

THE RELATIONSHIP BETWEEN DESIRABLE  
TEACHER COMPETENCIES AND YEARS OF TRADE EXPERIENCE,  
YEARS OF TEACHING EXPERIENCE, AND TEACHER TRAINING  
OF TRADE AND INDUSTRIAL TEACHERS IN VIRGINIA

by

Arthur Wiley Mullins

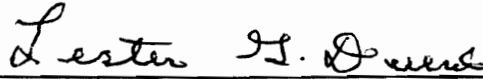
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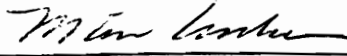
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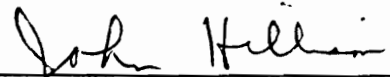
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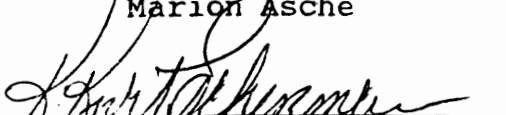
Vocational and Technical Education

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(ABSTRACT)

The purpose of this study was to describe the relationship between ratings of desirable teacher competencies and selected personal and professional variables of the trade and industrial (T&I) teachers in Virginia. The variables were correlated and analyzed in order to explain the variance of teacher competencies.

The independent variables were years of trade experience, years of teaching experience, levels of professional training, and reasons for teaching. The dependent variables were the total ratings of the 17 competencies, as evaluated by the teacher's immediate supervisor, and three categories of the competencies: teacher preparation, delivery of instruction, and support of appropriate vocational organizations.

The sample in the study consisted of 130 randomly selected T&I teachers from 74 comprehensive high schools and vocational centers across the state of Virginia. Data were collected by mailing the evaluation instrument and teacher

questionnaire to the teacher's immediate supervisor. Eighty-seven percent (87%) of the mail surveys were returned.

The sample was described by the number of years of trade experience, the number of years of teaching experience, the number of college hours with Vocational prefix, other college hours, and reasons for entering the teaching profession. Frequencies, means, and standard deviations were obtained.

The reasons for teaching which were ranked as first and second choices were a desire to work with young people and interest in their trade. The data were analyzed by using correlations and multiple regression. Findings revealed that:

(1) No significant correlations exist among the independent variables and the dependent variables.

(2) Nothing can be gained by partialing out the variance in the dependent variable.

Thus, the ratings of the T&I teachers by their immediate supervisors were not dependent upon the variables of years of trade experience, years of teaching experience, or hours of postsecondary professional training.

## Dedication

The work of this study is lovingly dedicated to the memory of my father, Wiley Mullins, who guided me at an early age, helping me to set high individual goals, and who endured personal sacrifices in order for me to begin my college career and to my mother, Patsy Mae Mullins, who gave moral support throughout this endeavor.

## Acknowledgements

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The author wishes to thank the expert committee for their assistance and advice in developing the competency list for the instrument. Also thanks is given to the division superintendents, school administrators, and teachers who allowed this study in their schools, classrooms, and laboratories.

To the many friends and colleagues who inquired, prodded, and encouraged, many thanks.

Finally, I would like to thank my family for continued support. My son, Shaun, was very patient while I was involved in this study. My sincere appreciation is extended to my wife, Maxine, for her support and encouragement in completing this study. Her many hours at the computer were invaluable in putting this research study into print.

## Contents

	Page
Abstract . . . . .	ii
Dedication . . . . .	iv
Acknowledgements . . . . .	v
List of Tables . . . . .	ix
Chapter 1. Introduction . . . . .	1
The Problem Area . . . . .	2
Purpose of the Study . . . . .	5
Limitations of the Study . . . . .	9
Definitions of Terms . . . . .	10
Summary . . . . .	14
Chapter 2. Review of the Literature . . . . .	15
Teacher Effectiveness . . . . .	15
T&I Teacher Effectiveness . . . . .	16
Reasons for Teaching . . . . .	17
Teacher Evaluation . . . . .	19
Rating Instrument . . . . .	21
Teacher Competencies . . . . .	22
Trade Experience . . . . .	27
Teaching Experience . . . . .	31
Professional Training . . . . .	32
Rating Scales . . . . .	35
Summary . . . . .	37
Chapter 3. Methods and Procedures . . . . .	39

Design of the Study . . . . .	39
Population and Sample . . . . .	40
The Instrument . . . . .	44
Development . . . . .	44
Expert Review . . . . .	44
Reliability . . . . .	46
Pilot Study . . . . .	48
Data Collection Procedure . . . . .	48
Analysis of the Data . . . . .	51
Statistical Analysis . . . . .	52
Summary . . . . .	54
Chapter 4. Presentation and Analysis of the Data . . . . .	55
Description of the Sample . . . . .	55
Trade Experience . . . . .	56
Teaching Experience . . . . .	56
College Hours . . . . .	59
Reasons for Teaching . . . . .	59
Descriptive Statistics . . . . .	64
Dependent Variables . . . . .	67
Correlations among the Variables . . . . .	72
Multiple Regression Analysis . . . . .	77
Findings Related to the Research Questions	79
Summary . . . . .	82

Chapter 5. Summary, Conclusions, and Recommendations . . . . .	85
Summary of the Study . . . . .	85
Problem . . . . .	85
Conclusions . . . . .	87
Trade Experience . . . . .	88
Teaching Experience . . . . .	89
Professional Training . . . . .	90
Reasons for Teaching . . . . .	92
Discussion . . . . .	93
Recommendations . . . . .	96
References . . . . .	98
Appendices . . . . .	108
VITA . . . . .	140



## List of Tables

Number	Name	Page
1.	Number of T&I Teachers in Comprehensive High Schools and Vocational Centers and in Rural and Urban Areas in Virginia . . . . .	43
2.	Results of the Pilot Study Showing Reliability of the Instrument . . . . .	49
3.	Number of Forms Mailed and Number and Percentage of Forms Returned . . . . .	53
4.	Classification of Teachers . . . . .	57
5.	Years of Trade Experience . . . . .	58
6.	Years of Teaching Experience . . . . .	60
7.	Distribution of Vocational College Hours (Vocational prefix) . . . . .	61
8.	Distribution of College Hours other than Vocational Hours . . . . .	62
9.	Reasons for Teaching . . . . .	65
10.	Trade Experience, Teaching Experience and Hours of College Training, Descriptive Statistics . . . . .	66
11.	Frequencies and Descriptive Statistics for Competencies and Total Scores of the Teacher Evaluations . . . . .	69
12.	Means and Standard Deviations for the Competency Subsections . . . . .	71
13.	Frequencies and Descriptive Statistics for Designated Competencies, Showing Location and Type of School . . . . .	73
14.	Correlation between the Variables . . . . .	75
15.	Correlation between Independent Variables and Three Sections . . . . .	76
16.	Results of Multiple Regression Analysis . . . . .	78

## Chapter 1

### Introduction

As the decade of the 1990s began, a great deal of attention was being given to accountability in education, from both the business community and taxpayers. Today, accountability may also take the form of the emphasis that is being placed upon mastery of the basic academic skills, as well as upon acceptable competence in each occupational area.

Through the media we are constantly being made aware of falling test scores, the superiority of products from overseas sources, or more efficiency in foreign workplaces. Large amounts of money and time are invested in the United States by individuals, businesses, and school systems, and many believe they have a right to know that their investments will assist in producing young adults capable of entering the work world upon completion of their public education.

One major investment made in behalf of a school system is the initial selection and training of teachers for trade and industrial education (T&I) programs. Teachers of T&I subjects are most often employed directly from the work world and issued provisional certificates. The professional teacher training of provisional certificate teachers follows

on an inservice basis. Recertification is the same as that required for degreed teachers.

After entering the teaching profession, craftspersons generally do not expect to return to the workplace to earn a livelihood. It is, therefore, imperative that all those involved in the process of selecting personnel for T&I education have access to as much background information about teacher candidates as possible. Thus, administrators will be able to make the most appropriate choices in selecting T&I teachers.

Trade experience, teaching experience, reasons for wanting to teach, and credits earned in professional education courses are believed to have a bearing upon the quality of performance in the T&I classroom and laboratory (Duenk, 1990d; Swartz, 1974). This study was initiated to determine the relationship of the aforementioned variables to the teaching performance of T&I educators. Chapter 1 delineates the problem, reviews the purpose and limitations, and provides definitions of terms appropriate to the study.

### The Problem Area

As early as 1917, the Smith-Hughes Act recognized the need for quality vocational teachers, as well as the desirability of having experience in the occupation (Roberts, 1971). The provisions of the act specified that only persons with sufficient work experience should be

allowed to teach in federally funded programs. The act provided funding for professional training of vocational teachers in agriculture, trades and industry, and home economics (U.S. Congress, 1917).

In ensuing years several federal acts provided additional funds for other areas of vocational teacher education and contained similar requirements for experience in an occupation. Federal legislation which has recently expanded funding for vocational education includes the Vocational Education Act of 1963, the Carl Perkins Act of 1984, and, currently, the Carl D. Perkins Vocational and Applied Technology Education Act of 1990.

The department of education in each state has been delegated the responsibility of preparation and certification of teachers, with special provisions for endorsement in the occupational or educational specialty taught. In Virginia, local school divisions have the final authority to hire personnel for T&I teaching positions who meet the minimum Virginia requirements of a high school diploma or equivalent, plus two years of Department of Education approved work experience beyond the learning period designated for a specific trade and completed within the past 10 years (Duenk, 1989).

A major concern of an administrator of a vocational program is the initial selection of teachers who will

possess the qualities needed to conduct successful programs in specific trade areas. Unlike most other vocational personnel, T&I teachers are usually hired directly from industry with little or no professional training. Colleges and universities then provide assistance in designing programs for initial certification and staff development. Therefore, these institutions are also interested in the needs of local school divisions as they relate to professional training.

Of interest to both the local school division and the training institution is the argument over the importance of the amount of trade experience and academic preparation to teaching success and the degree to which each should be considered as criteria for T&I teacher selection. Research indicates that some administrators support a broad occupational background with limited academic preparation, while fewer advocate a strong academic background with limited occupational preparation (Duenk, 1990b).

The National Commission on Secondary Vocational Education, in its report, The Unfinished Agenda (1984), recommended that all students have access to course offerings that integrate academic and vocational topics. Guidance programs have the responsibility to assist students in assessing their interests and aptitudes as they relate to curriculum choices.

Silberman, Herr, & McDaniels (1991) discussed the recommendations and changes stemming from the recommendations. Silberman, in his comments, stated, "Vocational teachers are adding academic content and asking their students to do more reading, writing, math and science" (p. 30).

Because of public reaction to these recommendations, curricula were modified in many vocational, as well as academic programs. Many states have increased graduation requirements, particularly in academic areas. Secondary vocational enrollment has declined (Gray, 1991), and many students prefer pursuing higher education after high school. Gray indicated that the decline in vocational education enrollments may be due to the aforementioned factors.

In times of national/state economic recession, many experienced craftspersons become unemployed, providing a greater selection to fill vacancies in T&I programs. An increase in the variety of technical occupations, greater demands for academically integrated instruction, and the costs of teacher training make the selection of T&I teachers a special area for consideration.

#### Purpose of the Study

Because new demands have been placed upon teachers within the vocational area and because of the method of selecting and training T&I teachers, more information is

needed by those involved in employing new teachers to fill positions which become vacant or are created because of changing technology. Some new tasks which T&I teachers may be expected to perform include (a) instruction in computer technology, (b) use of computers in the laboratory area, (c) special instruction for special needs students in their T&I classes, (d) documentation of performance objectives, and (e) perfecting human relations skills (Lewis, 1991).

Yuen (1985) stated, "The challenge to instructors is to introduce and integrate microcomputers into the instructional setting in such a way that will allow them to operate effectively and yield as many benefits as possible" (p. 51). Stern and Gathercoal (1986) provided a case study of a mentally retarded student in a woodworking class as an illustration of the need for involvement of industrial teachers in developing an individualized education plan (IEP). Such tasks are not encountered by prospective teachers in most areas of industrial employment. Hence the need for new and different preemployment skills is apparent.

Following selection for T&I positions, teachers need specific training which is costly to the teacher, the local education agency (LEA), and, perhaps, the T&I education institutions. Therefore, information is needed which will enable the administrative personnel to choose persons who

will, with proper education, best fill vacancies within the school system.

The purpose of this study was to determine the relationship among years of trade experience, years of teaching experience, levels of professional education, amount of pedagogical instruction, reasons for wanting to teach, and competencies of the effective teacher of T&I education, as assessed on a rating scale administered by the teacher's supervisor. The teacher competencies selected were related to teacher preparation, delivery of instruction, and support of related youth and professional organizations.

Information was gathered that will assist the administrator in charge of personnel to assess potential for success in the teaching of T&I programs before the decision for hiring has been finalized. With adequate information, the administrator will be able to make the most appropriate choice of teachers of T&I education, thereby assuring a quality program and fiscal responsibility.

In addition, improvement of instruction and more appropriate inservice for employed teachers should be a result of the study. If those teachers receiving a higher rating on the competencies possess more formal education, additional inservice programs on selected topics will be



recommended for presently employed teachers who may be lacking appropriate academic competencies.

Assistance will be given to T&I education institutions and to the Virginia Department of Education in providing information to better assess the need for revising/upgrading teacher certification requirements. If the study reveals a relationship between designated areas of concern, recommendations can be made to local school divisions and/or the Virginia Department of Education to revise hiring practices and certification requirements, based upon more or less trade experience, previous teaching experience, formal education, or reasons given for desiring to enter the teaching profession. Furthermore, this study will aid in determining the application which can be made at various levels within the educational system, and, in this situation, the industrial community.

The study will provide answers to the following questions:

(1) What proportion of the variance in teacher competencies, as rated by vocational administrators, is accounted for by each of the following variables?

Amount of trade experience

Amount of teaching experience

Level of professional training

Teacher training (Vocational prefix)

### Other college courses

#### Reasons for wanting to teach

(2) Which of the aforementioned variables are the best predictors of teacher competence in the T&I education program?

#### Limitations of the Study

This study was limited to full-time T&I teachers in the public secondary schools and secondary vocational centers of Virginia. Certain groups of teachers were eliminated from the study due to special and unique characteristics which differed from typical T&I teachers. Teachers of health occupations, teachers of the disadvantaged and handicapped students in the T&I programs (as non-mainstreamed students), teachers of related subjects, and teachers of prevocational programs were not included.

Only those types of teaching experiences accepted by the Virginia Department of Education as years of experience in public schools, private schools, and universities were included in the study. Years of experience in the armed services were not considered except in situations where such trade or teaching experiences met state certification requirements.

For this study, the assessment performance of competencies within the classroom setting was evaluated by the teacher's immediate supervisor. Therefore, the

limitation of the instrument in having an unbiased appraisal by the immediate supervisor also affected the study.

