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ABSTRACT

This document describes Connecticut's PRO-TECH Program, which is designed to link pupils in vocational-technical schools, resources of school and community, and opportunity for growth in order to teach advanced skills, explore new interests, challenge old ideas, and highlight individual talents. The document consists of sections on the following program-related topics: (1) an introduction and rationale for the program; (2) research on gifted children in Connecticut since 1979, some of which recognized giftedness in automotive mechanics, machine design, carpentry, electronics, architectural design, and concluded that programs and services above what was offered in the regular curriculum were warranted; (3) the PRO-TECH model for identification and programming to teach advanced skills, explore new interests, challenge old ideas, and highlight individual talents; (4) the program's goals and objectives; (5) the populations served (students who are capable of creative production in a trade area, traditional academic areas, and the arts) with identification being keyed not to potential but to performance; (6) entrance into the program; (7) types of services and opportunities; (8) levels of services; (9) an example of one student's activities in the PRO-TECH program; and (10) PRO-TECH and the mission of Connecticut's vocational-technical schools. The document includes a 10-item bibliography and two flowcharts that depict the process through which vocational-technical students become eligible for special services in the PRO-TECH program and through which they become eligible for special services in the arts component of the program. (CML)

THE PRO-TECH Program

A Program For Gifted and Talented High School Students In Connecticut's Vocational-Technical School System

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PRO-TECH Model for Education of the Gifted & Talented

PRO-TECH Model for Education of the Gifted & Talented

Introduction and Rationale

Historically, American education has been committed to a belief in individual differences and an equal opportunity for each person to achieve to the maximum of his or her ability (Clark, Klein, & Burks, 1965; Henry, 1920). Toward that goal, extensive progress has been made on behalf of the disadvantaged and the handicapped. Individualized educational programs are available for every handicapped student. Without federal and state statutory guarantees, however, less has been done for gifted and talented students.

Nationally, gifted and talented adolescents in junior and senior high schools are generally without comprehensive programs. For one sub-population, the vocational-technical high school student, gifted and talented programs have been nonexistent (Phelps, 1978). Dr. Carl J. Schaefer of Rutgers University underscored the problem, "The forgotten student on the American education scene today is the gifted and talented student interested in vocational education" (Milne, 1982, p. 1).

The need for comprehensive programs at the secondary level has been documented in a national study. One respondent in that study is quoted as saying, "We are losing these children in grades seven to nine. They can make it through almost any kind of elementary program, but once they discover junior high or high school is no improvement, a lot of them fall apart" (Gallagher, Weiss, Oglesby, & Thomas, 1983, p. 9).

For more than twenty years Connecticut has been a leader in the recognition of gifted and talented children and in the provision of appropriate programs for them. Public Act 10-76 requires that every public school system in Connecticut, including the Vocational-Technical School System, identify those gifted and talented students in its schools. Districts may choose to provide programs for its identified students, but the law does not mandate them to do so. At last count, over 150 of the 169 municipalities offered some type of approved program for their high-ability children. Every public school district is required by the Connecticut Legislature to submit "to the State Department of Education a plan for programs and services for gifted and talented students in grades 1-12" with percentages of students and estimated costs of full implementation as of 1993-94.

Approved programs are eligible to be reimbursed by the State Department of Education at the same rate as the district's special education reimbursement. Reimbursement is not received for gifted and talented programs in the Vocational-Technical School System, however.

The State of Connecticut does not endorse, or restrict approval to any single program model. If a program meets the requirements contained in Policies, Procedures and Guidelines . . . For Gifted and Talented Programs Under Section 10-76 (a-q) of the General Statutes approval should be obtained. One such model is the Revolving Door Identification Model. It is the model which provides the philosophical and programmatic basis for the Vocational-Technical School System's Pro-Tech Program. While the Pro-Tech Program will be explained below, it may be helpful to first present some of the features of the RDIM.

Revolving Door Identification Model. The model was developed by Professor Joseph S. Renzulli and his associates at the University of Connecticut. The research base for the model was obtained from eleven pilot districts throughout the State of Connecticut. RDIM programs identify a "talent pool" which will "vary in size from district to district but will ordinarily include 15-20% of the general population of students served by the gifted and talented program" (Conn. SDE, 1983). Students in the talent pool are referred to as potentially gifted or capable of gifted behavior. The manifestation of "giftedness" comes about when a member of the talent pool focuses his/her ability, creativity, and task commitment (motivation) upon an advanced investigation. "The percentage of talent pool students entering advanced level services . . . will not exceed 10% of the general population being served" (Conn. SDE, 1983). That 10% must consist of no more than 5% gifted and 5% artistically talented. Individual students may engage in several advanced investigations as long as the number of such students does not exceed the above percentages in any one year.

