manufacturing unit. According to former Secretary of Labor Robert Reich,

money can be moved anywhere, as well as technology and managers

(Hoerner, Wehrley, 1995). He also stated that the "determining factor for

America in the new global economic competition will be the skill of our workforce"(p.10).

Statement Of The Problem

Before we can attempt to prepare our young people for adulthood, we must provide them with basic competencies. Experts opine that from one third to three fourths of our younger students do not acquire the basic competencies of literacy, numeracy, and problem solving attitudes (Carnevale, Gainer & Metzger, 1989) . Jasparro (1995) states that only 25% of our population complete 4 years or more of college, yet our educational institutions almost exclusively emphasize preparation for college. The 'Total Quality Education' movement and others point out these problems and note that the system does not need improvement, it needs to be changed (Jasparro 1995). We take 5 and 6 year olds who have gone through the most rapid learning period they will experience using primarily curiosity and exploration and put them in the most restrictive and stultifying situation imaginable, the classroom (Senge, 1994).

There are two basic inadequacies with our current system of schooling. One is the dispensing of information in a teacher-lecture format, or a teacher-directed format. With today's technology, computers can do the same thing cheaper and more efficiently. There is way too much information today for students to be expected to learn and retain. Although there may be cause for the rote learning of some kinds of information, most often students acquire, memorize and forget information that has not proven to be relevant to their current situations (Jasparro, 1995). Students are expected to work in social isolation and to engage in disconnected and abstract mental exercises, usually with little or no access to the kinds of practical aids, tools or equipment used for on-the-job problem solving in the real world (Vickers,1994). There is a growing body of evidence that suggests that people learn more efficiently when motivated by the desire or need to solve real-world problems. Vickers (1994) states that learning is less efficient when formal knowledge is delivered in the abstract and when there are no opportunities to apply that knowledge to tangible purposes in realistic contexts. Goodlad (1983) states that "teachers appear to teach within a very limited repertoire of pedagogical alternatives emphasizing their own talk and the monitoring of seatwork" (p.553). He further states that classroom contingencies encourage and

support minimal movement, minimal student-to student or student-to-teacher interaction. Mostly , it is textbook centered, with limited student responses. Formal schooling has not changed much since the early 80's. The second inadequacy in our current system, is the lack of transfer of what is learned from the classroom to real life. In the training industry, it is estimated that only 10% of what adults learn in a formal training seminar is actually transferred to the job (Broad, Newstrom 1992). Studies have shown similar results for high school students (Berryman, 1991). Learning theorists and cognitive scientists suggest that we learn 10% through hearing, 14% through seeing, 40% through seeing and hearing, and 80% by experiencing and doing (Hoerner, Wehrley, 1994). The most effective way of learning is in context, placing learning objectives within a real life environment rather than insisting that students learn first in the abstract what they will be expected to apply (Secretary's Commission on Achieving Necessary Skills, 1991). Lauren Resnick of the University of Pittsburgh, identifies four ways that out-of-context school learning differs from the kind of learning that occurs and is required in the real world:

First, students are expected to do things by themselves. In the real world,

people usually work and solve problems as teams or by helping each other. Second, students are judged on how well they can do on their own, without notes, calculators, or other aids. Doing well at work depends on using mental and physical tools. Third, school learning is mostly about manipulating abstract symbols, but thinking and doing in the real world is mostly connected to concrete situations. Finally school learning is generalized, while outside learning is specific to a given context (Shanker, 1988, E7).

In a work-oriented society such as the one we live in, where the primary focus of the educational system is based on the premise "people work to live", all students should be encouraged to see the connection between the schooling process and their future as productive individuals (Hoerner, Wehrley 1995,p.13). Work provides one major way in which an individual interacts with the environment, and that exploratory activities in work and community provide a useful vehicle to help individuals clarify their values, needs and goals in fashioning a meaningful life (Hansen, 1977). Resnick (1987) states that modern life requires successful citizens to have problem solving and critical thinking skills, and that educators must address these

needs and "empower all students (including those in special education) to acquire, transfer, and apply higher order cognitive skills in a variety of settings"(p.15). Means and Knapp (1991) point out that students with special learning needs typically have the least access to programs that would develop these skills. A lack of opportunity for advanced learning has contributed to limited employment possibilities and difficulty in adjustment to adult life for many of these students (Means, Knapp, 1991). Alternative approaches to teaching and learning might be useful to special and remedial educators who wish to develop the basic and advanced mental skills of their students (Rojewski, Schell,1994).

In order to effectively address these problems, there must be a major thrust to change the paradigm of our current system of educating children. The need for a stronger connection between work and the schooling process is becoming evident. If we are going to bring more relevance to the education of our students and at the same time meet the workforce demands of our economic market, this change will need to be rapid. The paradigm must shift from content-oriented, devoid of application to a process that prepares everyone to be productive members of society.

According to Hoerner and Wehrley (1994), educators must see themselves as human resource developers. Work-based learning is the business of human resource development. How many educators continue to ask their students if they are going to work or to college? We must get rid of this dual role of tracking our students in an economy where it is now acknowledged by the National Alliance of Business (Chicago Tribune, 1990) that 82 million jobs in the United States will not require a bachelor's degree. College is not the only road to success. Deciding if students are college bound or vocational bound only perpetuates an elitist mentality that serves to promote a classist system of "haves and have-nots."