### Definitions of Terms

For this study, the following definitions pertain to the terminology used:

Advisory committee: A group of persons, usually outside the educational profession, who are chosen for the purpose of giving advice and counsel to the school regarding the vocational program (Virginia Department of Education, 1987).

Area vocational center: A public school which has been approved by the State Board for Vocational Education to provide instruction in the occupations (other than professional occupations) to residents of a designated geographic area, usually larger than one local basic administrative unit (United States Department of Education [USDE], 1984).

Classroom: The physical facility which houses the laboratories and/or spaces for lectures, demonstrations, and other developmental activities for the T&I student (Swartz, 1974).

Competency: A specific knowledge, ability, or value position that a teacher either possesses or does not possess, which is believed to be important to success as a teacher (Medley, Coker, & Soar, 1984).

Comprehensive high school: A secondary school with a number of departments (English, mathematics, business, T&I, etc.) which offer a diversified program to meet needs of pupils with varying interests and abilities (USDE, 1984).

Curriculum: The plan of activities engaged in by the learner for the purpose of meeting an occupational objective, such as classroom activities, laboratory studies, student organization, and/or study trips (Roberts, 1971).

Evaluation: A term used in education to indicate the procedure for determining effectiveness of instruction (AVA, 1989).

Public secondary school: A school enrolling students in grades 9-12 and operated by publicly elected or appointed school officials in which the program and activities are under the control of these officials and which is supported primarily by public funds (USDE, 1984).

Rating instrument: The instrument for determining teacher performance in the classroom or laboratory (Erickson & Wentling, 1976).

School administrator: Principal or assistant principal of a comprehensive secondary school or vocational technical center, or director of a vocational technical center where T&I programs are offered (Swartz, 1974).

Supervisor: The professional person responsible for the development and implementation of instruction of T&I programs in a school district (Swartz, 1974).

Teacher certification: Virginia State Board of Education requirements which mandate that a teacher has met the qualifications and standards to perform appropriate instructional activities (Duenk, 1989).

Teacher competence: The repertoire of competencies a teacher possesses. The teacher who possesses more competencies is determined to be more competent in mastering the instructional process (Medley et al., 1984).

Teacher competency: A specific knowledge, ability, or value position that a teacher either possesses or does not possess, which is believed to be important to success as a teacher (Medley et al., 1984).

Teacher effectiveness: The results which a teacher gets. It is defined in terms of what pupils do, not what the teacher does or can do (Medley et al., 1984).

Teacher performance: What the teacher does on the job. It is defined in terms of teacher behavior under a specified set of conditions. How well a teacher performs depends in part on how competent the teacher is and in part on the situation in which the teacher performs (Medley et al., 1984).

Teacher performance rating: Scores given by administrators to teachers on competencies listed on the rating instrument.

Trade: An industrial occupation requiring skill in a [designated] range of activities. A trade may be considered skilled or semiskilled (Good, 1966).

Trade and industrial education: A phase of vocational education that provides instruction in the basic skills, knowledge, and attitudes required for useful employment in trades and industrial pursuits (Roberts, 1971).

Trade and industrial teacher education courses: Graduate or undergraduate college level courses designed specifically to upgrade the skills of T&I teachers (Duenk, 1989).

Trade and industrial education teacher: A person employed by a school division to impart industrially related knowledge and occupational skills to youth in the public schools (USDE, 1985).

Vocational education or vocational education courses: The total number of semester hours of credit earned by the teacher in undergraduate or graduate courses which deal with the philosophy, history, psychology, content, and pedagogy of vocational education (Swartz, 1974).

Years of teaching experience: Periods of teaching employment, as determined by the Virginia Department of

Education. A year of teaching experience is defined operationally as a 9, 10, 11, or 12 month contract period for instructional services (Swartz, 1974).

Years of trade experience: The number of calendar years of employment beyond the normal learning period (apprenticeship) for a given occupation in either a commercial or industrial setting, or in government service (Swartz, 1974).

### Summary

The purpose of the study was to determine the relationship among years of trade experience, years of teaching experience, hours of postsecondary education (including both professional education and technical education courses), reasons for teaching, and competencies of effective teachers in T&I education. The limitations of the study were given, and definitions were listed. In chapter 2, literature related to the topic will be reviewed.

## Chapter 2

### Review of the Literature

In the previous chapter, the reason for undertaking the study was given, as well as the questions which the study attempted to answer. The limitations, together with definitions for consideration, were explained. In chapter 2 a review of related literature is presented.

Local school boards have the authority to hire teachers in the T&I education field. Vocational administrators generally have the opportunity to make recommendations to the board. Inasmuch as the T&I students in our schools today will be workers and T&I teachers of tomorrow, it is important that the most competent teachers be employed to teach the youth of our nation. Local administrators need knowledge of the qualities of T&I teachers that will give the most assurance that qualified persons are selected to fill positions in this field of education.

#### Teacher Effectiveness

In a world of high technology, a need exists for the most competent teachers, capable of imparting technological knowledge and occupational skills to youth and adults. Ryans (1960) stated that teacher effectiveness was dependent partially upon the attributes of the teacher and partially upon the teaching situation. The variables operating in each situation determined the degree of effectiveness.



There were some teachers who could presumably be successful in any community, while others could succeed in very limited situations, or perhaps not at all, due to poorly developed teaching behaviors.

Medley (1977) indicated that research in teacher effectiveness was much more difficult and expensive to do well than research in most aspects of the educational process. A number of sound reviews can be found, but whenever teacher educators attempt to sift through these research findings, they find the task so difficult and time-consuming that they can scarcely be blamed if they abandon it. The literature on the subject is vast and inaccessible, and much of it is difficult to comprehend and evaluate.

Further investigations attempted to clarify the predictability of teacher effectiveness. For example, Olstad, Beal, Noe, and Schaefer (1983) attempted to identify variables that might predict success in student teaching performance at Washington University. While secondary school participants yielded mixed results, elementary participants showed only two possible predictors of teaching success.

#### T&I Teacher Effectiveness

Research involving teacher effectiveness showed that many skills and techniques are specific to T&I education. Gleazer (1968) found that vocational-technical education

teachers must command the esteem of their students and fellow teachers, as well as the respect of craftspersons, engineers, technicians, and other professionals with whom they came in contact. Classroom effectiveness, it was found, as well as laboratory productivity, required unique skills and attributes.

Cline (1977) identified specific factors which contributed significantly to teacher effectiveness and which were important in selecting, employing, and promoting T&I teachers. Those factors included interaction between behavior changes and the teacher and student.

Dubravcic, Chinien, and Pratzner (1986) reported current issues regarding teacher effectiveness and factors which affected quantity and quality of vocational education teachers. Strategies for improvement of teacher recruitment, selection, and certification were also presented.

Bridges (1984) and Duckett (1985) showed that teacher effectiveness can be described. Additionally, Murphy (1985) and Moss (1989) reviewed unique skills and attributes which are required for T&I teacher effectiveness.

#### Reasons for Teaching

While studying teacher effectiveness, one topic which surfaced was a person's reasons for entering/remaining in the teaching profession. In 1980-81, the National Education

Association (NEA, 1982) conducted a study in which selected teachers were asked to choose three reasons (from the list of 19 items) for entering the teaching profession. Those reasons which were cited most frequently were: (a) a desire to work with young people, (b) interest in a subject matter field, (c) the value or significance of education in society, (d) the influence of a teacher or advisor in elementary or secondary school, (e) the influence of family, (f) long summer vacation, (g) job security, and (h) never really considered anything else.

In the aforementioned study, those teachers under age 30 cited a desire to work with young people and long summer vacations as primary reasons for entering the profession. Interest in subject matter was selected more often by teachers under age 40 than by older teachers.

Bradley and Friedenbergl (1987) described T&I teachers' expectations when they leave business or industry:

They look forward to sharing their skills and knowledge. They want to help others enjoy success in occupational life. They also look forward to new and even higher levels of prestige as professional educators. Thus, they usually approach their newly chosen profession with optimism and enthusiasm (pp. 19-20).

However, this enthusiasm, they reported, may soon be turned into stress when it is determined that the skills and knowledge which they used in the work place are now insufficient to meet the increasing and stressful demands of the T&I classroom. These demands include helping handicapped and disadvantaged students master entry-level job skills, keeping current with the technology of their trade, emphasizing the safe use of equipment and tools, and keeping proper discipline.

In the Harris and Wittkamper (1986) study, a majority of teachers discussed needs which were more idealistic than practical. While the usual economic conditions were included (laid-off, medical problems, need for more money), the self-actualization needs were reflected upon by a majority of the teachers interviewed. Examples of the idealistic needs included: desire to work with young people, having a challenge, or trying something new.

### Teacher Evaluation

Teacher evaluation, its purposes, types of evaluation, and the person responsible for performing the evaluation related to the study. Hawley (1983) stated that local and state school boards often mandated some form of teacher evaluation in response to public demands for accountability. Thorndike and Hagan (1961) had earlier related evaluation to

measurement, but had also stated that evaluation includes both informal and intuitive judgments.

Stufflebeam (1971) described evaluation as "the process of delineating, obtaining, and providing useful information for judging decision alternatives" (p. 40). Each of these definitions concerned conclusions based upon information gathered in an orderly, systematic fashion.

Research indicated that evaluation by superiors was a sound method of research. Teacher evaluation was seen as a primary function in the leadership role of the school principal, according to the American Association of School Administrators (AASA) report, Evaluating Educational Personnel (Lewis, 1988). The report further stated that many evaluation procedures attempted to define effective teachers and teaching, with little emphasis placed upon outcomes of instruction.

In The Tentative Report -- Evaluation of Personnel (1972), it was reported that it was the responsibility of local school officials to obtain an estimate of teacher effectiveness in order that decisions on retention, promotion, salary, or upgrading teachers might be accomplished. Most administrators were responsible to a local board of education in the assessment of teacher performance by reference to locally defined objectives.

Medley (1977) also researched the notion that "decisions about a teacher's career -- about passage through preservice training, certification, promotion, recertification, and so on -- should be based on demonstrated competency to perform in ways that an effective teacher performs" (p. 15). This conceptualization was the forerunner to an investigation of the competencies of effective teachers.

Medley et al. (1984) maintained that teacher evaluation is a subjective judgment. The process of evaluation was based on the assumption that the evaluator knows what good teaching is and can recognize it when it is seen.

#### Rating Instrument

During a search of the literature, efforts were made to locate an appropriate rating instrument. A vast amount of research on teacher evaluation existed, with various scales and observation checklists (Medley et al., 1984).

Performance Based Teacher Education (American Association for Vocational Instructional Materials, 1992) materials were used to evaluate designated components of vocational programs, either by self-evaluation checklists or inservice evaluation checklists. Safety scales, lab management scales, and curriculum scales were three examples of the modules for which these checklists may be utilized.

However, few of these rating scales and checklists were designed specifically for use in a T&I setting, and none were uniquely applicable for use in this study. Therefore, the advice of a panel of experts in the area of T&I education was solicited in the development of the assessment instrument.

### Teacher Competencies

Many studies have been conducted concerning teacher competencies. A study of Ohio's full-time T&I teachers indicated that most teachers were employed and began teaching vocational classes with very limited professional training. The T&I teachers' needs differed from other beginning teachers because they were usually more mature, had a wide variety of work experiences, and usually had family obligations. Since they were already occupationally competent, they needed to develop teaching competencies without delay or frills (Reese & Orr, 1967).

Larson (1971) identified three major competencies as being essential for individuals desiring to successfully teach industrial courses: (a) knowledge of subject matter in the specialty, (b) work experience in the specialty, and (c) competency in teaching and relating to students. He concluded that individuals may be highly competent in their specialties with excellent work experience and still be poor teachers.

Shoemaker (1971), in addressing the Fourth General Session of the T&I Division of Ohio's Vocational Association, suggested that the ability of a teacher to encourage students' learning was more closely related to occupational competencies than to the number of professional hours of training. However, Gorman (1971) maintained that "the number of experienced craftsmen in any one trade area who also possess the potential to make good instructors is limited" (p. 43).

Halfin (1977) stated that teachers need certain competencies known as "survival skills." More recently, Duenk (1990c) contrasted a beginning non-degreed teacher changing from "a producer of goods and services to being an educator who has the job" (p. 56) of providing knowledge, attitudes, and skills to learners for entry into the world of employment. He stated that 24 states require survival skills workshops as necessary for T&I teacher certification (p. 64).

Terry and Davis (1980) identified a variety of competencies which were essential for "survival" in the T&I education classroom. These competencies were recommended as part of an orientation program in the Standards for Excellence (USDE, 1984) literature review and included:

1. Application of principles of learning to teaching.



2. Application of methods and/or techniques of teaching vocational subjects.
3. Ability to analyze an occupation.
4. Ability to develop a weekly instructional plan.
5. Preparation of a lesson plan.
6. Development of instructional sheets and their effective use.
7. Preparation of teaching aids, their use and limitations.
8. Effective use of audio-visual aids in the classroom.
9. Ability to teach at students' levels and rates of learning.
10. Selection of instructional materials and references suited to students' levels and interests.
11. Ability to select appropriate jobs and other learning activities based on students' needs, aptitudes, interests and abilities.
12. Evaluation and recording of students' achievements.
13. Maintenance of progress charts and records of individual student achievement.
14. Development and implementation of a safety program.
15. Utilization of safety practices in teaching the operation of equipment.

16. Development of students' attitudes toward safe practices and safety-consciousness in job performance.

The above competencies are included here and incorporated into the study so the reader might contemplate the comprehensive abilities which a teacher must bring to the T&I classroom. Many of these competencies may best be achieved through more formal education rather than inservice work.

Camp & Hillison (1984), in relating Prosser's 16 theorems to vocational education as it existed in the United States in 1984, supported the concept of more formal education for vocational teachers as they reviewed Bloom's taxonomy of educational objectives. They concluded that "vocational education should systematically include mastery of higher level cognitive skills in its curriculums....The ability to make judgments about changing situations, synthesize solutions to new problems, and evaluate the results is becoming increasingly important in the workplace" (p. 18). These are competencies which must be taught and evaluated by beginning T&I teachers within the classroom and laboratory, before the student moves to the workplace.

Detwiler (1985) stated that industrial and technical education teachers needed something more than their occupational experiences in order to educate others. Classroom management skills and methodology were often cited

as appropriate skills for teachers. Today's employers want individuals who are trainable (e. g., proper work ethics, interpersonal skills), and they will provide on-the-job training as needed (Gray, 1991). Workplace literacy should include the abilities to diagnose and solve problems, to make decisions, and to work productively with others. The expertise to teach these skills to high school students and adults in the T&I classroom/laboratory would usually not be obtained from occupational experiences, but from professional training after employment within a school system.

A 1987 study of the attitudes of experienced vocational agriculture teachers conducted by Hedges and Papritan revealed eight ingredients for excellence in teaching: motivation, interest in the student, a positive attitude, performance evaluation, keeping technically up to date, goals or directions, use of community resources, and having a high-quality occupational experience program for each student.