Talent pool students receive a number of services including specific enrichment experiences and modifications of their curriculum. The purpose is to stimulate interests and generate advanced-level follow-up. The talent pool experience may be regarded as an on-going identification process which comes to fruition when a student focuses her/his ability, creativity, and task commitment toward some creative production. In a real sense, the gifted and talented student has self-identified.

The broadened definition of giftedness and the talent pool concept provided the rationale for an identification study in three VT schools. The result of the study will be presented below.

Early research in the Vocational-Technical Schools

In a 1979 publication, the Connecticut State Department of Education recognized that several types of giftedness exist among the State's youth. In addition to the traditional academic and arts abilities, the document calls attention to "those who exhibit evidence of advanced skills and creative ability in the various technical specialties such as automotive mechanics, machine design, carpentry, electronics, architectural design, etc." (Conn. SDE, CONNCEPT I, p. 17).

In 1982 the Vocational-Technical School System, Connecticut Department of Education, commissioned a study at three Vocational-Technical Schools to determine if there were students enrolled in the schools who warranted differentiated educational programs and services. Measures of general ability, creativity, and motivation were applied to students in selected trade shops. An analysis of the results suggested that the percentage of potentially gifted and talented students in the populations studied was comparable to percentages found in regular high schools. Nineteen percent of the students qualified for inclusion into a talent pool.

From the above information, the following conclusions were drawn:

1. Given the current knowledge about giftedness, those abilities, interests, and achievement areas associated with vocational-technical education are valid performance areas for gifted and creative production;

2. The percentage of talent pool students in Connecticut's Vocational-Technical Schools is comparable to percentages in regular high schools;

3. Students identified as potentially gifted or talented in the trades are in need of special programs and services above and beyond what is offered in the regular curriculum;

4. Special programs and opportunities beyond those normally provided by the regular school program are warranted so that the gifted and talented youth in Connecticut's Regional Vocational-Technical Schools may realize their potential for the benefit of self and society.

At this time, programs for the gifted and talented are operating in four Vocational-Technical Schools; H.C. Wilcox VTS in Meriden, Emmett O'Brien VTS in Ansonia, Howell Cheney VTS in Manchester, and A. I. Prince VTS in Hartford. A program has been authorized at W. F. Kaynor VTS in Waterbury, and a Coordinator is being sought for that school.

PRO-TECH Model for identification & programming

The PRO-TECH Program is a program for gifted and talented students in the Vocational-Technical high schools in the State of Connecticut. It is patterned after the Revolving Door Identification Model which is approved by the Connecticut State Department of Education for implementation by local school districts.

THE PROGRAM IS DESIGNED TO LINK:

P - PUPILS IN VOC-TECH SCHOOLS,
R - RESOURCES OF SCHOOL & COMMUNITY, AND
O - OPPORTUNITIES FOR GROWTH;

IN ORDER TO:

T - TEACH ADVANCED SKILLS,
E - EXPLORE NEW INTERESTS,
C - CHALLENGE OLD IDEAS, AND
H - HIGHLIGHT INDIVIDUAL TALENTS.

Program goals and objectives

The following general goals which were adapted from Renzulli (1977) guide decisions relative to programmatic objectives and activities. The broad goals of the PRO-TECH Program are:

1. To provide various types and levels of enrichment to a broader spectrum of the school population than the three to five percent usually served in traditional programs for the gifted;

2. To integrate [the PRO-TECH Program with the regular classrooms and trade shops] and to develop a cooperative relationship between VT instructors and Pro-Tech staff;

3. To minimize concerns about elitism and the negative attitudes that are often expressed toward students participating in special programs for the gifted and talented;

4. To improve the extent and quality of enrichment for all students and to promote a "radiation of excellence" (Ward, 1961) throughout all aspects of the Vocational-Technical School environment.

The following program goals and objectives have been established for the PRO-TECH Program:

1. Identify all students in Connecticut's Vocational-Technical School System who, in view of their potential for outstanding performance in the trades, academics, or arts, are in need of special services for the gifted and talented.

