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ABSTRACT

A study was conducted to identify the competencies needed by students entering auto mechanics programs with emphasis on competencies which handicapped students either possess or could be expected to attain. The research was divided into two parts. First, through two rounds of questionnaires (modified Delphi Technique) mailed to a panel of twelve auto mechanics teachers in Texas, 48 of 76 competencies listed on the questionnaires were rated as those needed by students entering auto mechanics programs in secondary schools. Second, a panel of special education experts were provided with the list of 48 competencies and were asked to consider each in the light of six handicapping conditions. This information was designed to identify handicapping conditions which would usually prevent a student from possessing entry-level auto mechanics skills and to determine what special assistance could be given to handicapped students to enable them to meet the competencies. Some of the findings include the following: (1) the most needed competencies were social maturity skills; (2) special needs students already possessed most of the competencies needed for auto mechanics; (3) a classroom aide was the most commonly suggested assistance source; and (4) the competency considered most likely to remain out of reach of some of the handicapped students was the ability to drive a car. (JH)

# COMPETENCIES NEEDED BY STUDENTS ENTERING AUTOMOBILE MECHANICS PROGRAMS IN TEXAS SECONDARY SCHOOLS WITH EMPHASIS ON ACHIEVEMENT EXPECTATIONS FOR THE HANDICAPPED

A Summary Report of Research

Performed in Cooperation With the

U.S. Office of Education

and

Project ENCOUNTER

(ENcouraging Career Opportunities UNlimited Through Education and Rehabilitation)

B.O.A.E. Grant No. G007702536

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# FOREWORD

With the advent of federal legislation mandating the placement of handicapped students into the "least restrictive environment" in public schools, many unanswered questions have been raised by vocational educators. Do handicapped students possess essential entry level competencies necessary for placement into regular vocational education programs? If handicapped students do not possess the necessary competencies, can they develop such competencies? Can handicapped students be accomodated effectively in regular vocational education programs? What special services will be necessary in order to teach handicapped students effectively? Answers to these and other questions are being sought in an effort to do the best possible job in meeting the needs of handicapped students.

This research study by Jerry P. Davidson was undertaken in an effort to provide partial answers to some of these questions. The study was limited to the area of automobile mechanics, but similar methodology could be used by researchers to study other vocational areas. The findings, conclusions, implications, and recommendations reported will be of interest to vocational teachers, administrators, special education personnel, curriculum specialists, teacher educators, guidance personnel, and State Education Agency personnel.

For additional information on the study, the reader may contact the Vocational Special Needs Project ENCOUNTER Staff, Interdisciplinary Education Program, College of Education, Texas A&M University, College Station, Texas, 77843.

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March, 1979

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Special appreciation goes to Dr. Don Herring for his leadership in conducting the research and his counsel in the writing of the original report. Many other professors helped this research to completion, and I would like to thank them also for that assistance.

Jerry Davidson

# TABLE OF CONTENTS

# INTRODUCTION

Vocational education programs for the handicapped are not new in the United States. However, in the past few years there has been a tremendous increase in the national commitment toward expanding and improving the opportunities available for handicapped individuals.

The Rehabilitation Act of 1973 (Public Law 93-112) is the basic civil rights legislation for handicapped persons. Section 504 of this Act as amended (Public Law 93-516) specifically denies federal monies to any project or agency guilty of discrimination on the basis of handicap (Federal Register, Vol. 42, No. 86). This is important to educators, since most public schools receive some federal financial assistance.

The Educational Amendments of 1976 (Public Law 94-482) reflected a major change in the nation's social and economic awareness with a new impetus toward preparing all students for employment, and offered greater opportunities to handicapped students who had been excluded from some vocational programs (Federal Register, Vol. 42, No. 101).

In 1975, Congress passed an act directed toward insuring benefits and rights for all handicapped children and their parents. This was the Education for All Handicapped Children Act of 1975 (Public Law 94-142).

A portion of these regulations deals with the Individualized Education Program, or IEP. The IEP is a written statement for a

handicapped child which includes a statement of the specific special education and related services to be provided for the child, and the extent to which the child will be able to participate in regular educational programs. (Federal Register, Vol. 42, No. 163).

Implementation of the new laws concerning handicapped students being placed into the existing framework of public education is the responsibility of the states, the schools, and inevitably, the individual teachers.