Our current system that includes a vocational education program for those track of students who are not college bound, often have an academic component that is somewhat weak. The job skills that they obtain are adequate to some degree, but they aren't being exposed to jobs that have future opportunities. Most often the jobs have little or no relevance to what they have learned in school. They are placed in positions where they aren't encouraged to develop themselves professionally. It is important to enhance the learning potential of each worksite. In other words, which skills and

competencies are necessary to complete a particular job, and which skills and

competencies would be necessary to advance in these jobs. According to

Vickers (1994), teachers and job coordinators seem to believe their job is

done when an interested employer agrees to give a student a job. If employers

could be trusted to put together a well-designed program, this attitude may be

acceptable (Vickers, 1994). Simon, Dippo, and Schenke (1991) recommend

that each job placement be guided by a training plan developed

collaboratively by the employer, educator and student. One of the

consequences of this lack of planning is that students jump from job to job

with no real direction, until at some point years later they may land

themselves in a position with some promise.

Although the number of students dropping out of high school is at a

national average of 25%, many students drop out of the schooling process

while being counted in attendance (Hoerner, Wehrley, 1995). In other words,

they go to school, but don't participate. There is an additional number of

students who do as they are asked and achieve passing grades, yet are turned

off by the learning process (Clinchy, 1985). They see little relevance,

although they are trusting of the adults in their lives to believe that structured

schooling is the best medicine. For special education students with behavior disorders and emotional disabilities, the dropout rate has been as high as 56% (Wagner,1989). Wagner (1989) looked at this group six months after leaving school and found that 61% were unemployed and not in any type of formal schooling or training program. Only 18% of those who were employed were making more than minimum wage.

High school students are able to start making decisions for themselves in terms of careers based on their area of interest. During times of war, we have nineteen and twenty year olds manning sophisticated missiles, maintaining the ultra-high tech aircraft defense systems, clearing mine fields, moving soldiers and materials on a moment's notice (Byrne, Constant, Moore 1992). "The Gulf War vividly demonstrated what the American armed forces have learned over the last 15 years: that young Americans from all backgrounds can quickly make the transition from the youthful indulgences of high school to responsible adulthood, given the proper motivation, training and examples from adults" (Byrne, Constant, Moore 1992,p.24). This provides a strong argument in favor of an apprenticeship system or work-based learning during the later high school years. Students do have an idea of

their interest and can be assessed for their strengths and weaknesses, but don't have the expertise to translate this information into particular careers or clusters of careers. An apprenticeship system, with job shadowing, internships, and well designed educational plans would give students the experience necessary to translate this information. This would also allow them to eliminate areas that don't fit. Apprenticeship programs emphasize authentic problem-solving experiences with expert guidance in lieu of decontextualized learning (Rojewski & Schell, 1994). This instructional approach can support the acquisition, use and transfer of basic and advanced skills required in school and in adult life by special needs learners (Rojewski & Schell, 1994).

Critics of this linkage between school and business, are concerned with bringing business into our educational system. According to Molnar (1990), educators cannot bar industry from the schools, but we can formulate sound policies for structuring the relationships. Historically, educators have always sought the advice and counsel of business people and have been receptive to the influence of the business community. Generations of superintendents have been involved in their local service clubs, such as Rotary and Lions.

There are school-business partnerships forming at nearly every level of involvement. The issue we confront is not whether business should be involved, but what manner of involvement shall we support and why. Almost every profession has created partnerships with others. Lawyers, accountants, consultants, and even some in the medical field are making their clients and other professionals part of the process. Collaboration is the key to change. According to Fullan (1993), "the ability to collaborate on both a large and small scale is becoming one of the core requisites of postmodern society" (p.11).

Purpose of This Study

The purpose of this study is to determine if students can achieve the goals of our educational system, specifically in the area of critical thinking skills, while learning in the workplace and in the community as well or better than in a structured classroom environment. Work-based learning provides the relevance and real world opportunity for learning that many students are lacking in their formal schooling process. Critical thinking and problem

solving skills have been deemed to be some of the more important skills that

education needs to address in order to adequately prepare our students for the

world of work (Carnevale,1991), as well as to prepare them for good

citizenship skills and participation in a democratic society. Glaser (1985)

points out that "good citizenship calls for the ability to think critically about

issues concerning which there may be an honest (or dishonest) difference of

opinions." The Secretary's Commission on Achieving Necessary Skills

(SCANS), put together by the U.S. Department of Labor, completed a study

that listed 3 main foundation areas for schools to consider implementing as

part of the curriculum: basic skills, thinking skills and personal qualities.

These are the foundation skills associated with higher level jobs in today's

workforce (Greenan,Jarwan, 1992) . The National Council on Educational

Standards and testing has endorsed these competencies, and strongly suggest

that they be integrated into the national standards (SCANS Report, 1992).

Research Questions

The questions to be answered by this research are:

1. Can students acquire the critical thinking skills, as outlined by the

educational system , in a real world environment versus a structured classroom environment?

2. Which approach to instruction shows more promise for increasing students skills in this particular area?

3. Do specified alternatives to conventional teaching practices contribute as effectively to student learning as the more traditional approaches to teaching?

4. Does work-based learning provide students with the employability skills necessary to be productive members of the workforce, as outlined by the SCANS report published by the U.S. Department of Labor?

Assumptions

There are several assumptions that will be made:

1. The academic competencies, specifically in the area of critical thinking, outlined by the educational system are representative of the type of education that will allow students to become productive members of society.

2. The competencies outlined by the U.S. Department of Labor, if achieved will allow students to integrate into the workforce in a way that will meet the needs of the workforce.

Definitions

The terms to be defined for the purpose of this study are:

1. Real world environment - will refer to any system of education that utilizes workplace and community settings for learning at least 30% of the time.