While these attributes were found to be appropriate for vocational agriculture teachers, additional research revealed similar findings for T&I educators. Duenk pointed out the need for a specialized type of T&I certification. He stated that a teacher

is required to be an efficient planner of a methodology consisting of analysis, curriculum development, safety,

laboratory management, discipline standards, youth club management, evaluation of students, and advisory committee involvement. Novice vocational teachers also need to improve their speaking, writing, and mathematics skills, since most of them have not been in a classroom since high school. (Duenk, 1990c, p. 57)

Probert (1981) described a project conducted in Pennsylvania to design a statewide system for establishing a regional pool of qualified teachers for potential staffing of local vocational training programs.

#### Trade Experience

The argument has been made that college graduates could not deliver to their students the actual working atmosphere of the factory or shop. The students would, therefore, find the real world different from their school experiences. Little support has been given to this argument among administrators, however, and the opposite viewpoint is historically supported in the literature.

The Smith-Hughes Act and subsequent legislation included provisions based upon the premise that effective vocational education must provide training in a learning environment similar to the atmosphere of the workplace (Roberts, 1971). These requirements were founded upon Prosser's sixteen theorems, three of which are:

2. Effective vocational training can only be given where the training jobs are carried on in the same way, with the same operations, the same tools, and the same machines as in the occupation itself...

7. Vocational education will be effective in proportion as the instructor has had successful experiences in the application of skills and knowledge to the operations and processes he undertakes to teach...

11. The only reliable source of content for specific training in an occupation is the experiences of masters of that occupation (Prosser & Allen, 1925, pp. 195-203).

Also in support of this premise, Shoemaker (1971), in a study conducted at Ohio State University, found that the only factor showing a significant positive correlation with student achievement was the number of years that teachers had spent in the occupation before they became teachers.

Leighbody (1972) reported that T&I educators have always believed that competence in the subject matter can only be obtained by experience on the job. The assumption was that craftspersons can be converted into teachers.

Branter (1974) indicated that the conversion of craftspersons into teachers may take place by the process of awarding college credit for work experience as part of the major for bachelor's degree candidates.

Swartz (1974) studied a stratified random sample of 72 T&I teachers in Virginia using performance ratings. His findings indicated that increased trade experience significantly increased classroom teaching performance ratings, as rated by the teacher's supervisor, as well as by self ratings.

Welch and Garner (1976) stated that increased work experience and the competence of a teacher do not always mean an increase in performance on the part of the students. However, a study conducted by Hux (1980) supported the Swartz findings that increased work experience of teachers resulted in increased competence in an occupational area.

A later project, authored by Loos (1982), investigated the degree to which vocational teachers acquire new knowledge and skills from part-time work experience outside the educational field and the impact of this experience on teaching and learning within the classroom or laboratory. Even though this study dealt with part-time employment while teaching, tremendous skill achievement was indicated for students who participated in the program.

The Standards For Industrial Arts Programs (American Industrial Arts Association [AIAA], 1983) indicated that work experience requirements of T&I teachers ranged from a minimum of one year to a maximum of eight years. Additional information from this survey showed an increase across the

United States in the occupational experience required for full certification of T&I teachers, with 12 states requiring from 1 to 5 years more than was required 5 years prior.

The 1985 Standards for Excellence in Trade and Industrial Education (USDE, 1985) reported that in order for vocational students to successfully compete in the market place, union practices, work rules and environments, OSHA regulations, and a wide variety of other working conditions must be communicated to the students. It was only through personal occupational experience of the teacher that this knowledge could be obtained and transferred to the students before employment.

In a later study Duenk (1990d) found that all states and territories required some work experience for employment as a T&I teacher. The amounts of on-the-job experience varied from a minimum of 2,000 clock hours to 16,000 clock hours depending upon the level of educational attainment (high school/GED, postsecondary level in occupational specialty, and baccalaureate level).

The value of work experience was related to success in scores achieved on the National Occupational Competency Testing Institute (NOCTI) competency examination in the T&I area. Duenk (1990d) stated that Virginia Polytechnic Institute and State University (VPI&SU), since 1972, has granted college credit for 30 semester hours for successful

completion of the exam. Currently, as an additional measure of competence in a trade area, 29 state departments of education recognize the NOCTI (or equivalent) as a measure of competency for granting certification (Duenk, 1989).

The assumption that increased occupational experience would result in higher competency levels in the trade areas was widely held among T&I educators. On the other hand, Welch and Garner (1976) maintained that the amount of teacher work experience did not necessarily result in an increase in student achievement and performance on an examination of occupational competency. There is, therefore, a need for more research concerning work experience as it relates to increased competence in the T&I classroom.

#### Teaching Experience

At all levels of education, the years of teaching experience is valued, with additional salary provided for the more experienced professionals. This attention to beginning and experienced teachers is also reflected in the literature related to T&I teachers and teacher performance.

The Tentative Report -- Evaluation of Personnel (1972) indicated that experience was important in the improvement of teaching performance for the first five years, after which there was a leveling off. After 15 to 20 more years,



teaching performance began to decline, regardless of the amount of teaching experience.

Swartz (1974), in comparing performance ratings of vocational industrial teachers with low teaching experience and those with high teaching experience, found no significant differences when analyzing ratings given by administrators, supervisors, teacher-peers, teachers on a self-rating, and students, when all data was analyzed together.

Harris and Wittkamper (1986) studied 35 T&I teachers from 14 different occupations who had recently entered the teaching profession after working five or more years in industry. These authors called the transition from industry to the education setting a "mid-life career change." The implication from their study was that administrators responsible for hiring new personnel should inquire as to the amount of previous industrial teaching experience and the applicant's insight about this experience.

### Professional Training

Traditionally, teacher certification requirements of states have required a baccalaureate degree as the minimum for general education teachers. Many T&I degree programs, however, emphasize only technical content, thus identifying teachers by their own specialties. This technical content often is not available in teacher training colleges, but

work experience requirements tend to decrease as college hours in a specialty increase. Warner (1984) found that in six states persons with no college credit needed to present evidence of at least five years of work experience. With a degree, the level of work experience dropped to three years.

While some T&I teachers desire a four-year degree only for personal satisfaction, Leighbody (1972) stated that "it is not likely that the members of any profession can, in the future, enter that profession without at least a baccalaureate degree, and vocational education must soon meet this standard for all of its teachers as it now does for most of them" (p. 140).

Leighbody (1972) further stated that to prepare the student for effective living, learning, and working, teaching requires advanced education beyond subject matter competence. Swartz' findings (1974) supported this statement. He found a significant relationship between the professional education level and T&I content educational level of the teachers studied.

Whereas T&I teachers gain trade competencies from work experience, research indicated that certain teaching competencies could be obtained only from academic experiences. Baker (1977) maintained that T&I teacher preparation and certification practices must be changed to require some preservice and inservice teacher education

courses for craftspersons before they may be certified to teach.

Vos (1989) agreed, stating that T&I teacher certification requirements fail to reflect current or future professional needs for successful teaching in our changing society. He maintained that T&I teachers need to be able to teach thinking, reasoning, and communication skills as well as occupational competencies. Current standards have failed to encourage higher levels of professional development and growth.

In an attempt to determine the most appropriate teacher training, Doerfort (1989) compared two different methods of teacher preparation and the results obtained on the National Teacher Exam Core Battery Tests. The study included 15 beginning agriculture teachers in Ohio who had prepared for teaching by the traditional teacher education method and 51 beginning T&I education teachers who had prepared by the industry route. Regularly prepared teachers scored higher in the communication skills, general knowledge, and professional knowledge components of the test than those who were industry-prepared. The amount of professional education received accounted for the largest portion of variance in each of the dependent variables.

Duenk (1990b) concluded that research has revealed an understanding among administrators, teacher educators, and

state department of education personnel that an increase in college preparation for teachers in secondary T&I programs was becoming more highly valued. Examples were given of additional courses which were recently required by colleges for preparation of degreed T&I teachers.

The literature contains a variety of articles related to the value of including professional courses in the requirements for state certification of T&I teachers. Likewise, many of these articles reiterate the value of requiring technical content in the coursework.

#### Rating Scales

Three techniques for teacher evaluation were normally used: ratings, observations, and measurements of student gains (Medley et al., 1984). Ratings consisted of an overall estimate of teacher effectiveness or of separate evaluations of specific teacher behaviors and traits. Ratings involved ranking percentage of efficiency, indication of the level of a trait, or forced choice. Judgments based on teacher observations and informal observations of student gains were usually included in ratings.

Cruickshank (1986) reported that two approaches, each reflecting different eras in the history of research on teaching, have attempted to identify effective teachers. Prior to 1960, the primary focus was on identification of

teacher traits or characteristics considered exemplary from the view of the administrator or supervisor.

In determining the effectiveness of ratings of teacher performance, Barr (1948) studied a variety of teacher rating instruments. He determined that variables which related to reliability of rating instruments might be the differences of concepts of teaching effectiveness, varying amounts of training in processing data, and different levels of professional expertise in using evaluative techniques.

Howsam (1960) described problems with rating scales, stating that the items were derived subjectively, often by personal bias. He further related that a well-developed rating instrument, with clear descriptions of the characteristics and behaviors to be observed, could increase reliability.

Cruickshank (1990) reported that with the dawning of the 60s researchers of teacher effectiveness approached evaluation in a new light. Attention was turned to specific teacher behaviors present or operative when students were succeeding. A second significant development in the study of teacher effectiveness was the use of instruments to record specific classroom behaviors, thus permitting systematic analysis of what was said or done by a teacher and/or student.

Stake (1967) suggested that a need existed for more formal evaluation, such as use of checklists, comparisons, and scheduled visits. He concluded that those measures were superior to informal evaluation methods based on casual, unscheduled observations reflected in previous studies.

Medley (1977) later stipulated that research in teacher effectiveness was much more difficult and expensive to do well than research in most aspects of the educational process. Borich and Madden (1977) concluded that the process-product method of evaluation had identified effective teaching behaviors.

Medley et al. (1984) indicated that "the first-line supervisor" would play the role of teacher evaluator in the near future. He further reported that a high level of inference had formerly been utilized by the rater. With structured observations, the recorder now looked for a specific behavior and recorded it when observed. This structure of observations resulted in lower measures derived from inference by the recorder.

### Summary

The review of literature indicated that teacher effectiveness can be measured and that many skills and teaching techniques are unique to T&I educators. Trade competencies of T&I teachers may be enhanced by work

experience, but further investigation was suggested by some of the investigators.

## Chapter 3

### Methods and Procedures

The purpose of this study was to determine the relationship between competencies of effective teachers in trade and industrial education, as assessed on a rating scale administered by the teacher's supervisor, and other variables that may have an effect on these competencies. Chapter 1 presented an introduction to the study as well as definitions of terms. Chapter 2 reviewed the literature related to the topic under consideration. Related literature also presented a relationship between dependent and independent variables as stated by other researchers.

This chapter contains a description of the design of the study, the population and sample, the instrumentation, data collection procedure, analysis of the data, and a summary.

#### Design of the Study

This study was designed as descriptive survey research. Kerlinger (1986) stated that survey research "studies large and small populations (or universes) by selecting and studying samples chosen from the populations to discover the relative incidence, distribution, and interrelations of sociological and psychological variables" (p. 377). The procedures and methods of this type of research have been



developed and improved primarily by economists, psychologists, sociologists, and statisticians.

Using the questionnaire as the survey instrument, the participants were described by years of trade experience, years of teaching experience, amount of professional training, and reasons for teaching. These items became the independent variables in the study. The dependent variables were the total score on the rating scale describing the competencies of the teacher and scores on three areas of competency--teacher preparation, delivery of instruction, and support of youth and professional organizations.

The study also utilized correlational and multiple regression analysis. Borg (1981) stated that multiple regression analysis is a procedure that employs multiple regression to study relationships between several independent variables and one dependent variable. Kerlinger (1986) stated that multiple regression analysis is a method for studying the effects and magnitudes of the effects of more than one independent variable on one dependent variable, using principles of correlation and regression.

#### Population and Sample

Using the Directory of Trade and Industrial Education Programs in Virginia (Virginia State Department of Education, 1991), the school systems with vocational administrators who had direct responsibility for evaluation

and supervision of T&I teachers were selected. Schools with designated vocational administrators (urban and rural schools, vocational centers, comprehensive high schools, and joint district centers) were considered.

A total of 105 schools across the state of Virginia met this criterion, and teachers of T&I subjects in these schools were the population. These 105 schools were divided as to the type of school (48 comprehensive high schools and 57 vocational centers) or as to the location (82 rural schools and 23 urban schools).

The second step in determining the population was the enumeration of teachers from each of the target schools. Those teachers who were full-time teachers in the public secondary schools and vocational centers were included in the pool for selection. Teachers of health occupations, teachers of the disadvantaged and handicapped (as non-mainstreamed students), teachers of related subjects, and teachers of pre-vocational programs were not considered.

All teachers who met the selection criterion from each of the selected sites were assigned a number. There were 768 teachers of T&I subjects included in the pool. Using a computer generated list of random numbers, 130 teachers were selected. These teachers were later eliminated from the selection process for the pilot study.

Ary, Jacobs, and Razavieh (1979) suggested that a sample of between 10% and 20% of the population be selected in descriptive statistics (p. 135). The 130 teachers in the sample represented 16.9% of the population.

To assure a proportionally stratified sampling, a matrix was devised to include comprehensive high schools and vocational-technical centers, arrayed with schools designated as rural and urban in location. Schools located in areas with population over 100,000 were designated as urban. (Designation of schools as urban was based upon information from the University of Virginia Center for Public Service. See Appendix A.)

This matrix was then examined to determine if the rate of selection for the sample of 130 teachers was appropriate. Table 1 presents the information for the population ( $N = 758$ ) and for the sample ( $n = 130$ ). In order to assure that no school had a disproportionate number of teachers, no more than three teachers from each site were selected for the sample. The rate of selection was appropriate for a proportional sample, as each type of school in both urban and rural settings was represented in the study in proportions approximating their numbers in the population.

Table 1

Number of T&I Teachers in Comprehensive High Schools and Vocational Centers and in Rural and Urban Areas in Virginia

Type	Location	
	Rural	Urban
<b>Comprehensive H. S.</b>		
Number	181 (23.5%)	65 (8.5%)
Selected	32 (24.6%)	14 (10.8%)
<b>Vocational Centers</b>		
Number	361 (47.0%)	161 (20.9%)
Selected	63 (48.5%)	21 (16.1%)
<b>Total</b>		
Number	542 (70.5%)	226 (29.4%)
Selected	95 (73.1%)	35 (26.9%)

Note. Grand total, N = 768 (Virginia Department of Education, 1991)

## The Instrument

### Development

In developing the instrument for use in determining the relationship between the teachers' years of trade experience, years of teaching experience, formal education, reasons for teaching, and the competencies of the effective T&I teacher, a list of competencies was compiled. Using the Beginning Teacher Assistance Program (BTAP) of the Virginia Department of Education, performance ratings found in various doctoral dissertations, and the Virginia Department of Education, T&I division's listing, 16 competencies believed to be appropriate to the study were identified.