Vocational education has not always welcomed handicapped students. In 1968, the Texas Education Agency publication Guide for Public Schools in Planning Programs of Vocational Education for In-School Students made this recommendation to Vocational Industrial Education teachers:

> Selection of students: Admission must be restructed [sic] to those who are physically and mentally competent to do the work required in the program and who possess qualifications necessary for employment in the occupation for which the training is offered. As a rule, mentally or physically handicapped do not profit from the instruction and are a serious source of danger to themselves and other students in working with machines and tools. (p. 68)

The federal legislation which followed 1968 precluded any more such language, however, and by 1977, special education students could be taken into regular vocational programs through the recommendation of the Admission, Review, and Dismissal (ARD) Committee on the local school level. The ARD Committee is composed of at least six members. There are:

1. A representative of the vocational department. This could be the director, a supervisor, counselor, or a vocational teacher.

2. The vocational teacher who will instruct the handicapped student if the ARD Committee approves.
3. A member of the craft committee or vocational advisory committee.
4. An experienced special education teacher.
5. A counselor (non-vocational).
6. The principle or an assistant principal.

Even after the ARD Committee approves the placement of the special education student into the vocational classroom, there is a trial period of two weeks to see that the arrangement is satisfactory (Texas State Plan for Vocational Education, 1977).

This ARD procedure accepts the student at his or her level, and offers vocational and special education personnel the opportunity to arrive at a joint solution to the problem of placement of a special needs student into a vocational program.

There was a need to identify entry-level competencies which may be expected of handicapped students, so that members of ARD Committees can make intelligent, consistent decisions concerning admittance of these students into a vocational program. This information would also be useful in the development of the IEP for a student so admitted.

The primary beneficiaries of this study will be the handicapped students who desire to take Auto Mechanics. Competencies needed and competencies possessed can be compared, and those students who need upgrading or extra work on certain skills could begin as early as junior high to prepare themselves for Auto Mechanics. Those who

teach Auto Mechanics will have access to information to help them decide what possibilities for learning can be offered to handicapped students.

Special education personnel who work daily with the handicapped can also benefit from the study by receiving information concerning competencies needed by students entering Auto Mechanics, thus enabling them to develop guidelines for those with special needs. Special Education Directors who oversee the special needs requirements of an entire school district can plan ahead for certain students who desire to enroll in Auto Mechanics when they have reached the proper level.

## OBJECTIVES

The purpose of this research was to identify those competencies needed by students entering Auto Mechanics programs which handicapped students either possess or could be expected to attain. To achieve this purpose, the following objectives were established.

1. To identify the competencies needed by students entering Auto Mechanics classes.
2. To identify handicapping conditions which would usually prevent a student from possessing the identified competencies.
3. To determine what special assistance could be given handicapped students to enable them to meet the competencies.

The need for such a study arose from recent Federal legislation concerning education for handicapped children. Public Law 94-142

speaks to the right of special needs students to be placed into the "least restrictive environment" (LRE), to receive a "free appropriate public education" (FAPE), and to have a personal plan of study known as an "individual education program" (IEP).

The IEP must be developed for every special needs student. There was a need to identify entry-level competencies which may be expected of handicapped students, so that members of the IEP committee could make intelligent, consistent decisions concerning admittance of these students into Auto Mechanics programs.

Students who desire to enroll in Auto Mechanics need to know what competencies will be expected of them. Auto Mechanics teachers need to know what to expect of students who are handicapped. Special education teachers need to know how to meet the needs of handicapped students enrolled in Auto Mechanics programs, and how to prepare younger students who will want to enroll in Auto Mechanics when they reach the eleventh grade. These needs were of utmost concern in the conduct of this study.

## RESEARCH PROCEDURE

To determine what skills were needed by a special needs student entering Auto Mechanics, the study was divided into two parts. First, competencies needed by any student entering Auto Mechanics were identified. A panel of 12 outstanding Auto Mechanics teachers was selected. Each was mailed the Round I questionnaire containing a list of 76 possible competencies needed by a student entering Auto Mechanics. These 76 competencies were derived from a review of the literature

and from the survey instruments developed in as
jects (Parrish, 1978; Swinney, 1978).