2. Structured classroom setting - will refer to any system of education where the primary method of learning takes place in a classroom setting under the direction of a teacher, and less than 30% of the time is spent in other types of learning environments, such as field trip or alternative schooling sites.

3. Work - Based Learning - Learning experiences and activities that are based on and in some type of work setting or simulated work setting.

(Hoerner, Wehrley 1995).

4. Critical Thinking Skills - As used by Watson and Glaser in their

measurement of critical thinking skills (Dressel & Mayhew,1954):

    a. The ability to define a problem

    b. The ability to select pertinent information for the solution of a

       problem

    c. The ability to recognize stated and unstated assumptions

    d. The ability to formulate and select a relevant and promising

       hypothesis

    e. The ability to draw valid conclusions and judge the validity of

       inferences

5. Personal Work Qualities - attendance and work completion as determined

by the U.S. Department of Labor in the 1992 SCANS Report.

CHAPTER II

REVIEW OF THE LITERATURE

The review of the literature will focus on studies that involve the variables of this project. Specifically, these variables are critical thinking and problem solving skills, achievement of competencies in non-traditional learning environments, transfer of learning, and meaningful learning.

Critical Thinking and Problem Solving Skills

Roth (1992) describes critical thinkers as those who do not take for granted the universal truth of a statement, policy or justification merely because the authority ascribed to the source of the supposed truth. "Critical thinking is central to becoming liberally educated. A liberal education is one that frees the individual from the oppression of unscrutinized opinion or feeling" (Roth, 1992).

There is evidence that critical thinking can be substantially improved by certain kinds of instruction and guidance woven into the regular education curriculum (Glaser, 1985). Glaser conducted a study that included 4 groups of high school students enrolled in a regular English class. The treatment groups received special instruction in critical thinking as part of their required course work. The students were given the Watson-Glaser Critical Thinking Appraisal as a pretest and a different form of this appraisal was given as a posttest. The findings concluded that with special instruction, high school students can substantially improve their critical thinking skills. Glaser (1985) also finds that while critical thinking requires at least a modest degree of mental activity, it is by no means exactly the same quality as intelligence. A person of average intelligence can be trained to improve their skills in this area. In other words, a person who scores high on mental ability may score low on the Critical Thinking Appraisal, yet it is rare for a person who scores high on the Critical Thinking Appraisal to score below the 50th percentile on a test of intelligence. He concluded by saying that content alone in a course, including math and science courses, is not likely to develop generalized ability to critically think and reason logically. While we tend to make the

fewest errors in judgement and reasoning in situations in which we have had the most experience, one's ability to apply knowledge to the solutions of given problems does not vary directly with one's knowledge of the facts pertaining to those problems (Glaser, 1985). Glaser suggests the following factors that would affect the acquisition and learning transfer of critical thinking skills:

1) method of presentation

2) the degree to which self-activity and personal experience in analyzing and responding to given problems are induced

3) the degree to which effort is made to search for the guiding principles

4) the extent to which desired outcomes are set up as goals for instruction

5) the extent to which the processes of reasoning are made clear to the student

6) the degree of similarity to which specific elements in the training and those elements which are confronted in the new situations to which transfer is desired

Dewey (1944) sums up the training of critical thinking skills when he states that thinking is not achieved through repeated performances of sets of exercises. This will not cause one to be a good thinker. And as Glaser (1985) concludes the need for critical thinking skills in today's students, "it helps citizens to form intelligent judgements on public issues and thus contribute democratically to the solution of social problems"(p.26). There is an urgent need in today's society for its citizens to be able to think critically.

Achievement of Competencies in Non-Traditional Environments

Collins, Brown and Newman (1987) state that a critical element in fostering learning is to have students carry out tasks and solve problems in an environment that reflects the multiple uses to which their knowledge will be put to use. They refer to "situated learning" which serves several purposes. First, students begin to understand the uses of the knowledge they are learning. Second, they learn by actively using knowledge. Third, they learn the different conditions under which their knowledge can be applied. Fourth, students learn in multiple contexts, those where the knowledge is tied to the context of its uses, and those that are independent of any problems and new

domains.

In discussing alternative learning sites, Bowles and Gintes (1976) note that school cultures emphasize obedience and submission to rules, which are characteristic traits found in lower levels of the occupational hierarchy. It isn't until students reach the college level that learning becomes more self-directed, which prepares them for professional and managerial roles. Consequently, the 75% of the student population that doesn't attend college will not have the opportunity to develop the skills that today's job market is demanding, particularly the ability to think critically and make decisions.

A study done by Fred Newmann and Robert Rutter (1983) looked at the effects of students' social development while in community service programs. These students were compared to those students not participating in community service programs in several areas, one of which included problem solving skills and student's perceived opportunities to take responsibility and make decisions. In order to measure problem solving skills, students were presented with 3 one paragraph problems which asked students to list alternative solutions and to give reasons why they would chose particular

courses of action. This was assessed at the beginning of the semester and again at the end of the semester. The students responses were coded into 2 scales: cognitive complexity of reasoning and the degree of empathy shown with the interests of all persons affected by the solution. The results showed substantial decline between the pretest and posttest. Due to researcher's observations during the posttest, it was deemed that the decline was affected by the lack of interest of the students, and their failure to take this part of the testing seriously. These results were eventually deleted from the final results of the study. The other variables that were looked at regarding social development showed very little differences between the groups. There was significant change, although minimal, in the students' sense of non-school social responsibility and social competence.