### Expert Review

The list of the 16 selected competencies was reviewed by the panel of experts, consisting of one teacher educator, one assistant state supervisor of T&I (retired), three T&I teachers, three local vocational directors, one vocational research professor, and three vocational center principals (see Appendix B). Each member of this panel was aware of competencies needed by T&I teachers.

In a cover letter, the members of the panel of experts were asked to review the competency list and to make suggestions for revisions. Each reviewer was asked to check "Yes" or "No" as to the appropriateness of each listed competency as a quality needed by successful T&I teachers.

Space was provided for comments and for additional competencies to be listed if the panel member desired to make suggestions (see Appendix C).

Each of the 16 competencies was approved as being appropriate for T&I teachers. In addition, three members of the panel of experts suggested that a competency related to the proper care and storage of tools be added. Revisions of the instrument were then made on the basis of the committee members' recommendations, thus assuring content validity for the rating instrument.

The revised rating instrument contained 17 items to assess the selected teachers' performance. The scale for evaluation included: 1 (never), 2 (sometimes), 3 (usually), and 4 (always), with 1 being the least desirable and 4 the most desirable rating. Each item included descriptions, either questions or statements, to help explain the meaning of each competency (see Appendix D).

Medley (1977) stated that the evaluation instrument should be descriptive, with the bulk of the items focused on classroom management and effective teaching behaviors. Descriptors of teacher performance should be provided for clarity. He stated that the response mode should be, at the very least, a Likert-type response.

In addition to the rating instrument, a questionnaire to collect demographic information was developed. The

questionnaire was also reviewed by two members of the panel of experts who made no suggestions for change (see Appendix E).

### Reliability

The next step in the process was to estimate reliability of the instrument. Kerlinger (1986) defined reliability as the accuracy or precision of a measuring instrument: "If we measure the same set of objects again and again with the same or comparable measuring instrument, will we get the same or similar results" (p. 405)? To determine the extent of the reliability of a measuring instrument, various techniques may be utilized.

Ary, Jacobs, and Razavieh (1979) stated that an estimation of reliability could be obtained by correlating scores received by the same individuals on different occasions or with different sets of equivalent items. The "test-retest" or "equivalent-forms" reliability requiring two administrations of one instrument or an equivalent form was unacceptable in this study. Other procedures for estimating reliability, according to the authors, included "split-half reliability" and "rational equivalence."

To estimate the reliability of a test without splitting the items and employing correlational techniques, several formulas have been developed. The procedures estimate reliability by determining how all items on a single test

relate to all other items and to the test as a whole. The most convenient of these procedures utilizes the Cronbach Coefficient Alpha, which was selected for this study.

To calculate the reliability, one determines the variance of all the scores for each item. These variances are then added across all items to obtain the sum of the variances of item scores (Ary, Jacobs, & Razavieh, 1985).

#### Cronbach Alpha Formula

$$\alpha = \frac{n}{n-1} \left( 1 - \frac{\sum \sigma_i^2}{\sigma_x^2} \right)$$

n = number of items on the instrument

$\sum \sigma_i^2$  = sum of the variances of the item scores

$\sigma_x^2$  = variance of the test scores (all n items)

From the list of previously selected teachers, after randomly choosing the 130 for the study, a list of 30 was compiled as an appropriate sampling of T&I teachers to whom to administer the rating instrument for the purpose of determining reliability. The superintendents of the school systems where these teachers were employed were contacted, seeking permission for the study (see Appendix F).

Responsible personnel in several school systems in the state of Virginia responded by letter or by phone. If no



negative response was received from a school system, the pilot study proceeded. One school system's supervisor of instruction responded negatively, and no further contact was made with that system. Since three teachers had been selected from this system, a total of 27 teachers were available for determining the reliability of the instrument.

#### Pilot Study

A packet containing a letter explaining the purpose of the survey (see Appendix G), one copy of the rating instrument, and an envelope for the return of the material was then sent to each administrator whose name was included in the pilot study.

Upon return of these surveys, values assigned to each item were transferred to sheets to be scanned by the Measurement and Research Service at VPI&SU. The total scores were then used to calculate the reliability coefficient, using the Cronbach coefficient alpha. Reliability of the three scales was determined, as well as the reliability of the total instrument. The results of the reliability study are presented in Table 2. The results of the pilot study show that the instrument is reliable for the intended purpose.

#### Data Collection Procedure

A total of 130 teachers, with no more than three

Table 2

Results of the Pilot Study Showing Reliability of the Instrument

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Competency Category	Coefficient Alpha
I. Teacher Preparation	
Items #1 through #4	0.60
II. Delivery of Instruction	
Items #5 through #14	0.82
III. Support of Organizations	
Items #15 through #17	0.76
Total Instrument	0.84

---

teachers from each school, represented 74 vocational education sites for the purpose of obtaining ratings on their teaching competencies. Performance ratings were obtained from the immediate supervisor of each teacher selected.

All surveys were conducted by mail and sent to the place of employment of each rater, during the period from September 20 to October 15, 1992. Each evaluation packet included letters to the principal and teachers (see Appendix H), the rating instrument to be completed by the rater, the questionnaire to be completed by the ratee, a return envelope, and postage. As an incentive for prompt response, two quarters were attached for each principal and each teacher, with the invitation for the respondent to have a soft drink or coffee while completing the form. Each rating instrument was numbered to identify which forms had been completed and returned.

Following a three-week period to allow for responses, follow-up procedures were begun. A second letter was mailed to those who had not returned the rating instruments (see Appendix I). One week later, a phone call was made to each administrator who had not responded.

The following information was gathered for each teacher:

1. Years of trade experience. Twelve months were counted as equivalent to one year.

2. Years of teaching experience in the public or private schools. Any grade level from kindergarten to college level was accepted, including experience in the armed services.

3. The extent of professional training. The teachers were asked to list the number of hours of postsecondary professional training, as methodology and teacher education courses (Vocational prefix) or other courses.

4. Reasons for wanting to teach. The respondents were asked to select three reasons from a list of seven reasons for teaching. These reasons were ranked, with first choice marked "1" and second and third choices marked accordingly. The eighth choice was "Other," and the respondents were asked to specify their reason if this was one of the choices. If a reason was not marked as first, second, or third choice, it was coded as "zero".

#### Analysis of the Data

Upon receipt of each performance rating and questionnaire, the forms were scanned to determine completeness of the information. Those which contained incomplete items were returned for the needed information. Because the importance of answering each item was stressed in the instructions, only two forms had to be returned.

Table 3 shows the number of forms mailed and the number and percentage of returns.

Results of the ratings were tabulated using the Number Cruncher Statistical, 5.1, (NCSS) computer package, with the score for each item rechecked for accuracy. All data analyses were conducted under the supervision of a research consultant at VPI&SU.

The goal of the analysis of the data was to answer the research questions presented in chapter 1 through descriptive techniques and stepwise multiple regression analysis. Means, standard deviations, and frequencies of the demographic make-up described the sample of the T&I teachers included in the study.

#### Statistical Analysis

The first research question asked: What proportion of the variance in teacher competencies, as rated by vocational administrators, is accounted for by each of the included variables: years of trade experience, years of teaching experience, hours of professional training (vocational and other), and reasons for teaching. The teacher competencies related to preparation for instruction, delivery of instruction, and support of youth and professional organizations. The second research question asked: Which of the aforementioned independent variables are the best predictors of competence of T&I teachers?

Table 3

Number of Forms Mailed and Number and Percentage of Forms Returned

Type of School	Number Mailed	Number Returned	Percentage
Comprehensive H. S.	45	34	75.6%
Vocational Center	85	80	94.1%
Rural	95	91	95.8%
Urban	35	23	65.7%
Total	130	114	87.7%

Stepwise multiple regression was used to determine the variance of competencies of successful T&I teachers which can be explained by the personal and professional characteristics and training of the teachers. Zero-order correlation coefficients among the variables were examined for possibility of multicollinearity.

The basic prediction equation of this study was the following:

$$Y' = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4, \text{ where}$$

$Y'$  = predicted Y scores, dependent variable (the sum of scores of the ratings on the competencies),

$a$  = intercept,

$b$  = regression coefficients, and

$x$  = independent variables ( $x_1$  = years of trade experience,  $x_2$  = years of teaching experience,  $x_3$  = level of professional training, and  $x_4$  = reason for teaching).

### Summary

Chapter 3 has reviewed the methods and procedures used in the study, including the design of the study and descriptions of the population and the instrument. Chapter 4 presents the findings and results from the analysis of the data, and chapter 5 will include the conclusions and recommendations.

## Chapter 4

### Presentation and Analysis of the Data

In today's media, we often see that much emphasis is being placed on accountability in education, including mastery of basic skills, new technology, and transitional plans from high school to college and to the workplace. A keystone in all the programs is the teacher, the training involved, and the proficiency of teacher performance. This is also true in areas of T&I education.

This study was initiated to determine the relationship of the years of trade experience, years of teaching experience, the amount of postsecondary education, and reasons for wanting to teach in T&I education, and the competence of T&I teachers as rated by their supervisors. Chapter 4 presents the findings of the study by first giving a description of the sample, followed by the outcomes of the statistical procedures.

#### Description of the Sample

Packets of materials were mailed to principals of 74 schools and included letters and survey forms for 130 teachers. Table 3 has previously presented the rate of return, indicating that information was received from 114 teachers and their respective supervisors, making a rate of 87.7% of usable questionnaires and principal evaluations. These T&I teachers were full-time teachers in Virginia,



excluding teachers of health occupations, the disadvantaged and handicapped (as non-mainstreamed students), related subjects, and prevocational programs.

The sample ( $n = 114$ ) of this study was comprised of 34 T&I teachers from comprehensive high schools and 80 teachers from vocational centers. The sample, when delineated by location of schools, was composed of 91 teachers from rural school divisions and 23 from urban school divisions. The matrix shown in Table 4 displays the numbers when arrayed to show each category.

#### Trade Experience

The subjects were asked to give the "number of years trade experience for which you received credit when your Virginia teaching certificate was first issued." The amount of trade experience of the respondents when they began teaching a T&I subject varied from 0 years to 25 years. The mean was 9.29 years, and the standard deviation was 6.07.

Seven subjects began work with no trade experience, but it appeared that four of those had college degrees in vocational education. Table 5 displays the distribution of the teachers' trade experience.

#### Teaching Experience

The teachers ( $n = 114$ ) were asked for the number of years of teaching experience for which they presently

Table 4

Classification of Teachers (n = 114)

---

Type of School	Location		Total
	Rural	Urban	
Comprehensive H. S.	30	4	34
Vocational Centers	61	19	80
Total Teachers	91	23	114

---

Table 5

Years of Trade Experience (n = 114)

Number of Years	Number of Teachers	Percentage
0 years	7	6.14
1-5	30	26.32
6-10	36	31.58
11-15	19	16.67
16-20	18	15.79
21-25	5	4.39
Total	114	100.00

Note:      Mean = 9.29      Standard Deviation = 6.07

receive credit on their school system's pay scale. This amount varied from 0 to 35 years of teaching, with a mean of 15.03 years and a standard deviation of 8.09.

Three teachers who were selected were beginning teachers, and two of those had no college hours. Seven others had less than four years of teaching experience, and each of those had experience in a trade. One held a degree and the others had some vocational college hours. The distribution of years of teaching experience is shown in Table 6.

#### College Hours

Postsecondary college training for the teachers in the sample was designated as those hours related to methodology and teacher education (with Vocational prefix) and other college hours. Vocational hours varied from 0 hours to a maximum of 90 hours, while other college hours varied from 0 hours to 160 hours. As shown in Table 7, 82.46% of the teachers in the sample had 30 hours or less of college hours with the vocational prefix. Table 8 presents the distribution of "other college hours," indicating that 71.93% of the teachers in the sample had 30 hours or less of college hours without vocational prefixes.

#### Reasons for teaching

The teachers were asked to select and rank three reasons for wanting to teach, with number 1 as the greatest

Table 6

Years of Teaching Experience

Number of Years	Number of Teachers	Percentage
0 years	3	2.63
1-5	14	12.28
6-10	17	14.91
11-15	25	21.93
16-20	25	21.93
21-25	21	18.42
26-30	8	7.02
31-35	1	0.88
Total	114	100.00

Note.            Mean = 15.03            Standard Deviation = 8.09

Table 7

Distribution of Vocational College Hours (Vocational prefix)

Number of Hours	Number of Teachers	Percentage
0 hours	11	9.65
1-10	25	21.93
11-20	43	37.72
21-30	15	13.16
31-40	6	5.26
41-50	1	0.88
51-60	9	7.89
61-70	0	0.00
71-80	2	1.75
81-90	1	0.88
91+	1	0.88
Total	114	100.00

Note.      Mean = 20.69      Standard Deviation = 19.47

Table 8

Distribution of College Hours other than Vocational Hours

No. of Hours	No. of Teachers	Percentage
0 hours	39	34.21
1-10	15	13.16
11-20	17	14.91
21-30	11	9.65
31-40	4	3.51
41-50	8	7.02
51-60	1	0.88
61-70	1	0.88
71-80	2	1.75
81-90	1	0.88
91-100	3	2.63
101-110	1	0.88
111-120	2	1.75
121-130	2	1.75
131-140	4	3.51
141-150	1	0.88
151-160	2	1.75
Total	114	100.00

Note.      Mean = 30.03      Standard Deviation = 42.79

influence on their professional choice. The choices were:

1. A desire to work with young people
2. Interest in my subject matter
3. The value which society places on teaching
4. Job security
5. Long summer vacation
6. The pay is pretty good
7. A former teacher encouraged me to teach
8. Other (please specify)

Each of the three reasons selected by the participating teachers received either a 1, 2, or 3. Those reasons not selected were labeled 0 for the tabulations. Reasons number 5 and 6 received no ratings of 1, and reason number 3 received only 1 first choice and 1 second choice.

The respondents were allowed an eighth choice, "other," and 23 people chose to write their own reasons. Among the reasons given under the "other" category were (a) benefits which were not available in the salon, (b) making a positive difference, (c) health - elbows going bad, (d) too much time traveling and spent away from family, (e) former navy instructor - liked the profession of conveying information and watching former students succeed, (f) escalating the standards of training in the profession, and (g) availability when physically unable to continue electrical work.



Finally, one teacher summarized the reason as, "I have had a great desire to teach the building trades to young people for several years now. I enjoy sharing my knowledge of this industry with young people. I have found this job to be very rewarding. It feels great to know that you can make a difference in someone's life."