1.1 Administer the Differential Aptitude Test to students in the V-T schools;

1.2 Obtain teacher recommendations and ratings for any students who were not identified through testing but who may need special services;

1.3 Administer the Torrance Test of Creative Thinking (Figural) to identify students with artistic potential;

1.4 Encourage students to self-nominate for inclusion in the program.

2. Provide a program for the gifted and talented which is an integral part of the instructional program at each Regional Vocational-Technical School.

3. Implement a program which maintains a balance among the intellectual, emotional, social, cultural, and physical growth of the gifted and talented students:

3.1 Establish a coordinator at each Regional Vocational-Technical School.

3.2 Schedule a balanced program of enrichment activities in each school.

3.3 Develop a counseling program to meet the unique needs of gifted students.

4. Establish liaison with the "sending" schools, higher education, and industry:

4.1 Explain the Pro-Tech Program to the administrative and guidance personnel at each feeder school in a region.

4.2 Participate in organizations and activities for the awareness and improvement of education for the gifted and talented.

5. Recognize and encourage the development of abilities in unusual trade areas as well as the traditional trades.

5.1 Expose students to general experiences which are in addition to the typical trades.

6. Stimulate students who are capable of outstanding performance to develop their special abilities:

6.1 Assess each Pro-Tech student's particular and unique interests, strengths, and learning styles.

6.2 Encourage each Pro-Tech student to pursue advanced level projects and activities related to his/her interests and strengths.

7. Involve and utilize resources within the school and community to develop an awareness of performance areas outside of the regular curriculum.

7.1 Develop a file of in-school and community resource persons.

8. Organize regular training of administrators and the staff who provide special services to gifted and talented students.

9. Conduct a periodic (5-year) evaluation of the program.

9.1 Gather data at each Regional Vocational-Technical School to assess the program's development and effectiveness.

Populations served by the PRO-TECH Program

The identification model used for the PRO-TECH Program is designed to identify students who are capable of creative production in (1) a trade area; (2) traditional academic areas; and (3) the arts. Traditional identification systems tend to be based almost exclusively upon aptitude. PRO-TECH looks at aptitude as one dimension, but it is really a production-based identification. Utilizing research from educational psychology and industrial psychology we are able to state who is *probably* capable of outstanding performance, but final determination is based on a student's creative-productive *response* to unique and advanced stimuli. Final identification of a student as **gifted or talented** depends on what that student actually does with his or her potential.

Entrance into the program

The procedures used for entrance into the program are based upon research. Any student who has a need for advanced services will receive those services when that need is demonstrated, whether or not the student was previously admitted to the program. Entrance into the PRO-TECH talent pool is voluntary, and may occur at any time through any one of the following:

1. Scores at or above the 95th percentile (local norms) on the Verbal Reasoning + Numerical Ability subtests of the Differential Aptitude Test

which is administered to all 9th Graders in schools having Pro-Tech Programs; **or**

2. Scores at or above the 85th percentile on **each** of the Abstract Reasoning, Space Relations, and Mechanical Reasoning subtests of the DAT; **or**

3. Superior scores on other tests of special abilities, e.g.; the Torrance Test of Creative Thinking (Figural); **or**

4. Instructor nominations; **or**

5. Self-nomination supported by a portfolio or other examples of creative production.; **or by a**

6. Director's Special Nomination.

All potential members of the talent pool are reviewed by a Screening Committee consisting of administrators, instructional staff, and pupil services personnel. The **maximum** number of students designated as eligible for limited services is 20 % of the school's population. Although entered into the program's talent pool, students are **not** designated as **gifted or talented** at this point.

Types of services and opportunities

All students in the PRO-TECH talent pool receive individual assessments of their interests, strengths, and learning styles. Students who need advanced work in academics are scheduled into "talent pool classes" which we designate as Challenge Classes. Those advanced classes are offered in language arts, mathematics, science, and social studies. At the present time, they operate at H.C. Wilcox VTS, Emmett O'Brien VTS, and Howell Cheney VTS.

Based upon an analysis of students' interests, general enrichment activities are scheduled in each school. Assistance in selecting and scheduling activities is provided by an Enrichment Team which consists of instructors, parents, students, and local business leaders. Activities are frequently open to the larger student population. At times, an entire class or grade-level may be invited to attend a particular presentation.

Levels of services

There are six levels of services. Each level is based upon students' needs at particular times. The first five levels represent the **continuing identification process** specified by the Connecticut State Department of Education for RDIM-type programs.

Level 1: Individual Assessment of Strengths & Interests

Provided to all students who enter the talent pool.