Students have little opportunity to test and apply the information that they have acquired in high school . Conrad and Hedin (1981), advocates of experience based education, conducted a study in an effort to find hard evidence that would support the implementation of experiential education in the school system. They tested 4,000 students from a variety of experience-based programs, in the areas of social and psychological development, as well

as intellectual and academic development. In the latter area, students were

tested using the Problem-Solving Inventory and were asked for self-reports on

learning. They also gathered information using observations , student journals

and case studies of individual students. In the area of problem solving,

neither, the control or experimental groups showed significant gains between

the pre and posttest. One group did show significant gain in the area of

alternatives and consequences. This program was considered unique in that

the students faced problem situations that were similar to those in the testing

situation. Problem solving was a central focus in the seminars at this school.

The heart of the Problem Solving Index is the Empathy/Complexity Index,

which assesses the ability of the respondents to empathize with others. The

experimental groups showed an increase in this area.

Wagenaar (1987) discusses several aspects of successful programs for

those students who are at risk of dropping out of the formal schooling

process. Specifically, he states that a combination of in-school vocational

training with community based work experiences is particularly beneficial in

that is helps these students develop appropriate social contacts as well as

provides an alternative environment for students to expereince some

accomplishment. Buckman and Brand (1983) found that students who participated in these experience-based career education programs gained as much or more than other students on tests of academic knowledge and tests of career-related skills.

The National Institute of Education (1975) conducted a study of 600 youths in community based learning programs. They looked at career maturity and basic skills to determine if these students were able to achieve the necessary foundations in learning that they would achieve in a traditional school environment. The students made significant gains in basic skills using standardized achievement tests, as well as significant gains in career maturity using the Career Maturity Inventory. The gains in both areas were greater than those students tested in the traditional school environment over the three year period during which the study was conducted. During that time, the particpating programs graduated 260 students, 65% of which attended college and 35% were employed full time. This was greater than the percentages of those attending the traditional programs, although the authors didn't report the specific data.

Kourilsky and Ballard-Campbell (1984) looked at economic decision-making and student attitude toward school and learning in 180 students involved in mini-society instructional system. The mini-society is describes as an experienced-based approach to teaching which includes real worldlearning, not simulations or games. They found that significant gains were made in all areas, with no difference between the different ability groupings of the children. They attribute the similar outcomes between the varying abilities to the diverse learning skills where verbal skills don't dominate. A second explanation they offer is the relevance and uniqueness of the experience to children's personal lives.

Transfer of Learning

Transfer of learning occurs when learning in one context or with one set of materials impacts on performace in another context or with other related materials (Perkins, Salomon 1994). Transfer is a key concept in education since most formal schooling aspires to transfer. Usually the context for learning is in a structured classroom environment which differs dramatically from the context of application which would include at home and

in a work enviroment. Perkins and Salomon (1994) state that transfer only becomes interesting in situations where the transfer would not be thought of as ordinary learning. In other words, where the new situation is signifcantly different than the context within which the learning occurred.

Although schools have relatively successful in organizing and conveying large bodies of factual knowledge, students have had few experiences in the application of this learned knowledge to the real world, rendering most of this knowledge inert for many students (Collins, Brown, Newman 1987). Transfer of this body of knowledge doesn't always occur. Apprenticeship programs, as well as work-based learning can ameliorate this problem by providing real life experiences that will aid in the transfer of learning.

In discussing the variable of learning transfer, many definitions and discussions have been available through the years. In Thorndike's (1988) theory of "identical elements," he held that positive transfer occurred to the extent that the new task contained elements identical to those in the original learning task. This is consistent with Ausebel's theory of relevant learning

(1960). There are many other theories that refer to generalization that don't necessarily agree with this concept, such as generalized ideas about how to solve problems (Charles, 1976). Although there is no consistency in the definition, we do know that there are certain conditions that seem to maximize transfer (Charles, 1976), and with regard to school learning, this would be acceptable.

Charles (1976) summarizes a list of conditions that seek to maintain a high degree of transfer of learning. This list is as follows:

1. The curriculum should contain a high percentage of activities that are very lifelike, not phoney or contrived.
2. Students should understand the meaning and operation of what they are asked to learn.
3. The learning activities should provide practice in a variety of contexts. For example, multiplication learning should allow students to practice with real objects of various kinds, with abaci, with paper and pencil, mentally with eyes closed, as rapid means of addition, and so on.
4. Students should comprehend the purpose of everything they are asked to

learn - the possible uses, newer learning, made possible, etc.

5. Students should have numerous opportunities to directly apply what they have learned to realistic concerns.

6. Teachers should correlate or relate each discipline with the other ; for example, music and art with history.

Many of these conditions that Charles outlines are descriptive of work based learning and real world environments. Lifelike activities, meaningful learning, variety of activities to apply what has been learned are all conditions that quite often don't exist in the more traditional teacher-directed learning environments.

Kobus and Kwolek (1983) endorse these notions of activity oriented learning with meaningful relationships between the learner and the subject. These objectives are based on the Tyler - Taba rationale of curriculum development (Ornstein, Hunkins, 1993). Kobus and Kowlek discuss this in terms of the community based approach to global education. They refer to Becker (1982) who states that "what is needed is not so much to broaden knowledge, as to reinterpret it through an understanding of global

systems"(p.3-4). They feel that an approach that would most embody this philosophy would be a community based learning model. Learning would be based in the real world environment. The four criteria involved would include:

1. most directly and thoroughly embodies the concept of interdependence

2. fits the individual learner into this conceptual model of interdependence

3. emphasizes and give opportunity for personal practice of responsible decisions

4. views complex issues from an interdisciplinary perspective.

Community based learning provides the greatest opportunity for student involvement in immediately relevant curricular activities as opposed to abstract subject matter, typical of the formal structured classroom environment.