The most popular reason for wanting to teach was the desire to work with young people, with 59 first choice and 33 second choice selections. The second most popular selection was interest in the subject taught, with 28 first choice tabulations and 54 second place.

The method of response did not allow for statistical treatment of this variable in the same manner as the other independent variables. Table 9 presents the information in chart form.

### Descriptive Statistics

The descriptive statistics (means and standard deviations) for the independent variables of years of trade experience, years of teaching experience, postsecondary vocational hours, and other college hours are presented in Table 10. Those teachers in the sample averaged 20.69 college hours with the vocational prefix and 30.03 other college hours.

Table 9

Reasons for Teaching

Reasons for teaching	Choices			
	First	Second	Third	Zero
Desire to work with youth	59	33	9	13
Interest in subject	28	54	13	19
Valued by society	1	1	13	99
Job security	9	6	23	76
Long summer vacation	0	6	17	91
Pay is pretty good	0	3	11	100
Encouraged by former teacher	9	6	16	83
Other reasons	9	3	11	91

Note: The teachers were asked to rank their highest three reasons for wanting to teach as first, second, or third.

Table 10

Trade Experience, Teaching Experience and Hours of College  
Training, Descriptive Statistics

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	Mean	Standard Deviation
Years of Trade Experience	9.29	6.07
Years/Teaching Experience	15.03	8.09
College Hours/Voc. Prefix	20.69	19.47
Other College Hours	30.03	42.79

---

Note: n = 114

### Dependent Variables

The evaluation instrument contained 17 competencies for trade and industrial education. Each T&I teacher in the sample received a rating of from 1 to 4 on each competency. The Likert-type scale was delineated as: 1 (never), 2 (sometimes), 3 (usually), and 4 (always). Thus, a maximum of 68 points or a minimum of 17 points was possible for each teacher.

The instrument, when sent to the principals or assistant principals of the selected schools, had the competencies marked by letters, from A to Q. For statistical purposes, the competencies were numbered 1 to 17, correspondingly.

These competencies were subdivided into three sections or categories. The first section was **teacher preparation**: "The teacher prepares for instruction." Four competencies were included in this category, making a possibility of 16 points for a perfect evaluation on this section. The mean for **teacher preparation** section was 13.50, with a standard deviation of 2.13.

The second section was prefaced with the statement, "The teacher conducts instruction in ways to enhance student learning." Ten competencies were included in this section, for a maximum of 40 points as partial score on **delivery of**

**instruction.** The mean for this section was 35.42, with a standard deviation of 4.40.

The third section read, "The teacher supports organizations appropriate to the vocation," and contained the remaining three competencies, resulting in a score of 12 for maximum achievement for **support of youth and professional organizations.** For this section, the mean was 9.67, and the standard deviation was 1.98.

The scores on these variables tended to be high, with only 14, or 12.28%, below a total of 51 (average of 3, or usually). Six teachers (5.26%) were rated 4 on every competency, for a total of 68. The mean for the total scores received by the teachers in the form of evaluations by the immediate teacher supervisor was 58.59 with a standard deviation of 7.26. The frequencies for each competency, the means, and standard deviations are presented in Table 11. The results of the subsections are presented in Table 12.

Upon evaluation of the data, it was found that the lowest mean score (2.96) was for competency #3, "Includes written instructional procedures for accomplishing each objective in lesson plans." Only 31 teachers were rated as 4 (always) on this competency, while 32 teachers were rated as 2 (sometimes).

Table 11

Frequencies and Descriptive Statistics for Competencies and  
Total Scores of the Teacher Evaluations (n = 114)

Area	Number of Teachers Receiving each Rating				M	SD
	1	2	3	4		
<u>Teacher Preparation</u>						
#1 Task list	1	5	24	84	3.68	0.60
#2 Lesson plans	1	22	48	43	3.17	0.76
#3 Written procedures	2	32	49	31	2.96	0.79
#4 Organizes classroom	-	5	27	82	3.68	0.56
<u>Presentation of Instruction</u>						
#5 Relates new tasks to previous ones	-	4	38	72	3.60	0.56
#6 Criterion-based evaluation	2	9	49	54	3.36	0.71
#7 Variety of materials	-	10	40	64	3.47	0.65

(Table continued)

Table 11 (continued)

Area	Number of Teachers Receiving each Rating				M	SD
	1	2	3	4		
#8 Adjusts instruction	-	9	49	56	3.41	0.64
#9 Positive reinforcement	-	8	51	55	3.41	0.62
#10 High expectations	-	9	41	64	3.48	0.64
#11 Health and safety	-	6	21	87	3.71	0.56
#12 Current knowledge	-	3	23	88	3.75	0.49
#13 Classroom atmosphere	1	5	38	70	3.55	0.63
#14 Care of equipment	-	6	25	83	3.68	0.57
<u>Support of Organizations</u>						
#15 VICA	2	20	32	60	3.32	0.82
#16 Professional organizations	5	22	47	40	3.07	0.85
#17 Advisory committee	2	14	48	50	3.28	0.75
Grand Mean					3.44	0.43

Note: The ratings are 1 (never), 2 (sometimes), 3 (usually), and 4 (always).

Table 12

Means and Standard Deviations for the Competency Subsections

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Subsections	Mean	Standard Deviation
Teacher Preparation (Of 16 possible points)	13.50	2.13
Delivery of Instruction (Of 40 possible points)	35.42	4.40
Support of Organizations (Of 12 possible points)	9.67	1.98
Total (Of 68 possible points)	58.59	7.26

---



At the other extreme, competencies #11 and #12 had the highest mean score, with 3.71 and 3.75 respectively. Top ratings of 4 (always) were given to 87 and 88 teachers for these competencies. The eleventh competency relates to health and safety of students, and the twelfth relates to proficiency in the trade area.

Comparisons were made on these three competencies for those teachers in rural and urban areas and for the comprehensive high schools and vocational centers. These data are shown in Table 13.

When considering these extreme scores, very little difference was found in the means of ratings given to teachers in rural and urban schools and those of comprehensive high schools and vocational centers. The greatest difference in the means of these three competencies was between the means of the competency ratings obtained by teachers in rural and urban settings for competency #11, health and safety of students. The difference of 0.27 was statistically significant ( $t = 2.10$ ,  $df = 112$ ,  $p < .05$ ). No other competencies were studied in this manner.

#### Correlations among the variables

According to Ary, Jacobs, and Razavieh (1979), correlational studies are frequently used to determine the extent of a relationship that exists between variables.

Table 13

Frequencies and Descriptive Statistics for Designated  
Competencies, Showing Location and Type of School

	Number of Teachers Receiving each Rating				Mean	Standard Deviation
	1	2	3	4		
Competency #3					2.96	0.79
Rural	1	26	36	27	2.99	0.80
Urban	1	6	13	4	2.83	0.76
Comp.	1	6	17	9	2.97	0.83
Center	1	26	32	22	2.95	0.78
Competency #11					3.71	0.56
Rural	0	4	13	73	3.77	0.52
Urban	0	2	8	14	3.50	0.66
Comp.	0	2	5	27	3.74	0.57
Center	0	4	16	60	3.70	0.56
Competency #12					3.75	0.49
Rural	0	2	17	71	3.77	0.48
Urban	0	1	6	17	3.67	0.56
Comp.	0	1	6	27	3.76	0.50
Center	0	2	17	61	3.74	0.50

Correlation coefficients may vary between +1.00 and -1.00. As correlation coefficients approach zero, little or no relationship exists among the variables (Ary, et al., 1985).

The correlations between the dependent variable (total score on the competency list) and the independent variables are presented in Table 14. Very small correlation between the independent variables and the dependent variable was found in this study. There was no multicollinearity ( $r > .70$ ), and all the variables were retained for the analysis.

Correlation coefficients between the subsections of the dependent variables and the independent variables were also determined and are presented in Table 15. When analyzed in this fashion, some relationship was evident, although no practical predictive value was apparent.

A small positive correlation between years of teaching experience and vocational hours was significant ( $r = 0.33$ ,  $p < .01$ ). Significant negative correlations were found between other college hours and years of trade experience ( $r = -0.27$ ,  $p < .02$ ) and between vocational hours and the dependent variable of the total score for the competencies ( $r = -0.17$ ,  $p < .10$ ). Negative correlations were also found to exist for this study between the number of vocational hours and sections of preparation for instruction ( $r = -0.22$ ,  $p < .05$ ) and between the number of vocational hours

Table 14

Correlation between the Variables (n = 114)

	Trade Experience	Teaching Experience	Vocational Hours	Other Hours	Eval. Score
Trade	1.00	-0.01	-0.02	-0.27**	0.06
Teaching		1.00	0.33***	0.07	-0.03
Vocational Hours			1.00	0.05	-0.17*
Other Hours				1.00	0.05
Evaluation Score					1.00

\*Significant at the .10 level, two-tailed test.

\*\*Significant at the .02 level, two-tailed test.

\*\*\*Significant at the .01 level, two-tailed test.

Table 15

Correlation between Independent Variables and Three Sections


---

	Teacher Preparation	Delivery of Instruction	Support of Organizations
Trade Experience	0.01	0.09	-0.01
Years of Teaching	-0.09	0.02	-0.05
Vocational Hours	-0.21**	-0.10	-0.16*
Other College Hrs.	0.11	0.03	0.01

---

\*Significant at the .10 level, two-tailed test.

\*\*Significant at the .05 level, two-tailed test.

and support of professional organizations ( $r = -0.16$ ,  $p < 10$ ).

### Multiple Regression Analysis

Scatterplots were examined (See Appendix J) to gain more information about the relationships among the variables, particularly the extent to which the relationship was linear. Scatterplots can give additional information for determining both the direction and strength of a relationship between two variables. For this study, there seemed to be a very weak linear relationship.

To answer the research questions, multiple regression analysis was conducted using the stepwise technique. Table 16 presents the results of the regression analysis with all variables entered.

The b-value for each of the variables is given, denoting the regression coefficient for each of the four independent variables of years of trade experience (.09), years of teaching experience (.02), college hours with Vocational prefix (-.07), and other college hours (.01). The beta coefficients, or the standardized scores, are given for the independent variables: 0.08, 0.03, -0.18, and 0.08, respectively.

The standard error (SE) of  $\underline{b}$  is an estimate of the precision of regression coefficient, or b-value. The

Table 16

Results of Multiple Regression Analysis (n = 114)

Variable	b-value	Beta	SE	t-value	Simple R <sup>2</sup>
Trade Exp.	0.09	0.08	0.12	0.80	0.00
Teaching					
Exper.	0.02	0.03	0.09	0.26	0.00
Vocational					
Hours	-0.07	-0.18	0.04	-1.80	0.03
Other College					
Hours	0.02	0.08	0.02	0.83	0.00
(Constant)	58.31	-	1.94	30.04	-

Note: When Stepwise Multiple Regression Analysis was conducted none of the four independent variables was found to be at a level significant enough to be included further in the model.

t-value of -1.80 for the number of vocational college hours is significant at the .10 level ( $p < .10$ ). None of the other variables is significant at this level.

The chart indicates that, when rounded to two decimal places, the simple R-squared value obtained for years of trade experience, if only that variable was in the regression equation, was 0.00. The same is true for years of teaching experience and for number of college hours. The value of overall R-squared resulted in 3.79% of the variance explained.

#### Findings Related to the Research Questions

The two research questions centered around the independent variables of amount of trade experience, the amount of teaching experience, levels of professional training, both vocational courses and other college courses, and reasons for teaching and their relation to the scores received on the competency ratings as administered by the teacher's immediate supervisor at school. The following findings relate to these questions.

(1) What proportion of the variance in teacher competencies, when teachers are rated by their immediate vocational supervisor, is accounted for by each of the following variables?

Years of trade experience. No significant relationship of trade experience to rated teacher competency was found.



The correlation coefficient for the relationship between rated teacher competency and years of trade experience was found to be 0.06 for this study, and the coefficient of determination was 0.0032. This proportion was not at a level of significance to have predictive value for this study.

Years of teaching experience. According to the findings of this study, years of teaching experience have little or no relationship to the rated competencies of T&I teachers in the classroom. The relationship between years of teaching experience and the competency ratings showed a negative correlation coefficient ( $r = -0.03$ ) and was not significant. The coefficient of determination for years of teaching was  $r^2 = 0.0008$ .

Level of vocational teacher training. The hours of professional training with Vocational prefix, as reported by the T&I teachers involved in this study, may have a slight negative correlation with teacher competencies as assessed by the teachers' immediate supervisor ( $r = -0.17, p < .05$ ). This variable yielded a coefficient of determination of  $r^2 = 0.0279$  showing that about 3% of the variance in the total rating scores can be associated with hours of vocational college training.

Other professional hours. The effect of other college hours when considered in relation to the total evaluation scores was negligible ( $r = 0.05$ ,  $p < .05$ , and  $r^2 = 0.0025$ ).

Reasons for teaching. Ninety-two teachers selected a desire to work with young people as either their first or second choice for entering the teaching profession. Nearly as many (82) selected as their first or second choice an interest in the subject matter. Job security was selected most as a third choice (23), with 15 people also choosing this reason as first or second choice. A former teacher influenced 15 people to choose the teaching profession, either as first or second selection, with 16 rating this reason as third. The researcher was unable to correlate these variables with the other independent variables because of the manner of response which was requested from the teachers.

(2) When examined in combination, what personal and professional variables will best predict competence of trade and industrial education teachers?

Using stepwise multiple regression, competence in teaching as assessed by the 114 teachers' supervisors on the 17 competencies can be partially accounted for by combining the years of trade experience, years of teaching experience, hours of professional vocational training, and other college hours. The proportion of this competence is approximately

4%, with 3% associated with the number of college hours with a Vocational prefix.

The results of the multiple regression analysis presented in Table 16 provided the following prediction equation for success of T&I teachers in Virginia:

$$Y' = 58.31 + 0.09x_1 + 0.02x_2 - 0.07x_3 + 0.01x_4$$

where  $x_1$  = years of trade experience

$x_2$  = years of teaching experience

$x_3$  = vocational hours of professional training and

$x_4$  = other hours of professional training.

When the data were analyzed in a stepwise multiple regression, none of the four independent variables was significant.

### Summary

This chapter presented the description of the sample and the results of correlational and regression analyses to answer the research questions. The sample ( $n = 114$ ) from the T&I teachers in Virginia was described according to the independent variables of years of trade experience, years of teaching experience, hours of professional training with Vocational prefix, and other postsecondary hours of training, and reasons for entering the teaching profession.

The first research question asked: What proportion of the variance in teacher competencies, as rated by vocational administrators, is accounted for by each of the included

variables? Correlation coefficients indicated that years of trade experience, years of teaching experience, and other postsecondary hours of training had no significant effect upon the competence of T&I teachers when evaluated by their immediate supervisors. Negative correlation was indicated between hours of vocational training and total scores on the competencies.