The competencies were divided into four ar
Computational Skills, Social Maturity Skills, a
The teachers were asked to rate each competency
as follows: 1 = Unnecessary; 2 = Desirable; 3
Critical. The respondents were asked to provid
rating, and space was provided for them to add
felt may have been omitted.

The Round II questionnaire was sent to the
porated the ratings from Round I. The teachers
rate the 76 competencies, but this time each wa
the items in relation to how the others had rat
This was done in an effort to bring about conse
cerning the rating of the competencies. This t
cation of the Delphi technique (Delbecq, Van de
1975).

When the Round II questionnaires were retu
each competency were averaged. A mean rating o
cut-off point for deciding whether or not a com
tained for use on Round III. On the 1 to 4 rat
median, mid-way between "Desirable" and "Valuab

Forty-eight competencies received a mean r
These were determined to be the competencies ne
Auto Mechanics, thus accomplishing the first ob

To accomplish objectives 2 and 3, a panel of special education experts was chosen. As was the case with the Auto Mechanics teachers, these educators were chosen with the aid of Texas Education Agency personnel. For Round III of the survey, these educators were provided the list of 48 Auto Mechanics competencies, and were asked to consider each in the light of six handicapping conditions: Visually Handicapped (VH), Aurally Handicapped (AH), Educable Mentally Retarded (EMR), Learning Disabled (LD), Orthopedically Handicapped (OH), and Emotionally Disturbed (ED).

The teachers were to make three decisions for each competency/handicapping condition combination:

1. Could a student with such a handicap be expected to meet the competency at the time of entry into Auto Mechanics?
2. If not, could the student meet the competency with special assistance, either before or after entry into Auto Mechanics?
3. If so, what kind of assistance would be the most appropriate?

There were five kinds of assistance to students listed on the instrument. There were:

1. Resource room assistance, either before or after enrollment into Auto Mechanics.
2. Individualized instruction, either before or after entry into Auto Mechanics.
3. Counseling

4. Modified Auto Mechanics curriculum to fit the special needs of the student.
5. An aide in the Auto Mechanics classroom for assistance to the teacher.

The information from Round III identified handicapping conditions which would usually prevent a student from possessing the entry-level Auto Mechanics competencies, and determined what special assistance could be given to handicapped students to enable them to meet the competencies.

## ROUND I AND ROUND II DATA

The twelve Auto Mechanics teachers who served as the panel of experts rated the 76 competencies in two rounds. The second instrument reminded them of how they had responded on the first, and showed how the competencies were rated by the other teachers. The purpose of this tactic was to attempt to bring concensus to the group.

The mean scores for the competencies were calculated. Because the rating scale ran from 1 to 4, any competencies which did not rate at least 2.5 on the second round were not considered as being essential for entry into Auto Mechanics, and [illegible]s were dropped from the third instrument which was sent to the [illegible] education experts. The 76 competencies are shown in Tables 1-5, along with mean ratings from each of the first two rounds.

Table 1 deals with the verbal skills needed by students entering Auto Mechanics. This section contains the only perfect 4.0 ratings of the entire survey. The Auto Mechanics teachers apparently believed the

TABLE 1

ROUND I AND ROUND II COMPETENCY RATINGS
MEAN SCORES AND CHANGES
VERBAL SKILLS

| Competency | Round I | Round II | Change |
|---|---|---|---|
| A. A student entering Auto Mechanics must be able to read in order to comprehend: | | | |
| 1. high school textbooks | 3.2 | 3.3 | +.1 |
| 2. written instructions | 3.5 | 3.6 | +.1 |
| 3. work orders | 3.1 | 2.9 | -.2 |
| 4. examinations | 3.3 | 3.7 | +.4 |
| 5. repair manuals | 3.5 | 3.4 | -.1 |
| B. A student entering Auto Mechanics must be able to spell and write well enough to compose: | | | |
| 6. work orders | 2.8 | 2.7 | -.1 |
| 7. examination answers | 3.4 | 3.4 | ± 0 |
| 8. personal letters | 1.8 | 1.7 | -.1 |
| 9. business letters | 1.8 | 1.7 | -.1 |
| 10. themes or reports | 1.8 | 2.0 | +.2 |
| C. A student entering Auto Mechanics must be able to: | | | |
| 11. listen attentively | 3.7 | 3.8 | +.1 |
| 12. follow orders when given orally | 3.9 | 4.0[a] | +.1 |
| 13. communicate easily with others | 3.2 | 2.9 | -.3 |
| 14. use a telephone | 2.0 | 1.9 | -.1 |
| Verbal Skills Grand Mean | 2.9 | 2.9 | ± 0 |