Meaningful Learning

Kember (1991) discusses the concept of deep versus surface learning, while referring to deep learning as being consistent with meaningful learning.

He lists several characteristics of what he describes as a deep approach to learning: interested in a task, searches for meaning, makes it meaningful toown experience and to the real world, and sees the relationship between this whole and previous knowledge. On the other hand, surface learning is describes as: a demand to be met, sees the task as unrelated to other tasks, is concerned about the time it takes to complete the task, avoids personal meanings the task may have, and relies on memorization. Kember (1991) states that in order for learning to be meaningful, students must not only Have a genuine understanding of the most important concepts, but should also be able to relate one concept to another. Ausebel (1960) developed the notion of advance organizers, which is used to reveal the links between concepts, or to bridge the gap between what the learner already knows and what the learner needs to know.

Goernert (1995) conducted a study using students enrolled in a beginning statistics course. Many of these students had felt that there was nouse for this requirement, since most of the material had no meaning. He taught hypothesis testing procedures using a familiar commercial from television, presenting the data as the advertiser had claimed. The students

were instructed to assess the validity of the claims made and found that important information had been omitted. The results of the study showed that when information had relevance to their lives, and was presented in a meaningful way, the students saw more need to emply statistical thinking when faced with decision making. Goernert also showed an increase in critical thinking skills, which may be consistent with other students in statistics courses.

CHAPTER III

DESIGN OF THE STUDY

Subjects

The subjects in this study were 110 adolescents between the ages of 15 and 19 years old who have been diagnosed as severely behavior disordered (SED) and who are now receiving special education services at private alternative schools in the Chicago metropolitan area. Students at these schools were referred by their own public school district because of the inability of the public school programs to control their behavior.

The majority of the students in these programs have been referred because of chronic assaultive behavior directed at peers and teachers, or chronic insubordination to school staff. A smaller group of students were referred because of their bizarre behavior: hallucinations, high rates of nonsensical speech, severe anxiety or withdrawal. Some of this latter group

31

had been hospitalized one or more times due to suicidal gestures or ideations. All of the students had numerous absences at their own school due to truancy, suspensions, illnesses, or frequent transfer among special education programs or between schools. In some cases, students had spent significant time in jails, hospitals or residential placements, so that their school history had been inconsistent.

Typically, all of the students demonstrated extreme deficits in appropriate social behavior and had great difficulty forming satisfactory relationships with others, whether peers or adults. Their interactions with other students ranged from withdrawal to intimidation and physical aggression, while their interactions with teachers and authority figures were characterized by defiance, verbal abuse, and attempts at manipulation. They failed to demonstrate responsible personal behavior (they often lost items, failed to turn in assignments, etc.), they often denied the presence of problems, and refused to accept responsibility for their behavior.

Subjects were selected on the following basis: all students of appropriate age and with potential for remaining in the programs through May were

invited to participate in the study and were given verbal and written explanation of the procedures. Potential stay in the program was based on current attendance and those without situations that may warrant their termination including graduation and requests for program changes. Those who agreed to participate and who had parent approval became subjects in the study.

Settings

The settings were four alternative programs for special education students in the Chicago suburban area. Two of the sites are described as traditional day school programs. Token economies govern most aspects of these programs, and students are grouped on the basis of their age and on the type of their behavior problems. Classroom instruction is provided on a combination of individual and group instruction, due to the wide range of students skill levels which might exist in a given classroom. Crisis intervention procedures include physical restraint and time-out. These techniques are used in lieu of out-of-school suspension or expulsion to prevent students from harming themselves or others, and to control outbursts

in the classroom. These sites will provide the control group data for this study. The other two sites are described as work-based learning programs, where the students are placed in apprenticeship settings, community classrooms and competitive employment, as well as in-house seminars. Although these programs don't utilize a token economy, they do provide minimal financial incentives for students to participate. Crisis intervention procedures include physical restraint, but there are no areas for time-out. These students can be suspended from the program for inappropriate behavior. When suspended, the student is expected to attend an alternative schooling site where they will be counted in attendance, and where time-out is available. The effect this may have on a student's apprenticeship or competitive employment is dependent on the worksite and employer. These sites were used for the experimental part of this study.

Measures

The purpose of this study is to determine if students can achieve the goals of our educational system, specifically in the area of critical thinking skills and personal qualities while learning in the workplace and community

as well or better than in a structured classroom setting.

There were three types of data that were looked at for the purpose of this study, scores taken on a pre and posttest of the Watson-Glaser Critical Thinking Appraisal, student attendance, and credit earnings. The scores on the Watson-Glaser Critical Thinking Skills Appraisal were used to look at the ability of students to think critically and solve problems. The student attendance patterns and credit earnings were used to determine if students can acquire the personal qualities necessary to possess higher level jobs. Although the SCANS Report (1993) includes other characteristics besides attendance and work completion under personal qualities, those characteristics were not looked at as they were not within the realm of this study.

The hypotheses tested in this study are as follows:

1. Students exposed to learning in the real world environment show no difference in the acquisition of critical thinking skills than those students exposed to learning in a structured classroom setting.

2. Students exposed to learning in the real world environment show no difference in attendance patterns than those students exposed to learning in a structured classroom setting.

3. Students exposed to learning in the real world environment show no difference in credit earnings than those students exposed to learning in a structured classroom setting.