The second research question asked: When examined in combination, what personal and professional variables are the best predictors of competence of trade and industrial education teachers? Multiple regression analysis indicated that the four independent variables explained only 3.97% of the total variance of teacher competence as measured by the teachers' immediate supervisors. There was no "best" predictor indicated by this study.

The mean ratings on the 17 competencies for the teachers in the sample were all above 3 (usually) except for one competency, and each showed little variation. The two competencies with the highest average were related to safety and knowledge of the subject matter. The competency with the lowest average related to written instructional procedures for lesson plans. There was no significant difference for teachers in comprehensive high schools and vocational centers in their classroom performance. The

study indicated no difference in rural and urban teachers as to their performance.

## Chapter 5

### Summary, Conclusions, and Recommendations

The purpose of this study was to investigate the relationship between the independent variables of years of trade experience, years of teaching experience, hours of professional education, and reasons for wanting to teach and the dependent variables of the total scores obtained on 17 competencies and three subsections by the selected T&I teachers. If relationships were found, administrators charged with the responsibility of hiring new personnel would have more information to help determine qualities of successful teachers in the T&I field. In addition, improved coursework and inservice programs could result if such a relationship exists.

### Summary of the Study

Problem The following questions were investigated and answers provided:

(1) What proportion of the variance in teacher competencies, as rated by the immediate T&I administrator, is accounted for by each of the following variables?

Years of trade experience

Years of teaching experience

Levels of professional training

Teacher training (Vocational prefix)

Other college hours

(2) Which of the aforementioned variables are the best predictors of high ratings of teacher competence in the T&I education program?

This study utilized the survey method to ascertain the answers to these questions. To evaluate the performance of selected teachers in various schools in Virginia, teachers were rated by their immediate supervisors using the list of T&I competencies developed by the researcher. One hundred thirty (130) teachers from 74 comprehensive high schools and vocational centers across the state of Virginia were randomly selected to participate in this study.

The study was limited to full-time T&I teachers in the public comprehensive secondary schools and secondary vocational centers in Virginia. Teachers of health occupations, full-time teachers of the disadvantaged and handicapped students in T&I programs, teachers of related subjects, and teachers of prevocational programs were eliminated from the selection process.

The rating instrument was developed with the assistance of a panel of experts who have had numerous years of experience in the field of T&I education. Reliability of the instrument was estimated by conducting a pilot study involving 27 T&I teachers in Virginia. Reliability, using Cronbach's Coefficient Alpha, was estimated to be at 0.84. The instrument, when finalized, consisted of 17 competencies

on which each teacher was rated by his/her immediate supervisor (principal or assistant principal).

Teachers were also asked to complete a questionnaire to collect the number of years of trade experience when hired, the number of years of teaching experience, amount of professional training, and reasons for entering the teaching profession. Packets containing evaluation instruments and questionnaires were mailed to the principals of each of the participating schools during the month of September, 1992. Eighty-seven percent (87%) of the mail surveys were returned (n = 114). Data were analyzed by the NCSS computer program.

### Conclusions

The interpretation of the findings of the aforementioned questions, as studied by the researcher, indicates that no substantive conclusions can be drawn from this study. The findings of this research indicate that nothing can be gained by partialing out the variance among the independent variables. None of the variables which were selected was a significant predictor of teacher competence as rated by the teachers' immediate supervisor. Teachers' competence, as rated by their immediate supervisor was not predictable by the variables included in this study.



### Trade experience

There was no significant correlation between the number of years of trade experience and the competency ratings of the teacher as given by the administrator ( $r = 0.06$ ).

When examining the categories of teacher preparation, delivery of instruction, and support of professional organizations, the correlations with years of trade experience were found to be near zero. Therefore, increased years of trade experience did not increase the competency scores of teachers as rated on the instrument when evaluated by the teachers' immediate supervisor.

This lack of relationship between trade experience and competency in teaching disagrees with the findings of Swartz (1974), who found a significant relationship between years of trade experience and competency ratings by the administrator. He found no significant differences in the ratings by the administrator, supervisor, teacher-peers, teachers on self-ratings, and student ratings, by combining trade experience, teaching experience, and professional education.

The findings in this study indicate that those teachers with little or no trade experience were rated just as well as those with higher levels of trade experience. There was very low correlation between years of trade experience and the ratings given by the supervisors ( $r = 0.06$ ). This

supports the study conducted by Welch and Garner (1976) who found that the amount of teacher work experience did not necessarily result in higher student achievement. This study also does not specifically address the amount of work experience required for certification of T&I teachers.

#### Teaching experience

There was no significant correlation between the years of teaching experience and the competency ratings of the teachers ( $r = -0.03$ ). Nearly three-fourths (73.7%) of the teachers who were surveyed had 20 years or less in teaching, as shown in Table 6.

The findings of this study agree with the findings of Swartz (1974), as he compared the ratings of vocational industrial teachers with low teaching experience and those with high teaching experience. No significant differences were found in his study.

The positive correlation ( $r = 0.33$ ,  $p < .01$ , Table 14) between the years of teaching experience and vocational hours indicated that T&I teachers who stay in the profession take additional hours of training in vocational college courses. However, this positive correlation was not found between years of teaching experience and other college hours, as the correlation for these two areas was 0.06, and was not significant at the .05 level.

### Professional training

For this study, hours of professional training were divided between those hours of postsecondary training related to vocational techniques (Vocational prefix) and other hours of college training. The two categories of professional training were summarized in Tables 7 and 8.

As shown in Table 7, nearly one-third (31.5%) of the teachers surveyed had ten hours or less of vocational hours. Nearly two-fifths (37.7%) had between 11 and 20 hours of vocational college hours. It would be expected that T&I teachers would have approximately 10 to 12 hours of vocational classes, as these are offered by the teacher preparation colleges in most of the locations across the state of Virginia. These basic courses deal with shop management, curriculum for the various trades, and other topics appropriate for beginning T&I teachers.

There was a small negative correlation ( $r = -0.17$ ,  $p < .10$ ) between vocational hours and competency ratings given by the teachers' immediate supervisor. Vocational hours also correlated negatively with the subsection of preparation for instruction ( $r = -0.21$ ,  $p < .05$ ) and with support of professional organizations ( $r = -0.16$ ,  $p < .10$ ).

Table 8 shows that more than one-third (34.2%) of the T&I teachers surveyed had no college hours other than

vocational hours. Other college hours, as illustrated in Table 14, was not significantly correlated with the dependent variable of total ratings for the teacher. However, this variable showed a negative correlation ( $r = -0.27$ ,  $p < .05$ ) with years of trade experience.

To the researcher, this relationship would indicate that those teachers who have been involved with industry, gaining trade experience, have had less time to pursue a formal education beyond the training years in a trade. The basic instructional classes (up to 12 hours of vocational courses) as recommended by the T&I division of the Virginia Department of Education for endorsement for beginning teachers provide preparatory instruction for these T&I teachers.

The subsections of preparation for teaching, delivery of instruction and organizations were correlated with other college hours, as illustrated in Table 15. None of the subsections had a significant correlation with this variable. Therefore, it was found that for this study "other college hours" had no effect upon the total scores given to the selected teachers on the evaluation instrument. Other hours also had no significant relationship upon the ratings given in the subsections of the competency list. These results support the findings of the Swartz (1974) study related to teacher preparation.

### Reasons for teaching

The teachers were asked to mark their first, second, and third choices for their reasons for entering the teaching profession from a list of seven reasons, with "other" as an eighth choice. Eighty-seven teachers, or 76%, selected as first choice either "a desire to work with young people" or "interest in their subject matter," as shown in Table 9.

The selection, "valued by society," had only 15 teachers who felt this important enough to mark as one of the selections. Only 14 people marked "the pay is pretty good" as one of their choices.

The findings of this study are similar to those of the National Education Association (1982) in which teachers selected "a desire to work with young people" and "interest in a subject matter" as priority reasons for entering the teaching profession. Bradley and Friedenbergl (1987) also described expectations of beginning T&I teachers as related to these two areas. In addition, the Harris and Wittkamper (1986) study found that teachers selected needs which were more idealistic than practical, as was found in this study.

This study, then, is in agreement with the research related to reasons for teaching. The more idealistic reasons were rated higher than practical reasons of "pay is pretty good" and "long summer vacation."

### Discussion

The results of this study indicate that the ratings of teachers on selected competencies as rated by the administrators are not dependent on the variables of years of trade experience, years of teaching experience, or hours of postsecondary professional training. Various reasons may be given for the outcome of this research project.

1. The instrument was not sensitive enough to reflect variances on the included competencies. The researcher attempted to develop an instrument with which the teachers' supervisor would be able to fairly evaluate the performance of each teacher involved. The advice of a panel of experts was solicited to examine the competencies. They agreed that the competencies were appropriate for inclusion in the study. However, these 17 competencies may be inefficient in explaining the variance.

The pilot study, with 27 teachers across the state of Virginia, provided estimated reliability for the instrument as developed. The Cronbach Coefficient Alpha of .84 indicated that the total instrument and the competencies were reliable and consistent for the selected sample of T&I teachers.

The data collection sheet may not have been thorough or stated clearly enough to discriminate among the independent variables. It was evident to the researcher that the

reasons for teaching could have been treated in a different manner had the teachers received different instructions for marking them. The inclusion of all the choices in the available data, rather than marking "zero" for those not selected, would have allowed more thorough investigation.

2. The computer list of numbers included only competent teachers. This reason, statistically, is not valid, unless there are only well-trained, competent T&I teachers in Virginia. The sample included teachers in rural and urban areas and from both comprehensive high schools and vocational centers. From experience as principal of a vocational center and from conversations with administrators across the state, the researcher feels that the probability of having all competent teachers is highly unlikely.

3. The supervisors of the selected teachers were biased in the ratings given to the teachers. This explanation is plausible. Perhaps the supervisors were pressed for time and did not study the competency list thoroughly. Perhaps they wanted to make the program at their school appear superior. Perhaps they did not understand the impact which the study could have on the future of training for T&I education. Perhaps some of the supervisors were not knowledgeable enough about the T&I program in their schools to effectively evaluate the teachers and their performance in the T&I area.

By visual examination of the data sheets, when more than one teacher from a site was selected, it appeared to the researcher that some of the supervisors did rate one teacher higher than another, thereby discriminating among the two or three choices. However, it also appeared that some of the supervisors did not make any distinction.

4. Perhaps because of the T&I administrators' performance in selecting potential teachers, most teachers will rate almost equally well on the competencies selected for this study. In times of high unemployment, as in some areas of Virginia at this particular time, the pool of potential T&I teachers is increased. The incompetent teachers, if on the staff, will perhaps strive to perform at a higher level of competency, realizing that others will be more readily available to replace them if performance is low, especially if the teacher is untenured.

In addition, most T&I programs have inservice training to meet the needs both of beginning teachers and presently employed teachers. Colleges with teacher training programs offer courses specific for the beginning T&I teachers. Advisory committees, business partnerships, summer institutes, and on-going inservice programs for those who are presently employed help keep the T&I teacher up-to-date on the current trends and techniques in each skill area. The "survival skills" training for beginning teachers just



out of industry and periodic upgrading for experienced teachers may account for the high ratings given to most of the teachers in the sample.

From personal experiences, there are T&I teachers who have bachelor degrees who have been observed to be very competent in their field, as well as those with a BS degree who would never prove capable of imparting knowledge to students. Likewise, there are teachers who have little training in teaching techniques who are quite capable of managing a classroom or laboratory with great skill. So what makes a "good" teacher?

According to Weaver (1993) dynamic teaching involves a personal commitment. A teacher must like students, believe in the information that he/she has, and be willing to share it. Teachers must also have positive attitudes, demonstrate enthusiasm, and use examples and illustrations in their teaching techniques. Weaver further states that greatness in teaching cannot be taught but comes from natural talents. This may be true of the T&I teachers in Virginia.

### Recommendations

The following recommendations are stated, based on the findings of this study:

1. Based upon the findings of this study, there is no clear indication for recommendations to change the procedures for hiring and training new personnel, as it is

now practiced in the state of Virginia. Neither are there indications for recommendations for the procedures to stay the same.

2. This study, with changes, could be conducted in states other than Virginia to determine if the findings are applicable in other situations.

3. If time and resources would allow it, the future researcher should visit each site personally, or train two or three assistants to perform the ratings, thereby eliminating the potential for the "halo" effect, for bias, or lack of knowledge of the supervisors.

The researcher believes that the concept of having trade experience as a prerequisite for employment in the T&I teaching field is historically important to the field of education. This study showed no evidence of increased competency ratings in the areas studied, related either to teachers with or without trade experience, or to levels of teachers' collegiate training. However, the researcher believes that some characteristic could be found to predict teaching competence, providing an appropriate instrument for assessment could be developed.

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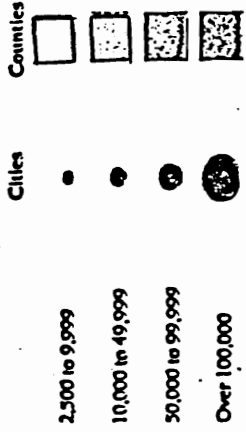
**APPENDICES**

APPENDIX A

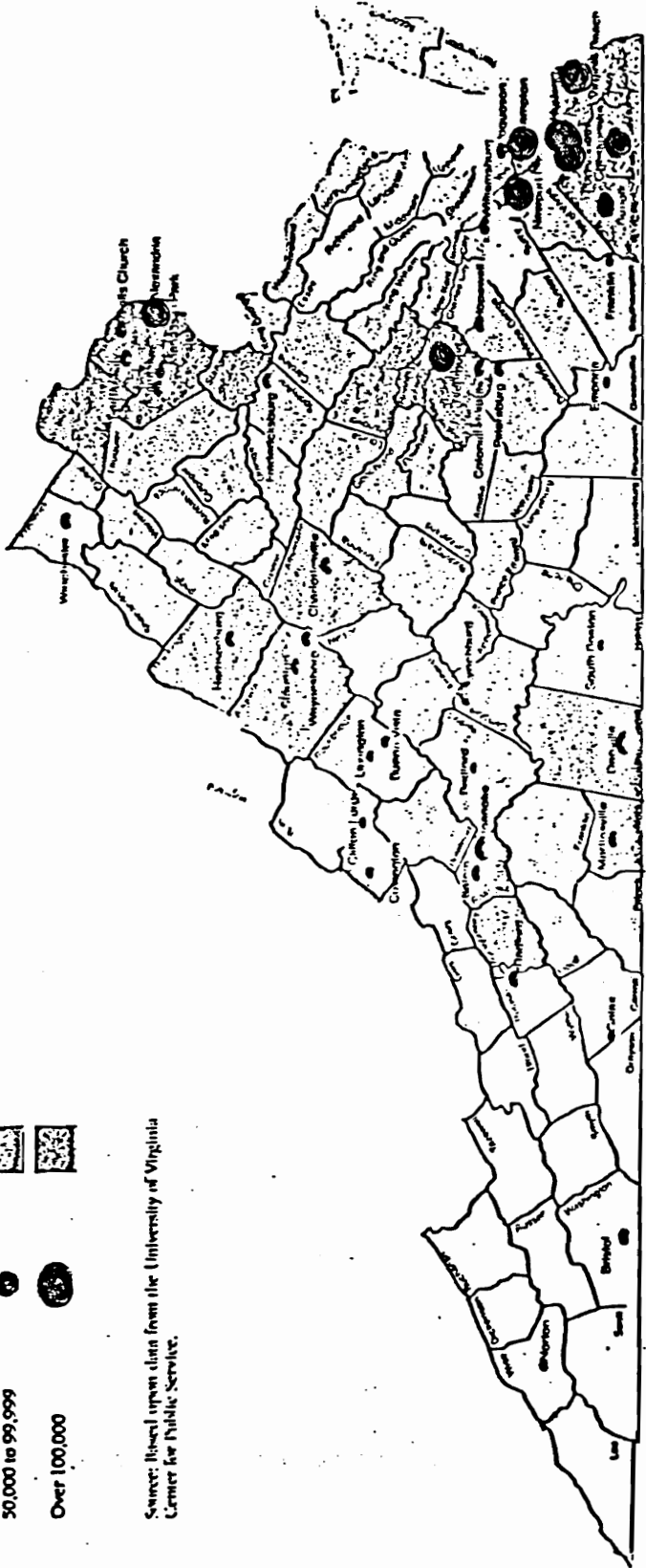
MAP INDICATING RURAL OR URBAN AREAS OF VIRGINIA

POPULATION

VIRGINIA URBAN-RURAL POPULATION



Source: Based upon data from the University of Virginia Center for Public Service.