[a]The only competency to score 4.0 on the survey.

ability to follow instruction given orally to be a highly essential competency for entry level students. Four of the competencies did not make the 2.5 rating necessary for inclusion on the third round. Writing letters, themes, or reports were not seen as being highly important in Auto Mechanics class. Some of the teachers indicated that student use of the telephone was prohibited in their classes, while others noted that students were allowed to call out to order parts and tools. In any case, the use of the telephone was not a competency perceived as needed by all students entering Auto Mechanics.

As far as the computational skills were concerned, as seen in Table 2, there were mixed feelings about their importance to entering students. The very basic math functions were considered important, and all were retained for the third round of the survey. The rating of the competency of "adding" dropped mysteriously almost a full point between the two rounds. This was the largest change in means on the entire survey. The teachers did not consider the ability to use a calculator necessary for beginning Auto Mechanics students.

Despite the imminent change to the metric system, the teachers downplayed the importance of familiarity with that system of measuring. None of the competencies dealing with measuring in metric units made the 2.5 cut-off necessary for inclusion in the third round. There was a feeling expressed by some that metric tools, metric volumes, and so forth were useful only for foreign autos, and apparently not many foreign autos were being repaired in the Auto Mechanics laboratories.

Money management skills were also not considered highly important

TABLE 2

ROUND I AND ROUND II COMPETENCY RATINGS
MEAN SCORES AND CHANGES
COMPUTATIONAL SKILLS

| Competency | Round I | Round II | Change |
|---|---|---|---|
| A. A student entering Auto Mechanics must be able to perform with accuracy these basic math skills: | | | |
| 1. counting | 3.5 | 3.5 | ± 0 |
| 2. adding | 3.7 | 2.8 | -.9[b] |
| 3. subtracting | 3.5 | 3.5 | -.1 |
| 4. multiplying | 2.8 | 3.3 | +.5 |
| 5. dividing | 2.8 | 3.4 | +.6 |
| 6. using decimals | 3.2 | 3.2 | ± 0 |
| 7. using fractions | 3.2 | 3.0 | -.2 |
| 8. using percentages | 2.8 | 2.8 | + 0 |
| 9. using a calculator | 1.4 | 1.3 | -.1 |
| B. A student entering Auto Mechanics must possess the following measuring skills: | | | |
| 1. linear-English system | 3.2 | 3.2 | ± 0 |
| 2. linear-metric system | 2.3 | 2.0 | -.3 |
| 3. volume-English system | 2.7 | 2.6 | -.1 |
| 4. volume-metric system | 2.1 | 1.9 | -.2 |
| 5. temperature-English system | 2.9 | 2.9 | -.1 |
| 6. temperature-metric system | 2.3 | 1.9 | -.4 |

TABLE 2 (continued)

| Competency | Round I | Round II | Change |
|---|---|---|---|
| C. A student entering Auto Mechanics must possess the following money management skills: | | | |
| 1. counting | 2.8 | 2.8 | ± 0 |
| 2. making change | 2.3 | 2.0 | -.3 |
| 3. computing sales tax | 2.3 | 2.0 | -.3 |
| 4. charging purchases | 1.9 | 1.7 | -.2 |
| 5. bookkeeping | 1.9 | 1.8 | -.1 |
| D. A student entering Auto Mechanics must be able to read and interpret: | | | |
| 1. graphs | 2.0 | 1.7 | -.3 |
| 2. charts | 2.2 | 2.0 | -.2 |
| 3. dials/gauges | 2.8 | 2.1 | -.7 |
| 4. scale drawings | 2.0 | 1.9 | -.1 |
| 5. maps | 1.6 | 1.6 | ± 0 |
| Computational Skills Grand Mean | 2.6 | 2.4 | -.2 |

[b]Largest change in mean score between the two rounds.

for entering students. Many teachers explained that students were not allowed to handle money in class. Only the competency of "counting money" was ranked high enough to be included on Round III.