The Watson-Glaser Critical Thinking Skills Appraisal is a multiple-choice test with 80 questions. The test takes approximately 45 minutes to administer and requires no special skills in the administration. There are five subtests and they are as follows: inference, recognition of assumptions, deductions, interpretation, and evaluation of arguments. The exercises include problems, statements, arguments and interpretations of data similar to those that are encountered on a daily basis in the classroom, at work, and in newspaper and magazine articles. The Appraisal calls for responses to two different kinds of item content: (1) items which have "neutral" content that deal with the weather, scientific facts, and other subject matter which people

generally do not have strong feelings about, and (2) items which have "controversial" content, such as politics, economic and social issues which provoke very strong feelings in most people.

The test has been normed on several populations including high school students, college students, police officers and nursing students. The norms for high school students were based on a sample of school districts that were selected with respect to geographic region and the size and socio-economic status of the communities. This included 24 high school districts in 17 states. Approximately 11% of the students were members of ethnic minorities, and gender was split equally (Watson, Glaser, 1980).

There are two forms of the appraisal. According to the publisher of the tests, empirical studies were conducted to verify that the two forms are equivalent. The reliability of the Appraisal was tested in several ways. Estimates were made of the internal consistency of the test, the stability of test scores over time, and the correlation between the alternate forms of the test. The degree of internal consistency was measured by calculating the split-half reliability coefficients which was .69 for ninth grade students. The

stability over time had a correlation of .73, and the correlation between the alternate forms of the test was .75. Buros states that although the two forms are equivalent, there can be as much as a six point difference. To compensate for this, each group will be split in two and will be given alternate forms during the pre and posttest.

Watson and Glaser determined that the validity of this type of test is a joint characteristic of the test and the purpose for which the test is being used. Evidence of the test's validity had been drawn from studies which had a variety of needs and purposes. Within instructional settings where teachers attempt to develop critical thinking skills, the extent to which this test measures a sample of the instructional objectives is an indication of construct validity. In other words, if this assessment is to measure critical thinking skills, experience in programs aimed at developing these skills should be reflected in changes in performance on this test. The authors of the test found this to be true in several studies. In an effort to determine correct responses or "the right answer" to such questions, Watson and Glaser submitted all items to a jury of 15 people trained in logic and scientific method. They showed perfect agreement as to the correct responses to all items. They urge that

scores for each subtest are not to be looked at separately, since the number of items in each subtest is relatively small and therefore, lack sufficient reliability.

Attendance patterns and credit earnings were looked at for the second semester, to determine if students in the treatment group have more of the personal qualities necessary to be productive on the job.

An analysis of variance procedure was done on the pretest scores of the students at the various sites to determine if the control and experimental groups differ from each other .

Procedures

Teachers and/or vocational counselors at each school administered the Appraisal to the subjects using alternate forms for the pre and posttest. This was done in small groups. The researcher was present during the testing times. At the end of the semester, data was collected regarding the student attendance and credit earnings.

CHAPTER IV

RESULTS

The purpose of this chapter is to present an analysis of the data collected,

including the results of the Watson-Glaser Critical Thinking Skills Appraisal,

the student attendance records and the student credit earnings for the semester

ending in June,1996. The student attendance and credit earnings represent the

personal qualities necessary to be productive in the workforce. This was a

quasi-experimental design which involved non-randomized treatment and

control groups.

Watson-Glaser Critical Thinking Skills Appraisal

The number of students tested during the pretest stage was 110. At the

time of posttesting, 59 students were available to participate. Students

dropped out of the study for various reasons including non-attendance,

hospitalization, incarceration or withdrawal from the program.

Approximately 5 students refused to posttest, although they were available.

Of the 59 students with completed data, 2 students were dropped for not

finishing the test. Reliabilities were checked on the individual responses

using Cronbach's alpha. These were found to be low. Using 2 forms of the

test, the reliability was checked for each form for pretest and posttest. The

initial results of these reliabilities are noted in Table 1.

Table 1. Initial Reliability of Watson-Glaser Across Groups

Reliabilities	Pretest A	Posttest A	Pretest B	Posttest B
N	29	30	30	29
Alpha	.2600	.5416	.5777	.3993
Standardized	.2792	.5289	.5957	.3989

After reviewing the inter-item correlations, the items that negatively

correlated with the total score were omitted and the reliability was rechecked.

This left an average of 51 items per test that were retained for analysis. They

are described in Table 2.

Table 2. Reliability Following Removal of Items Negatively Correlated

Reliabilities	Pretest A	Posttest A	Pretest B	Posttest B
N	29	30	30	29
Alpha	.7616	.8255	.8029	.7807
Standardized	.7608	.8219	.8100	.7824

Reliabilities were also checked on the individual subtests using Cronbach's Alpha. These were all low, which is consistent with the other populations for which this test has been normed. The publisher of the test states this to be the case since there are so few items in each subtest.

An analysis of covariance was performed using pretest scores as a covariate, to determine if the two groups were similar at the pretest stage since it was not possible to randomly assign students to each of the groups. Alpha was set at .05. The results showed that the two groups did not differ significantly, indicating that there was no group bias in the pretest scores that may affect the interpretation of the posttest results. The control group had a mean of 21.60714 and the experimental group had a mean of 21.96552, with f=.848 showing no significant differences at the .05 level. The posttest means

were 22.6071 and 25.7931, respectively. Although a t-test value of .088 shows no significant differences on the posttest, the average gain of the treatment group was 4 times that of the control group with a gain of 3.8276 and a standard deviation of 8.107, compared to a gain of 1.00 and a standard deviation of 7.434 for the control group.

Hypothesis 1: Students exposed to learning in the real world environment show no difference in the acquisition of critical thinking skills than those students exposed to learning in a structured classroom setting.

This hypothesis was not rejected, therefore showing that there was no difference in the acquisition of critical thinking skills between the two groups. This was not rejected based on the p value of .088.