APPENDIX B  
PANEL OF EXPERTS  
WITH COVER LETTER



Panel of Experts

**Teacher trainer**

Dr. Lester G. Duenk  
Professor of Vocational Education  
Virginia Polytechnic Institute and State University  
Blacksburg, Virginia

**Vocational research professor**

Dr. Marion Asche  
Professor, VPI&SU  
Blacksburg, Virginia

**Assistant state supervisor, T&I education, retired**

Mr. Jacob H. Lowe  
Abingdon, Virginia

**T&I teachers**

Mr. Jerry Lockhart  
Buchanan County Vocational School  
Rt. 5, Box 110  
Grundy, Virginia 24614

Mr. Roger Caudill  
Pulaski County High School  
Pulaski, Virginia

Mr. Bobby Ferguson  
Russell County Vocational School  
Lebanon, Virginia

**Vocational directors**

Mr. Don Raines  
Director, Vocational and Adult Education  
Dickenson County Schools  
Clintwood, Virginia

Mr. Carl Jackson  
Director, Vocational and Adult Education  
Russell County Schools  
Lebanon, Virginia

Mr. Charlie Frye  
Director, Vocational and Adult Education  
Tazewell County Schools  
Tazewell, Virginia

**Vocational center principals**

Mr. Robert Rife, Principal  
Buchanan County Vocational School  
Grundy, Virginia

Mrs. Norma Keesee, Principal  
Neff Center  
Washington County  
Abingdon, Virginia

Mr. Robert Raines, Principal  
Wise County Vocational Center  
Wise, Virginia

Rt. 1, Box 30  
Pilgrims Knob, VA 24634  
April 2, 1992

Member, Panel of Experts  
Director of Vocational Education  
Virginia County Schools  
Virginia City, VA

Dear ----,

As we discussed today on the phone, as part of my doctoral dissertation leading to the degree of Doctor of Education in Vocational Education at Virginia Polytechnic Institute and State University (VPI&SU), I am conducting a research study. Thank you for agreeing to take a few minutes of your time to serve as a member of a panel of experts in vocational education to review a list of trade and industrial (T&I) teacher competencies.

Please examine the enclosed list of T&I teacher competencies and check "Yes" or "No" as to the appropriateness of each competency as a quality needed by successful T&I teachers. Feel free to make suggestions about each item and add comments if you desire.

The completed form should be returned in the enclosed stamped, self-addressed envelope as soon as possible.

Again, thank you for taking time from your busy schedule and assisting me in this worthwhile project.

Sincerely,

Arthur W. Mullins  
Phone: (703) 259-7431

copy: Dr. Lester Duenk, VPI&SU

APPENDIX C  
COMPETENCIES FOR  
TEACHERS OF  
TRADE AND INDUSTRIAL EDUCATION  
AS REVIEWED BY PANEL OF EXPERTS

Please mark each task as being an appropriate competency for an effective teacher of trade and industrial education. Feel free to make comments for each task listed, as well as at the end of the list. Thank you.

COMPETENCIES FOR  
TRADE AND INDUSTRIAL EDUCATION

I. Prepares for instruction

- A. Has a task list for each student which includes all curriculum competencies.

\_\_\_\_\_Yes      \_\_\_\_\_No      Comments\_\_\_\_\_

---

- B. Prepares written lesson plans to include objectives keyed to competencies for trade and industrial education.

\_\_\_\_\_Yes      \_\_\_\_\_No      Comments\_\_\_\_\_

---

- C. Includes written instructional procedures for accomplishing each objective in lesson plans.

\_\_\_\_\_Yes      \_\_\_\_\_No      Comments\_\_\_\_\_

---

- D. Organizes classroom or lab, equipment, and tools in a manner suitable for instruction.

\_\_\_\_\_Yes      \_\_\_\_\_No      Comments\_\_\_\_\_

---

II. Conducts instruction in ways to enhance student learning.

- E. Focuses attention of students on competency to be taught, relating new task to previous ones.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

- F. Uses a criterion-based evaluation procedure which tests student performance on each objective.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

- G. Uses a variety of techniques and materials to present lesson content.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

- H. Adjusts instruction as needed during the lesson to facilitate learning at all student levels.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

- I. Motivates students with positive reinforcement, e.g. shows enthusiasm, maintains eye contact, uses gestures and movements.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

- J. Holds high expectations of students for completion of required competencies within the framework of time given, reteaching competency if not at an acceptable performance level.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

- K. Facilitates the development of health and safety consciousness by accounting for all students and teaching them to keep the work area free from safety hazards, to properly evacuate the building, and to properly use all equipment and hazardous materials.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

- L. Maintains current knowledge and skill of subject matter, showing proficiency in the use of tools and equipment.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

- M. Maintains control of the classroom environment, treats students fairly, providing for a situation where there is mutual respect between students and teacher.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

III. Support of organizations

N. Maintains an active interest in Vocational Industrial Clubs of America, directing classroom and community activities around the aims and objectives of this organization.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

O. Supports and participates in professional education organizations which are dedicated to the advancement of vocational education.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

P. Maintains contact with an advisory committee to revise and upgrade skills to be taught and to provide current information to the students.

\_\_\_\_ Yes      \_\_\_\_ No      Comments \_\_\_\_\_

---

Additional comments: \_\_\_\_\_

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APPENDIX D  
RATING INSTRUMENT

**COMPETENCIES FOR  
TRADE AND INDUSTRIAL EDUCATION**

**I. The teacher prepares for instruction**

Never	Sometimes	Usually	Always	
1	2	3	4	
				A. Has a competency list for each student which includes tasks for each competency.
				B. Prepares written lesson plans which include objectives keyed to competencies for instructor's trade area.
				C. Includes written instructional procedures for accomplishing each objective in lesson plans.
				D. Organizes classroom or laboratory, equipment, and tools in a manner suitable for instruction.

**II. The teacher conducts instruction in ways to enhance student learning.**

Never	Sometimes	Usually	Always	
1	2	3	4	
				E. Focuses attention of students on competency to be learned, relating new tasks to previous ones.
				F. Uses a criterion-based evaluation procedure which tests student performance on each objective.

Never	Sometimes	Usually	Always		
1	2	3	4		
				G.	Uses a variety of techniques and materials to present lesson content. This variety could include, but is not limited to, large and small group instruction, guided and independent activities, manipulatives.
1	2	3	4	H.	Adjusts instruction as needed during the lesson to facilitate learning, considering different student levels and learning styles.
1	2	3	4	I.	Motivates students with positive reinforcement, e.g. shows enthusiasm, maintains eye contact, uses gestures and movements.
1	2	3	4	J.	Holds high expectations of students for completion of required competencies within the framework of time given, reteaching competency if not at an acceptable performance level.
1	2	3	4	K.	Facilitates the development of health and safety consciousness by accounting for all students and teaching them to keep the work area free from safety hazards, to properly evacuate the building, and to properly use all equipment and hazardous and nonhazardous materials.
1	2	3	4	L.	Maintains current knowledge of and skill in trade area, showing proficiency in the use of tools and equipment.
1	2	3	4	M.	Maintains control of the classroom environment, treats students fairly, provides for an atmosphere where there is mutual respect between students and teacher.

1 Never  
 2 Sometimes  
 3 Usually  
 4 Always

N. Provides instruction for the proper care and accounting of tools, materials, and equipment.

III. The teacher supports organizations appropriate to the vocation.

Never  
 1  
 Sometimes  
 2  
 Usually  
 3  
 Always  
 4

O. Maintains an active interest in Vocational Industrial Clubs of America, directing classroom and community activities around the aims and objectives of this organization.

1 2 3 4

P. Supports and participates in professional education organizations which are dedicated to the advancement of vocational education.

1 2 3 4

Q. Maintains contact with an advisory committee to revise and upgrade skills to be taught, to provide current information to the students, and to help secure supplies.

APPENDIX E  
QUESTIONNAIRE FOR  
TEACHER INFORMATION

QUESTIONNAIRE  
SURVEY PARTICIPANT  
TRADE AND INDUSTRIAL TEACHER

Please respond to the following questions concerning your years of trade and teaching experiences, your professional training, and your reason for wanting to teach. Thank you for your time and effort in this study.

1. The number of years trade experience for which you received credit when your Virginia teaching certificate was first issued. \_\_\_\_\_

2. The number of years of teaching experience, including all experience for which you receive credit on your present pay scale \_\_\_\_\_

3. The number of hours of postsecondary college training  
 \_\_\_\_\_ Voc. prefix (methodology and teacher education)  
 \_\_\_\_\_ Other college hours

4. Please select and rank three reasons for wanting to teach.  
 Number 1 is the greatest influence on your professional choice.

\_\_\_\_\_ A desire to work with young people

\_\_\_\_\_ Interest in my subject matter

\_\_\_\_\_ The value which society places on teaching

\_\_\_\_\_ Job security

\_\_\_\_\_ Long summer vacation

\_\_\_\_\_ The pay is pretty good

\_\_\_\_\_ A previous teacher encouraged me to teach

\_\_\_\_\_ Other \_\_\_\_\_

Thank you for your assistance. Your answers will remain anonymous.

APPENDIX F  
LETTER TO SUPERINTENDENTS  
PERMISSION TO CONDUCT STUDY

Rt. 1, Box 30  
Pilgrims Knob, VA 24634  
April 21, 1992

Superintendent  
Designated School System  
Designated Location

Dear Sir or Madame:

I am conducting a research study as part of my doctoral dissertation at Virginia Polytechnic Institute and State University. The research topic is "The Relationship between Desirable Teacher Qualities and Teacher Training, Trade Experience, and Years of Teaching Experience of Trade and Industrial Teachers in Virginia."

I would like permission to involve A NUMBER OF teachers in your school division. The teachers' names will not be used in the study, and all information will be used in strict confidence. A questionnaire will be sent to the principal of schools selected, and the information will be returned to me.

The results of this study will be available to you in order for you to use the results in selecting new T&I teachers and in assisting the present teachers to improve skills.

If you wish to **NOT** give permission for this study to be conducted in your division, please inform me by April 28. Otherwise, a reply will not be necessary.

Thank you for taking the time to consider this study.

Sincerely,

Arthur W. Mullins  
Phone (703) 259-7431

cc: Dr. Lester Duenk, VPI & SU



APPENDIX G  
COVER LETTER FOR PILOT STUDY

Rt. 1, Box 30  
Pilgrims Knob, VA 24634  
May 1, 1992

Principal  
School Name  
School Address

Dear Colleague:

As part of my doctoral dissertation in Vocational Education at Virginia Tech, I am conducting a study involving competencies of a successful trade and industrial teacher as the traits relate to years of trade experience, years of teaching experience, hours of professional training, and reason for wanting to teach. Your superintendent has been informed of this study and of the number of participants from your school.

Presently, I am involved only with the pilot study to determine the reliability of the rating instrument. This step involves 30 teachers from across the state who will be rated by their immediate supervisor (principal) in T&I education. Teacher identification for the purpose of this study will only be by number and trade area. Schools will be classified as being rural or urban (by VICA districts) and as comprehensive high schools or vocational centers.

By random selection, teachers from (1 to 3) shops in your school have been chosen by computer to participate in the pilot study. They are:

NAME OF SHOP(S)

Of course I would want these teachers to know that they have been selected. In the event that these teachers would not wish to be participants, please select the next trade area as listed for your school (center) in the Virginia Directory for Trade and Industrial Education. Note this action on the instrument by crossing out the number in the upper right corner of the list of competencies, adding one to this number, and writing the new number underneath the old one.

Please take time to review the rating instrument and circle the number which you feel best describes each teacher's

Pilot 2

performance on each of the competencies listed. The pilot instrument should then be returned to me in the enclosed stamped, self-addressed envelope.

I would like to stress that your objectivity on rating each teacher will make the study more reliable. The final results from this study will be made available to T&I teacher training institutes, the Virginia State Department of Education, the Virginia Vocational Association, and interested individuals. It is expected that improved selection, inservice, and training of T&I teachers will result from this study.

Please use the enclosed coins to buy a soft drink or coffee for your enjoyment as you complete the forms.

Thank you very much for your assistance.

Sincerely,

Arthur W. Mullins  
Phone (703) 259-7431

Copy: Dr. Lester G. Duenk, VPI&SU

Enclosures

APPENDIX H  
LETTERS TO PRINCIPALS  
AND TEACHERS

Rt. 1, Box 30  
 Pilgrims Knob, VA 24634  
 September 21, 1992

Principal  
 School Name  
 School Address

Dear Fellow Educator,

As part of a doctoral study at Virginia Polytechnic Institute and State University, I am conducting a survey on the qualities of an effective T&I teacher as they relate to years of teaching experience, years of trade experience, professional training beyond high school, and reasons for wanting to teach. Your superintendent has been informed of this study and of the number of participants from your school, and now I sincerely solicit assistance from you or a member of your administrative staff.