Entering students were also not expected to know how to read charts, graphs, maps, scale drawings, or the like. Based on reasons given by teachers for these ratings, it was not that they considered

these skills unimportant, but rather that students would be taught the correct way to use these things after entering the program.

As shown in Table 3, social maturity skills were rated the highest of any area as far as competencies needed for entering students. The teachers seemed to feel that any student who would make an effort to learn could be taught.

In this respect, the Auto Mechanics teachers are not alone. All teachers would love to have the students who are well-behaved, want to learn, and come to class every day. What is significant, perhaps, is that fact that so many of these social competencies were rated as high as they were. A full one-third of them were rated 3.5 or higher, meaning the teachers considered them critical. Showing concern for safety was highest with a rating of 3.9. Those skills dealing with shop practices were often rated higher than those which dealt with interpersonal relationships. Of the entire list of 21 social skills, only "plan work effectively" was not rated high enough to be included on Round III. There seemed to be a feeling among the teachers that work for the students in class would be pre-planned.

As can be seen in Table 4 (page 15), it was apparently the belief of the teachers that most skills which deal with Auto Mechanics could be taught in the classroom and shop. On this portion of the instrument, only those skills which are not normally taught, such as "distinguish colors" and "distinguish shapes and forms" were rated as important competencies for students entering Auto Mechanics. The illogical responses of two items in this section should be noted. The teachers thought it

TABLE 3

ROUND I AND ROUND II COMPETENCY RATINGS
MEAN SCORES AND CHANGES
SOCIAL MATURITY SKILLS

| Competency | Round I | Round II | Change |
|---|---|---|---|
| A. A student entering Auto Mechanics must be able to: | | | |
| 1. work well in a group | 3.5 | 3.4 | -.1 |
| 2. work independently | 3.3 | 3.1 | -.2 |
| 3. follow through on a task | 3.5 | 3.5 | ± 0 |
| 4. be responsible for equipment | 3.3 | 3.3 | ± 0 |
| 5. show concern for safety | 3.8 | 3.9 | +.1 |
| 6. take pride in work | 3.4 | 3.5 | +.1 |
| 7. show initiative to learn | 3.5 | 3.8 | +.3 |
| 8. know and exhibit proper behavior | 3.4 | 3.4 | ± 0 |
| 9. have a neat personal appearance | 3.0 | 3.0 | ± 0 |
| 10. attend class regularly | 3.9 | 3.9 | ± 0 |
| 11. recognize and respect authority | 3.2 | 3.2 | ± 0 |
| 12. adapt to change | 2.8 | 2.8 | ± 0 |
| 13. realize the value of time | 2.8 | 2.6 | -.2 |
| 14. plan work effectively | 2.5 | 2.3 | -.2 |
| 15. benefit from the course | 3.7 | 3.4 | -.3 |
| 16. be punctual | 3.7 | 3.8 | +.1 |
| 17. display a wholesome relationship with parents and other adults | 3.0 | 2.8 | -.2 |
| 18. display consideration for others | 2.9 | 2.8 | -.1 |
| 19. exercise good personal hygiene | 3.2 | 3.2 | ± 0 |
| 20. exercise self-discipline | 3.2 | 3.1 | -.1 |
| 21. learn from mistakes | 3.5 | 3.5 | ± 0 |
| Social Skills Grand Mean | 3.3 | 3.3 | ± 0 |

TABLE 4

ROUND I AND ROUND II COMPETENCY RATINGS
MEAN SCORES AND CHANGES
SPECIALIZED SKILLS

| Competency | Round I | Round II | Change |
|---|---|---|---|
| A. A student entering Auto Mechanics must be able to: | | | |
| 1. recognize common hand tools | 2.7 | 2.5 | -.2 |
| 2. use common hand tools | 2.1 | 2.0 | -.1 |
| 3. left heavy objects | 2.3 | 2.2 | -.1 |
| 4. drive an auto | 3.1 | 3.1 | ± 0 |
| 5. work in close quarters | 2.8 | 2.6 | -.2 |
| 6. check fluid levels in an auto | 1.8 | 1.6 | -.2 |
| 7. operate equipment with hand/ foot controls. | 2.3 | 2.2 | -.1 |
| 8. change a tire | 1.7 | 1.3 | -.4 |
| 9. distinguish colors | 3.1 | 3.3 | +.2 |
| 10. distinguish shapes and forms | 3.1 | 3.4 | +.3 |
| 11. distinguish odors | 2.7 | 2.5 | -.2 |
| 12. judge distances | 2.8 | 2.4 | -.4 |
| 13. start a car with jumper cables | 1.8 | 1.6 | -.2 |
| 14. open the hood of a car | 2.0 | 1.9 | -.1 |
| 15. diagnose problems | 2.2 | 1.6 | -.6 |
| 16. start a car with an ignition key | 2.7 | 2.3 | -.4 |
| Specialized Skills Grand Mean | 2.5 | 2.3 | -.2 |