Personal Qualities

Student absences for the control group had a mean of 11.2143 with a range of 0-44 and a standard deviation of 10.411during the four month period of this study. The treatment group had a mean of 15.6552 with a range of 0-

42 and a standard deviation of 12.254. The credit earnings for the control group had a mean of 2.8886 with a range of 0-4.0 creidts and a standard deviation of .685. The treatment group had a mean of 4.5345 with a range of 1.75-8.0 and a standard deviation of 1.335. The length of the study included 88 school days. A summary of these results are shown in Table 3.

Table 3. Absences and Credit Earning Means

	N	Absences	Credits
Control Group	30	11.2143	2.8866
Treatment Group	29	15.6552	4.5345

Hypothesis #2: Students exposed to learning in the real world environment show no difference in attendance patterns than those students exposed to learning in the structured classroom setting.

This hypothesis was not rejected. Students showed no significant difference in attendance patterns between the two groups, based on the p

value of .073.

Hypothesis #3: Students exposed to learning in the real world environment show no difference in credit earnings than those students exposed to learning in the structured classroom setting.

This hypothesis was rejected, and the alternate hypothesis that students exposed to learning in the real world environment did show a difference in credit earnings from those students who were exposed to learning in a structured classroom setting. Refer to Table 4. This was rejected based on a p value of .000, which shows a significant difference between the two groups.

Correlations Among Experimental Variables

The correlations between the critical thinking skills and personal qualities, that is student absences and credit earnings for each group are seen in Tables 4 and 5.

Table 4. Control Group Correlation Coefficients

	Absences	Credits
Pretest	-.0502	.0816
Posttest	.1146	.0442
Gain	.1799	-.0295.

Pretest and posttest scores were not correlated significantly with absences

and credits. The students that scored low did not gain fewer credits.

Table 5. Treatment Group Correlation Coefficients

	Absences	Credit Earnings
Pretest	-.0100	-.0121
Posttest	-.1619	.4450**
Gain	-.1257	.3788**

**signicicance at the .05 level.

The treatment group showed a significant correlation at the .05 level between

posttest scores and credit earnings, as well as gain scores and credit earnings.

These were the only significant correlations noted.

CHAPTER V

DISCUSSION

This chapter will address the four questions listed earlier in this study.

Research Questions

Research Question #1: Can students acquire the critical thinking skills,
as outlined by the educational system, in a real world environment versus a
structured classroom environment?

The treatment and control groups were considered to be similar in their
ability to think critically at the beginning of the semester as shown by the
results on the Watson-Glaser Critical Thinking Skills Appraisal. The two
groups had means of 21.9 and 21.6, respectively. At the end of the semester
the treatment group had shown a gain of four times that of the control group,
although this was not a statistically significant gain. The students are able to

gain the ability to think critically at least the same, if not better in a real world environment as they are able to do in a structured classroom setting. Many of these behavior disordered students become stressful and/or anxious in testing situations, since this isn't a method of assessment that has been utilized in their current settings. Students may also perceive testing negatively as it has not been a good experience for many of them in the past. Testing has been used to place them in special education, as well as to remove them from their home school setting. Paper and pencil tests may have negatively influenced the lack of participation and motivation on some students during the course of this study. In addition, such measures do not adequately capture the small individual changes, or the critical incidents associated with real world experiences.

Research Question #2: Which approach to instruction shows more promise for increasing students' skills in this particular area?

This is a difficult question to answer given the similarities in posttest scores in the area of critical thinking skills. The assumption could be made that both approaches to instruction, traditional and work-based learning, show

promise for increasing student skills in this area. More research will need to be done in this area to better determine the more effective environment for increasing student ability in the area of critical thinking skills. This will be further discussed later in the chapter.

Research Question #3: Do specified alternatives to conventional teaching practices contribute as effectively to student learning as the more traditional approaches to teaching?

Alternatives to conventional teaching contribute at least as effectively to student learning as the more traditional approaches. The similarities in critical thinking skills before and after treatment that involved work-based learning and real world environments show that this can be as effective as sitting in a teacher-directed classroom. It is unclear whether the treatment negatively influenced student attendance patterns. The students did show an increase in credit earnings, although the influence of the learning environment may have been more indirect than direct. This will be explained further in the next section of this chapter.

Another factor that may influence the results of critical thinking skills in the traditional behavior disordered classrooms is the presence of a highly structured behavior management system that reinforces responsible and appropriate behavior in the students. Students are taught to be less impulsive and are reinforced for thinking before acting. There is also a system of appeal for what students perceive to be negative consequences that have been unjustly imposed, either because they feel they are innocent or because they feel that others were involved. This system of appeal, or meetings as they are frequently called, are granted once the student has controlled their behavior for a specified length of time and after they have completed some of their work. This is to insure that they are as reasonable and calm to discuss the incident, and to reduce the likelihood of the student losing control. This approach to behavior management in programs for behavior disordered students may increase problem solving skills of these students as they are reinforced for finding alternatives to acting out and aggressive behavior.

Research Question #4: Does work-based learning provide students with the personal qualities necessary to be productive members of the workforce, as outlined by the SCANS report published by the U. S. Department of

Labor?

The students in the traditional structured classroom environment averaged 11.2 absences per semester as compared to 15.6 absences for the work-based learning group. Yet the work-based learning students averaged more credits per semester at 4.5 compared to 2.8 for the other group. This could be a dilemma for some employers who expect good work attendance although these students may be more productive while on the job. The fact that these students earned more credits with lower attendance can be seen as somewhat peculiar. The principal at one of the treatment programs stated that school districts allowed for accelerated credit earnings at these sites. The reason given for this was that these programs are more expensive than the traditional, and that the sooner the student catches up on credits, the sooner the student will graduate. The school district will then be relieved of any future responsibilities toward that student. Another issue to consider is that in the traditional special education programs, accelerated credits are not allowed as typical special education curriculum is often seen as watered down and not at the same level as the regular education counterparts who may have similar academic abilities. This may or may not be the case depending on individual

programs and individual teaching styles. Accelerated credits in these situations would seem suspect.