Your part in the study is vital, yet simple. (A number) teachers from your school have been randomly selected (using the Virginia Directory for Trade and Industrial Education, 1991) to be rated by their immediate supervisor (principal) in T&I education. The same teachers will be asked to complete a simple questionnaire to collect the demographic information as listed above. The teachers represent these shops:

TEACHER NUMBER(S)	NAME(S) OF SHOP(S)
-------------------	--------------------

Teacher identification for the purpose of this study will only be by number and trade area. Schools will be classified as being rural or urban (by VICA districts) and as comprehensive high schools or vocational centers.

In the event that any teacher would not wish to be a participant, please select an alternate teacher. It is necessary, however, that the rating instrument and survey form be for the same teacher.

Please take time to review the rating instrument and circle the number which you feel best describes each teacher's performance on each of the competencies listed. The instrument, along with the questionnaire, should then be

## Instrument 2

returned to me in the enclosed stamped, self-addressed envelope.

I would like to stress that your objectivity on rating each teacher will make the study more reliable. The final results from this study will be made available to T&I teacher training institutes, the Virginia State Department of Education, the Virginia Vocational Association, and interested individuals. It is expected that improved selection, inservice, and training of T&I teachers will result from this study.

Having recently retired as principal of a vocational center after 22 years, I understand the hectic times ahead. Please use the enclosed coins to buy a soft drink or coffee for your enjoyment as you complete the forms.

Thank you very much for your assistance.

Sincerely,

Arthur W. Mullins  
Phone (703) 259-7431

Enclosures

LETTER TO TEACHERS

Rt. 1, Box 30  
Pilgrims Knob, VA 24634  
September 21, 1992

Dear Fellow T&I Educator,

As part of my doctoral study at Virginia Polytechnic Institute and State University, I am conducting a survey on the qualities of an effective T&I teacher as they relate to years of teaching experience, years of trade experience, professional training beyond high school, and reasons for wanting to teach.

Your name was selected by computer from the list of all T&I teachers in Virginia which are included in the study. Your principal/supervisor has agreed to rate your competencies as a teacher of T&I education. I would like for you to complete the enclosed questionnaire at your earliest convenience and return it to your principal so it may be returned to me as soon as possible.

Please be aware that in no way will your answers nor the ratings given by your principal jeopardize your teaching position, nor will the confidentiality of either response be abridged. The only identification included on either form is the number, which is to insure correspondence between the two forms.

Please use the enclosed coins to buy a soft drink or coffee while you complete the questionnaire. Thank you very much for your assistance.

Sincerely,

Arthur W. Mullins  
Phone: (703) 259-7431

APPENDIX I  
FOLLOW-UP LETTER TO PRINCIPALS



Rt. 1, Box 30  
Pilgrims Knob, VA 24634  
October 16, 1992

Principal  
School Name  
School Address

Dear Fellow Educator,

I need your help! Approximately three weeks ago I mailed a packet of material to you at the above school address. As of this date I have not received a response from you. Your assistance in completing these forms is very important to me and to the interest of trade and industrial education in Virginia.

This survey is part of my doctoral study at Virginia Polytechnic Institute and State University. My study involves the qualities of an effective T&I teacher as these qualities relate to years of teaching experience, years of trade experience, professional training beyond high school, and reasons for wanting to teach.

Please take the time to review the packet and have the selected teacher(s) to complete the appropriate form. Again I wish to stress to you and to the selected personnel that the strictest precautions will be taken to guarantee confidentiality and to treat the data as group data, rather than as individual schools and teachers.

Should the packet of materials have been lost in the mail or in the shuffle of opening of school, I will be glad to mail another if you will let me know.

Continued success to you and your staff. May this school year be the most productive ever.

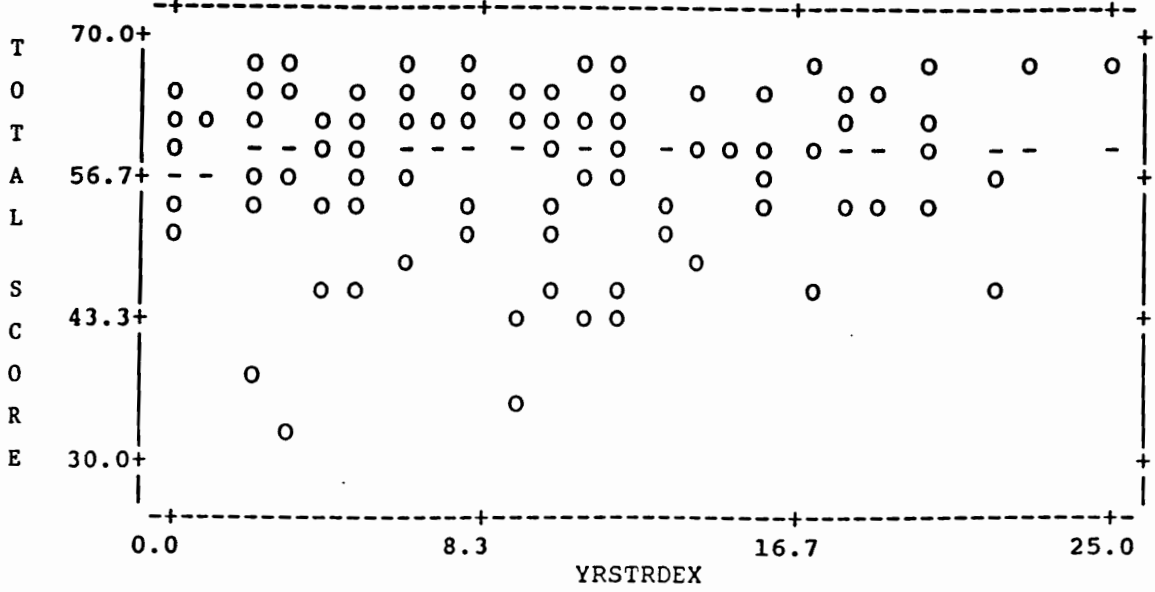
Sincerely,

Arthur W. Mullins  
Phone: (703) 259-7431

APPENDIX I  
SCATTERPLOTS

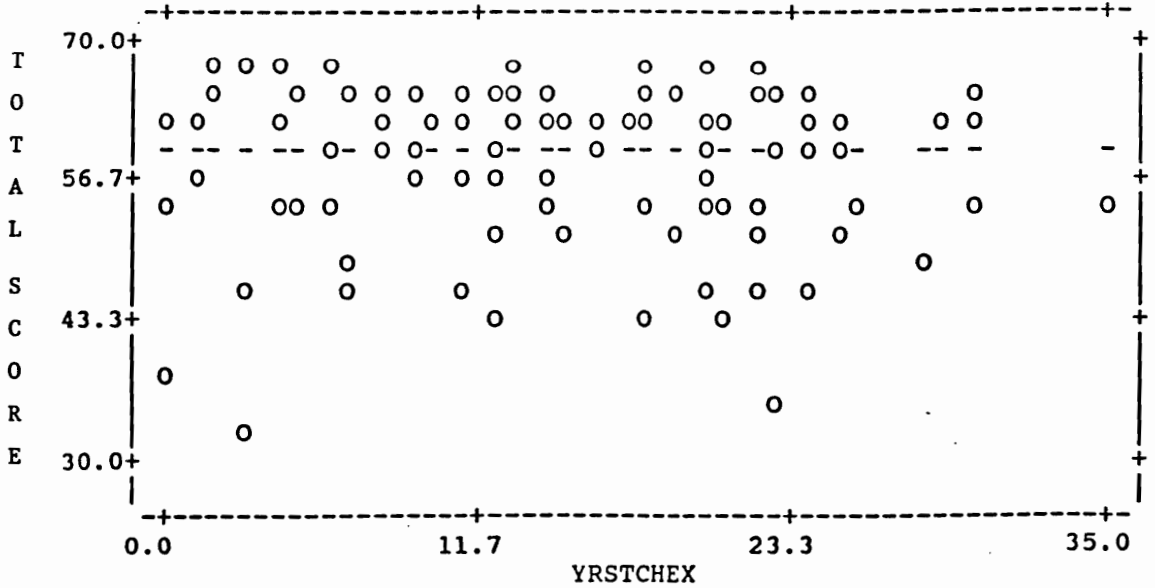
Scatter Plots

X (YRSTRDEX) by Y (TOTAL) = 0

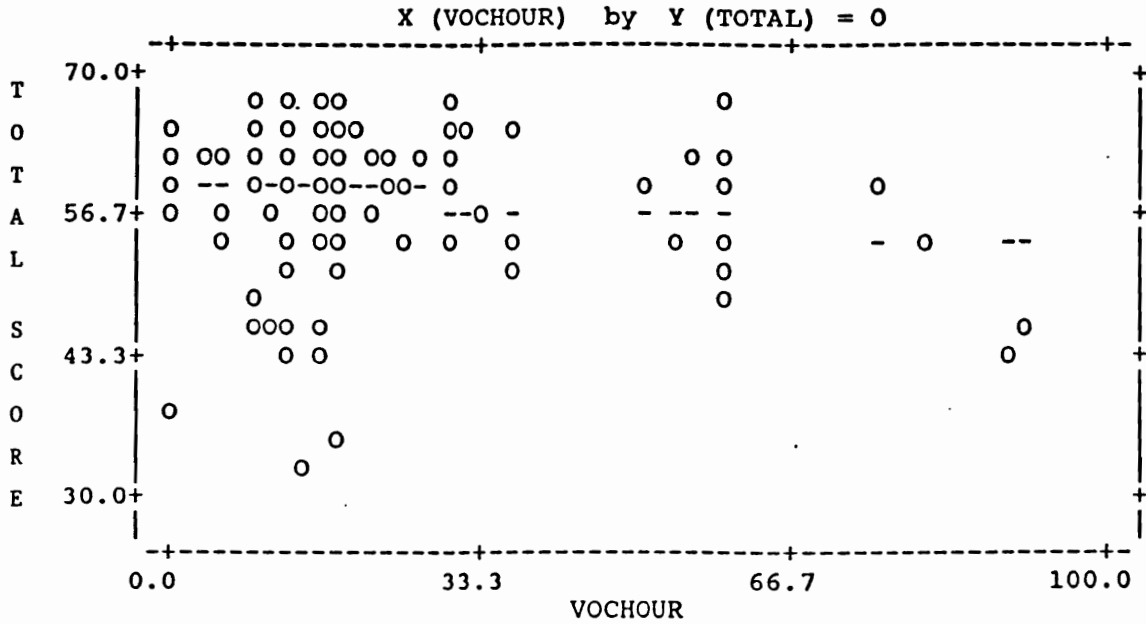


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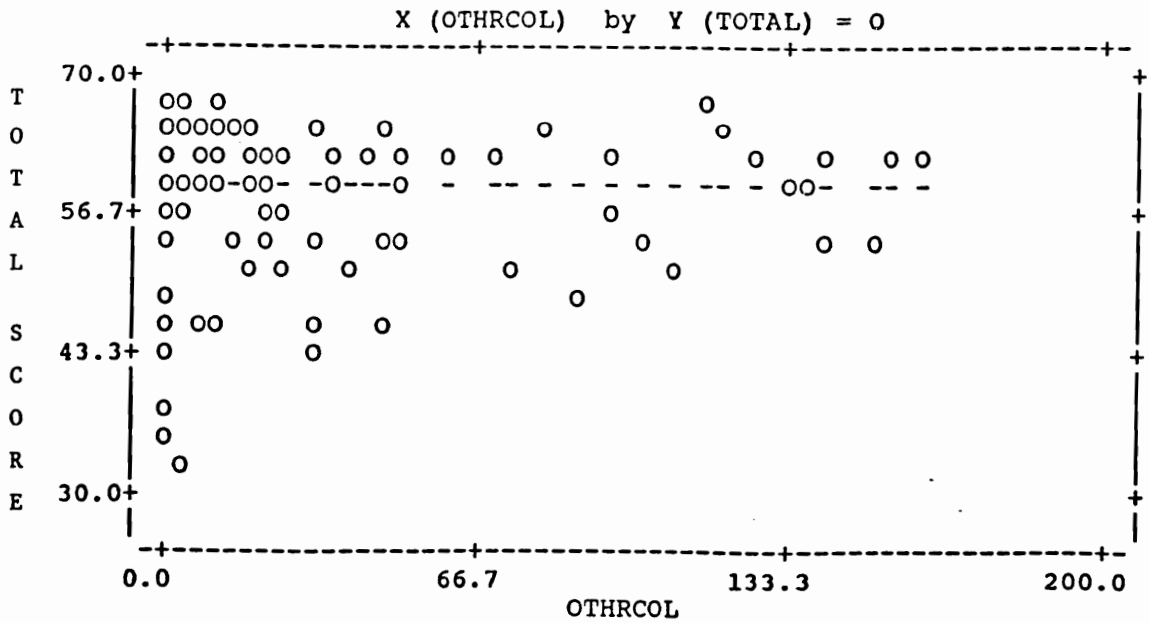
X (YRSTCHEX) by Y (TOTAL) = 0



Scatter Plots



Scatter Plots



**VITA**

ARTHUR WILEY MULLINS was born July 15, 1940, at Whitewood, Virginia. He is the son of Patsy Breeden Mullins and the late Wiley Mullins. He is married to Maxine Mullins, and they have one son, Shaun. Reared in the rural area of Buchanan County, Virginia, Arthur attended Mullins Mountain Elementary School, a one-room school, for the first five years of schooling, after which he transferred to Whitewood Combined School. He then attended Grundy Senior High School for his senior year, graduating in 1958.

His college years were interspersed with work experiences, but he received a BS Degree from Pikeville College in 1967. His Master's Degree was earned at Radford University in 1969, and the Certificate of Advanced Graduate Studies was awarded from VPI&SU in 1990. All requirements for the Doctor of Education Degree in Vocational and Technical Education from VPI&SU were completed in April, 1993.

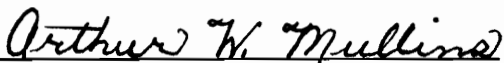
Art began his teaching career at a small rural school in Buchanan County. After teaching for several years at both elementary and high school levels, he became principal of Buchanan County Vocational School, where he served from 1969 to 1991, retiring on August 1, 1991. He also worked as

Coordinator of the Apprenticeship Program, Buchanan County Schools, 1970-90, and taught adult basic education during the years 1969-71.

In serving the youth of trade and industrial education, Art served as advisor of the Buchanan County Vocational School's Vocational Industrial Clubs of America (VICA), 1976-91, is past president of Virginia VICA Board of Directors, and was inducted into the VICA Hall of Honor in 1992.

He holds membership in the American Vocational Association, Virginia Vocational Association, National Association of Trade and Industrial Educators, Virginia Association of Trade and Industrial Educators, and Southwest Virginia T&I Association. He maintains membership in the National Education Association, Virginia Education Association, and Buchanan County Education Association. He is a member of the Southwest Virginia Chapter of Phi Delta Kappa.

Community activities include Boy Scouts, Community Corrections Board, Richlands Masonic Lodge, and Flatwoods Church of Christ.

  
Arthur Wiley Mullins