valuable for students to enter the class with the ability to drive (3.1 rating), but not so important to be able to start a car with an ignition key (2.3 rating).

Summary of Findings: Round I and Round II

Most of the changes in mean scores between the two rounds were small, with only nine changes greater than .4 of a point. Only three changes were made which eliminated competencies from inclusion in Round III. There were 18 comptencies which showed no change in mean between the two rounds. There were 14 which changed positively (average change = +.2) and 44 changed in a negative direction (average change = -.2).

The grand means from Round II of each of the four areas of competency are summarized below in Table 5.

TABLE 5

GRAND MEANS OF THE FOUR COMPETENCY AREAS
ROUND II

| Competency Area | Grand Means |
|---|---|
| Verbal skills | 2.9 |
| Computational skills | 2.4 |
| Social maturity skills | 3.3 |
| Specialized skills | 2.3 |

The social maturity skills rated highest, by almost a half-point over the second area, verbal skills, and a full rating point above the

other two areas. This heavy emphasis on social development weighted Round III in favor of these comptencies, as 20 of the eventual 48 itmes on that round were social competencies.

Round I and Round II of the survey achieved the first objective of the research, that of identifying competencies needed by students entering Auto Mechanics programs. The 12 Auto Mechanics teachers who participated in this study were determining competencies needed by all students, regular and students with special needs. The information gained by this portion of the research is intended to be used by everyone interested in entry level Auto Mechanics skills.

## Round III Data

The original 76 competencies of the first two rounds were reduced to 48 for Round III by including only those competencies which received a rating of 2.5 or higher on Round II. For this portion of the study, ten special needs educators which had been identified as a panel of experts were asked to evaluate each competency in respect to six handicapping conditions, and reply as to whether or not each handicapping condition would or would not prohibit a student from either having or acquiring that competency. Specifically, each was asked to answer three questions. First, would a student with the handicap be likely to possess the competency coming into the Auto Mechanics class? If not, could that student attain the competency with proper assistance? If so, which type(s) of assistance would be the most beneficial to the student in acquiring the competency?

Replies of only nine special education experts were reported because the instrument completed by one of them was unusable.

For clarity, each of the six handicapping conditions was considered separately in the display of data in this study. In this way, a person who has in mind a student with a specific handicap would be able to concentrate on just that portion of the data which is the most pertinent.

Table 6 shows the actual number of the nine panel members who indicated a competency could not be met by a student with a specified handicap. Table 7 indicates the total number of times, from Round III, the panel indicated a specific type of assistance would be helpful to a student with a handicap.

TABLE 6

SUMMARY OF ROUND III
NUMBER OF TEACHERS WHO INDICATED
A COMPETENCY CANNOT BE MET

(N=9)

| Competency | Handicapping Condition VH | AH | EMR | LD | OI | ED |
|---|---|---|---|---|---|---|
| A. Verbal Competencies<br>A student entering Auto Mechanics must be able to read in order to comprehend: | | | | | | |
| 1. high school level textbooks | | | 2 | | 1 | |
| 2. written instructions | | | 1 | | | |
| 3. work orders | | | 1 | | | |
| 4. examinations | | | 1 | | | |
| 5. repair manuals | | | 1 | | | |
| A student entering Auto Mechanics must be able to spell and write well enough to compose: | | | | | | |
| 6. work orders | | | 1 | | | |
| 7. examination answers | | | | | 2 | |
| A student entering Auto Mechanics must be able to: | | | | | | |
| 8. listen attentively | | | | | | |
| 9. follow directions when given orally | | | | | | |
| 10. communicate easily with others | | | | | | |