Lower rates of attendance among the treatment group was a surprise which appears to have very little explanation. One possibility would be that in the traditional programs, a highly structured reinforcement system that incorporates attendance as a reinforceable behavior may account for the better attendance. This may counter those theories that would suggest that relevant learning and real life expereinces may motivate the students to do better, although it may have had an impact on work completion. At the high school level, many students may be motivated when they are able to see progress toward earning credits. Absences were not noted as being work days or classroom days. It may be that students attended worksites and community sites, but not the classroom sites.

Conclusion

In conclusion, the data in this study shows that real world expereinces can have a positive influence on the academic achievement of behavior

disordered students. The students in work-based learning programs earned significantly more credits toward their high school graduation requirements than their counterparts in the traditional classroom setting. Although this data did not suggest any other benefits, further research is needed to explore the influence of real world experiences on this population of students.

There is a low prevalence of behavior disordered students in today's schools, thus making it difficult to conduct research on this population of students (Ruhl, Berlinghoff 1992). The severity of this population is such that they haven't been receptive to most treatments resulting in such restrictive environments as residential treatment settings and private day schools. An added dimension to this difficulty is the generally uncooperative behavior of the child who is often labeled behavior disordered. The problem with a pretest - posttest design is testing enough students to insure an adequate sample size at the end of data collection. These students tend to be more transient and inconsistent in their school attendance than those students who are classified as having other disabilities. Reasons for this inconsistency include community problems that lead to incarceration, or relocation to a relative's home. Also included are hospitalizations, dysfunctional families,

drug and alcohol abuse, as well as uncooperative and acting out behavior.

Other problems associated with this particular study included lack of student motivation to test properly. Food was provided as a reinforcer to test, but this didn't insure that students read the problems. As this researcher observed the testing situations, it was sometimes clear when a student wasn't testing seriously and the results were omitted, and the student wasn't asked to posttest. There may have been some students that didn't read the questions before answering when it was not so obvious. There also may have been students who tried their best to test well, but did not have the reading ability to comprehend the test questions. This should be considered in further research when looking at this particular population. There tends to be a wide range of academic abilities within each classroom. Because the academic components are addressed on an individual basis, this wouldn't interfere with the regular curriculum, but would interfere in a testing situation. It would have been difficult to have a large enough sample size if reading abilities were limited to ninth and tenth grade levels.

Transition to productive adulthood continues to be a difficult process for

the behavior disordered student. These particular students tend to have significant problems living independently and earning competitive wages, as well as those who continue to have difficulty living within the community. The school curriuclum needs to incorporate the plans necessary to address these problems, specifically in the areas of critical thinking and problem solving skills. These are some of the skills needed in order for behavior disordered students to improve their chances at a successful and productive adulthood, specifically in the area of employment. Better measurement techniques are necessary to insure that students are learning what we think they are learning. Behavior disordered students have a long history of academic underachievement and poor problem solving skills.

Transition programs for behavior disordered students have accompished a great deal over the past few years. They have been examples of a new and progressive paradigm for educating children and adolescents, particularly those with behavior disorders. It is time to take a look at the goals and objectives of these programs to insure that they are consistent with what is going on in the world outside of the school system.

<u>Further Research</u>

The findings of this study are suggestive of further research. First is the development of procedures to teach critical thinking and problem solving skills to these students. Second, does the use of highly technical token economies influence the ability to think critically in behavior disordered students while in alternative settings. There exists the possibility that behavior disordered students who are enrolled in programs where token economies and structured behavior management systems are utilized, are learning to think critically and solve problems through this system.

A third area to consider for research would be a replication of this study where a measurement is used that does not involve a paper and pencil test. Behavior Disordered students are often anxious over testing situations. This is related to testing situations that have led to their removal from the regular curriculum, or removal from the home school building. Many of these students have experienced academic problems throughout their schooling, and may have associated testing with poor grades and feelings of failure. The assessment procedures in both the traditional settings and work-based learning programs have not included paper and pencil tests. This study should also involve at least a full school year with pretesting in the fall and

postting at the end of the second semester. This would allow for more

opportunity to show potential of the program, as behavior disordered students

Disadvantaged Students." In *Teaching Advanced* don't show gains as quickly

as the regular population of students.

A fourth area of research to consider is to compare the critical thinking

skills in a high academic functioning group of behavior disordered students

with their regular education peers to determine if academic ability is related to

the ability to think critically. This could also be done in comparison with

students who have other disorders such as learning disabilities.

A fifth area to explore would be the employability benefits of work-

based learning sites. Are these students more likely to have their careers on

track as a result of this programming? How many of these students are

enrolled in postsecondary training or college? Do these students lead more

productive adult lives, and if so, what factors contribute to this? More insight

is needed into how work-based learning can enhance the goals of the school

curriculum.

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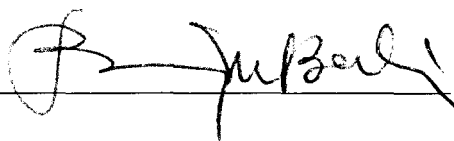Associate Professor, Education
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The dissertation is, therefore, accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Education.

September 13, 1996

Date   Director's Signature