Level 2: Advanced Academic Classes

Intended for talent pool students whose strengths indicate that

advanced classes are appropriate for **part** of their academic curriculum. Those students are scheduled into **Challenge Classes** on the basis of ability and interest. Every PRO-TECH member is not necessarily in a Challenge Class.

Level 3: General Exploratory Activities (Type I)

Directed at general interests and abilities of members of the talent pool. Type I Enrichment is frequently open to all members of a class, grade, or school. Throughout the school year, approximately half of those who attend are **not** members of Pro-Tech. The topics of Type I Enrichment are always purposefully planned and outside of the existing curriculum.

Level 4: Advanced, Interest-specific Enrichment

Scheduled for small groups of PRO-TECH students who have advanced interests in a topic. Invitations may be extended to other students and their Instructors. Level 4 activities are **specific** Type I's.

Level 5: Skill Training Activities (Type II)

Specific skill-training in such areas as creativity, problem solving, higher level thinking, advanced trade skills needed to complete a Type III project, or other processing skills as needed. Type II Enrichment is provided individually and in groups to talent pool members and students engaged in advanced investigations.

Level 6: Advanced Investigations (Type III)

Students who are "turned on" to an enrichment activity and choose to continue its study in depth, become eligible for Level 6 services. Level 6 services are individually tailored to the specific needs of a particular student or small group of students. These services may involve work with a community mentor, individual curricula adaptations such as curriculum compacting, taking special training at another institution, or any combination of provisions to facilitate the student's development.

Examples of activities at Level 6: A student at Emmett O'Brien VTS prepared an audio-visual presentation on meteorology (a topic not covered in the VT school's science curriculum). He presented the data, with explanations, to students in his own school and at a neighboring VT school as a General Exploratory Activity in their program. Under the direction of a Southern Connecticut State University meteorologist, that student later became involved in a hurricane research project.

A student at H.C. Wilcox VTS received a commission from the Director of the Center for Creative Youth, Wesleyan University, to produce an original oil-painting depicting the vocational school experience. The painting is currently on display at H.C. Wilcox VTS, and it will soon be exhibited at other VT schools.

For the past two years, students at H.C. Wilcox, with instruction and mentoring from a New Haven Register Bureau Chief, have published the first VT school newspaper. This is a cooperative venture between Pro-Tech students and Chapter I students.

Level 6 opportunities are limited to no more than 10% of the student population (5% Arts / 5% Trades-Academics). **Involvement at this level constitutes identification of the individual as "gifted or talented"** and makes the full services of the program available to that person.

At this time fewer than 10% of the population served by the Pro-Tech Program have completed advanced projects. As the students gain greater awareness of opportunities open to them, and as they become more confident in their creative abilities, the involvement will increase.

EXAMPLE OF THE PRO-TECH PROGRAM IN ACTION

TYPE I
Scott, a junior at one of the Vocational-Technical high schools, became highly interested in robotics after attending a robotics demonstration presented as an enrichment activity of the PRO-TECH Program by a staff member from the University of Hartford. Scott saw a need for robots which were both practical and inexpensive. The demonstration robots had been neither. Scott discussed his idea with the PRO-TECH Coordinator.

TYPE II
A book, How To Make Computer Controlled Robots, was suggested, but it was too basic for Scott's needs. The program Coordinator then arranged for Scott to visit the engineering Departments at Yale University and Waterbury State Technical College. There he could have access to appropriate sources and individuals. The coordinator also made contacts with engineers at a local electronic manufacturing firm.

TYPE III
As his product, Scott designed a robot which could "function in an uncontrolled environment" by first testing and interpreting its surroundings. Its 6510A microprocessor unit is compatible with the Commodore 64 computer which makes it relatively inexpensive. Scott prepared the schematic drawings and narrative description and forwarded them to the McGraw-Edison engineering competition in California. As an extension of this Type III, Scott is exploring possibilities of constructing a prototype of the robot with the assistance of an engineer-mentor at the electronics firm.

This project was conceived and initiated by Scott, but could not have been completed without the assistance and guidance of the Coordinator and Scott's instructors. It is also clear that such projects probably would not happen without the stimulation and encouragement provided as part of the Pro-Tech Program.

PRO-TECH and the mission of the Voc-Tech Schools

The Pro-Tech Program complements the mission of the Vocational- Technical School System. Specifically, the features of the program enhance vocational education in the following ways:

1. Cooperation and collaboration with business and industry are sought in the planning and development of advanced enrichment experiences;

2. Many of the activities are on the frontiers of trade and science thus awakening students to the opportunities and demands of the 21st century;

3. Students in the program receive advanced instruction in academic subjects and processes such as creative problem solving, effective communication, and leadership which enhances their value to the economy of the state;

4. Students are assisted toward self-actualization by encouraging advanced productivity in their areas of interest and achievement.