TABLE 6 (continued)

| Competency | Handica VH | AH |
|---|---|---|
| B. Computational Competencies<br>A student entering Auto Mechanics must be able to perform with accuracy these basic math skills: | | |
| 1. counting | | |
| 2. adding | | |
| 3. subtracting | | |
| 4. multiplying | | |
| 5. dividing | | |
| 6. using decimals | | |
| 7. using fractions | | |
| 8. using percentages | | |
| 9. measuring in inches and feet | | |
| 10. measuring in pints, quarts, and gallons | | |
| 11. measuring in degree Fahrenheit | | |
| 12. counting money | | |
| C. Social Competencies<br>A student entering Auto Mechanics must be able to: | | |
| 1. work well in a group | | |
| 2. work independently | | |

TABLE 6 (continued)

| Competency | Handicapping Condition VH | AH | EMR | LD | OI | ED |
|---|---|---|---|---|---|---|
| 3. follow through on a task | | | | | | |
| 4. be responsible for equipment | | | | | | |
| 5. show concern for safety | | | | | | |
| 6. take pride in work | | | | | | |
| 7. show initiative to learn | | | | | | |
| 8. know and exhibit proper behavior | | | | | | |
| 9. have a neat personal appearance | | | | | | |
| 10. attend class regularly | | | | | | |
| 11. recognize and respect authority | | | | | | |
| 12. adapt to change | | | | | | |
| 13. realize the value of time | | | | | | |
| 14. benefit from the course | | | | | | |
| 15. know value of being punctual | | | | | | |
| 16. display wholesome relationship with parents and other adults | | | | | | |
| 17. display consideration for others | | | | | | |

TABLE 6 (continued)

| Competency | Handicapping Condition VH | AH | EMR | LD | OI | ED |
|---|---|---|---|---|---|---|
| 18. exercise good personal hygiene | | | | | | |
| 19. exercise self-discipline | | | | | | |
| 20. learn from mistakes | | | | | | |
| D. Specialized Competencies A student entering Auto Mechanics must be able to: | | | | | | |
| 1. recognize common hand tools | | | | | | |
| 2. drive an auto | 4 | 1 | 2 | 1 | 2 | 1 |
| 3. work in close quarters | | | | | | |
| 4. distinguish colors | 2 | | | | | |
| 5. distinguish shapes and forms | | | | | | |
| 6. distinguish odors | | | | | | |

TABLE 7

TOTAL SUGGESTED ASSISTANCE
FOR ALL HANDICAPPING CONDITIONS

| Type of Assistance | Total Number of Times Suggested for Each Handicapping Condition VH | AH | EMR | LD | OI | ED | Total |
|---|---|---|---|---|---|---|---|
| resource room assistance | 10 | 2 | 71 | 40 | 1 | 17 | 141 |
| individualized instruction | 22 | 8 | 77 | 16 | 6 | 24 | 147 |
| counseling | 0 | 0 | 16 | 8 | 1 | 55 | 80 |
| modified Auto Mechanics curriculum | 40 | 15 | 59 | 9 | 4 | 5 | 132 |
| aide in the Auto Mechanics classroom | 16 | 20 | 92 | 46 | 5 | 71 | 250 |
| Total | 88 | 45 | 315 | 89 | 17 | 172 | |

## Findings Related to Objective One

Objective One of the study dealt with the identification of competencies needed by any student entering Auto Mechanics. These findings reflect the opinions of the panel of Auto Mechanics teachers concerning those competencies.

1. Forty-eight competencies received a mean rating of 2.5 or higher, and were determined to be important for students entering Auto Mechanics.
2. Social maturity skills were the most important competencies for students entering Auto Mechanics classes. The grand mean for each of the competency areas, as derived from Round II, were: Social Maturity, 3.3; Verbal, 2.9; Computational, 2.4; and Specialized, 2.3.
3. The teachers indicated very little change of opinion between the first two rounds of the survey. Only three additional competencies fell below the 2.5 mean rating after the Round II questionnaire.

## Findings Related to Objectives Two and Three

Objectives two and three dealt with the identification of handicapping ocnditions which would prevent a student from possessing the competencies identified by the first two rounds of the survey, and the determination of the types of special assistance which would help overcome those handicaps. These findings are based on the responses of the panel of special education experts on Round III.

1. Most of the competencies needed for beginning Auto Mechanics students were viewed by the panel of special education teachers as already possessed by the special needs students. Those that were not seen as possessed were considered to be attainable with some measure of extra assistance.
2. The competency considered the most likely to remain out of reach for some of the handicapped students was the ability to drive a car. It was the only one in which the panel evidenced a tendency to show a "cannot meet or attain" opinion across all six handicapping conditions.
3. As far as assistance sources to handicapped students, the help most commonly suggested was that of an aide in the classroom. This was followed respectively by individualized instruction, resource room assistance, modified Auto Mechanics curriculum, and counseling.
4. Visually handicapped students would encounter the most difficulty in reading and writing skills, and in driving a car. The best resource for assistance would be a modified Auto Mechanics curriculum.
5. Aurally handicapped students should have little or no trouble in meeting most competencies for admission into Auto Mechanics. In instances where help was needed, an aide in the classroom was suggested most often.
6. Educable mentally retarded students may have some difficulty with the competencies dealing with reading, writing, and

driving. An aide in the classroom was most often suggested as help for these students.

7. Learning disabled students should have few problems in meeting the competencies. An aide in the classroom was noted as the most likely channel of assistance for these students.
8. Students with orthopedical handicaps should function as well as all other students in Auto Mechanics, except for those instances which call for specific physical activity. Individual instruction would be of the most assistance in these cases.
9. Verbal skills for emotionally disturbed students may vary substantially, as may computational skills. Social maturity skills are obtainable, if counseling is provided. An aide in the classroom would also help these students.

## Conclusions

From the findings of the three rounds, these conclusions were drawn:

1. The most needed competencies for beginning Auto Mechanics students were social maturity skills.
2. Specialized Auto Mechanics skills were the least important for entering students.
3. The 48 competencies derived from Round I and Round II are important to all entering Auto Mechanics students, not just handicapped students.
4. The opinion of Auto Mechanics teachers regarding the importance of competencies for entering students was influenced only

minimally by the use of two suvey rounds in an attempt to reach concensus.

5. No competencies were viewed as unattainable for handicapped students, even though specialized assistance for these students was suggested in many cases.
6. An aide in the classroom would be a major source of assistance to an Auto Mechanics teacher with one or more special needs students in his class, and other means of assistance would be important at times.

## Implications

From the conclusions, the following implications can be deduced concerning the data gathered:

1. Because of the importance Auto Mechanics teachers place in social maturity skills, there should be more emphasis placed on these skills in the educational process. There is apparent justification of teaching citizenship, behavior, and courtesy as part of the school curriculum.
2. Auto Mechanics teachers expect entering students to have social maturity. Most other skills, however, can be developed in students through class and shop instruction.
3. Some special needs students, while able to attain the competencies needed for entering Auto Mechanics, may require extra help and assistance in fully meeting these competencies. The best help would be an aide in the classroom, but there are assistances such as individualized instruction, resource rooms,

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and counseling which can help the student acquire the competencies.

## Recommendations

As a result of conducting this study, several recommendations are made which would enable this material to gain greater usefulness.

1. The information gathered by this study should be made available to every school district in Texas. It is important for public school personnel to note that the findings tend to maximize the importance of social maturity skills, and minimize the differences between handicapped and non-handicapped students.
2. As far as teaching methods, Auto Mechanics teachers need to become familiar with techniques they can use in the classroom and shop. Special training should also be given to special education teachers to make them aware of the competencies needed by all Auto Mechanics students.
3. Students who are not eligible for Auto Mechanics because they are not in the 11th or 12th grade, and desire to enter the course when they reach that level should become familiar with the 48 competencies derived herein and prepare themselves accordingly. Counselors and special education teachers should assist these students when necessary.
4. More money should be alloted to the local school districts to help defray the costs of hiring special classroom aides.

5. The competencies derived by this study should be validated by further research.
6. A study should be conducted to ascertain the present ability of schools to teach handicapped students in Auto Mechanics. Attitudes, barriers, equipment and facilities, and other factors need to be explored before some of the recommendations of this study can be carried to their logical conclusion.
7. This study and the companion studies dealt only with Auto Mechanics, Vocational Agriculture I and Homemaking I. Other vocational areas should be studied for entry-level competencies.
8. Follow-up studies should be made of handicapped students who are products of regular Auto Mechanics programs.

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