The program is also relevant when viewed in the context of the basic objectives of vocational-technical education (Evans, 1971) which are to:

1. Meet the manpower needs of society;

2. Increase the options available to each student; and

3. Serve as a motivating force to enhance all types of learning.

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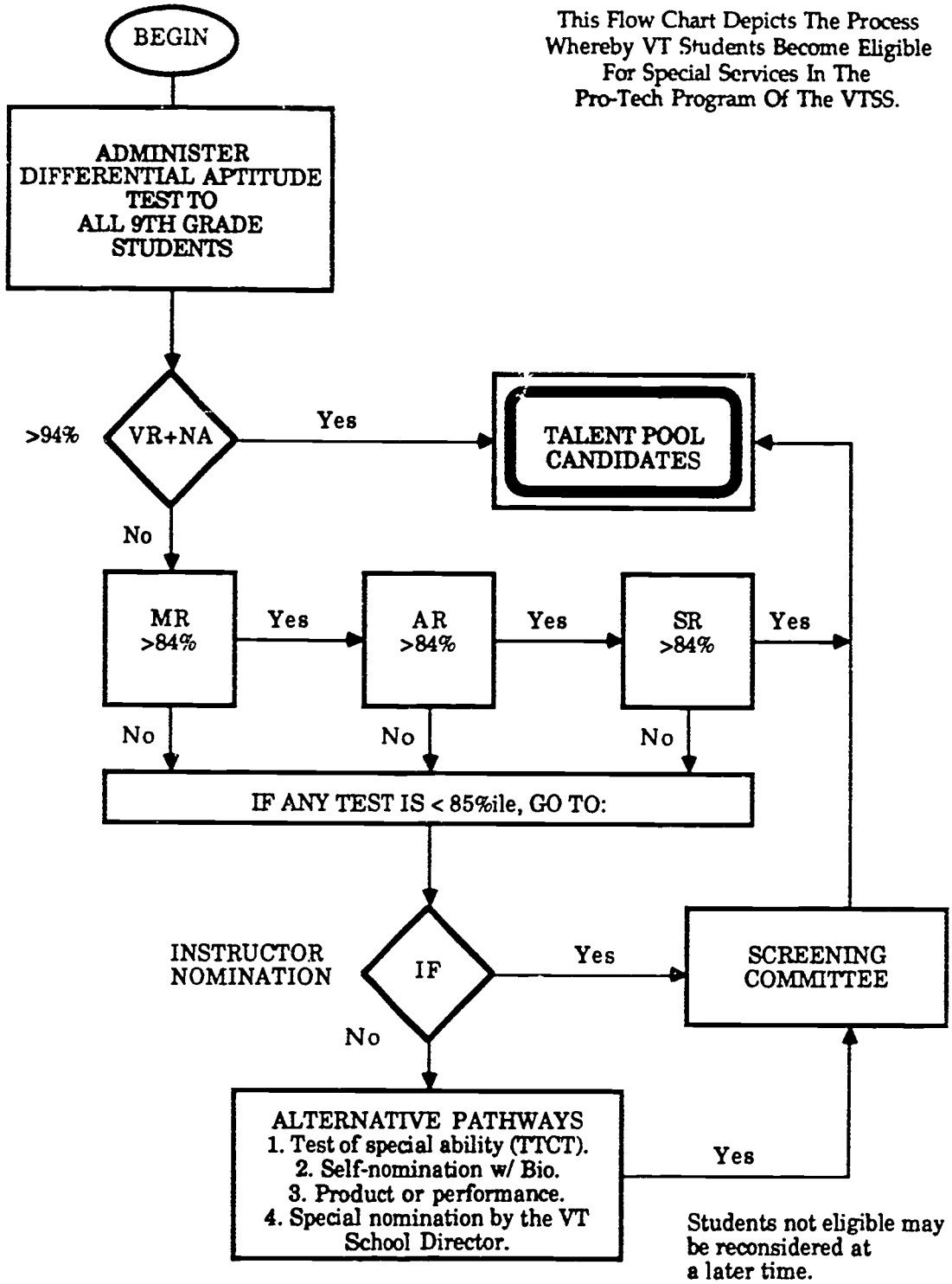
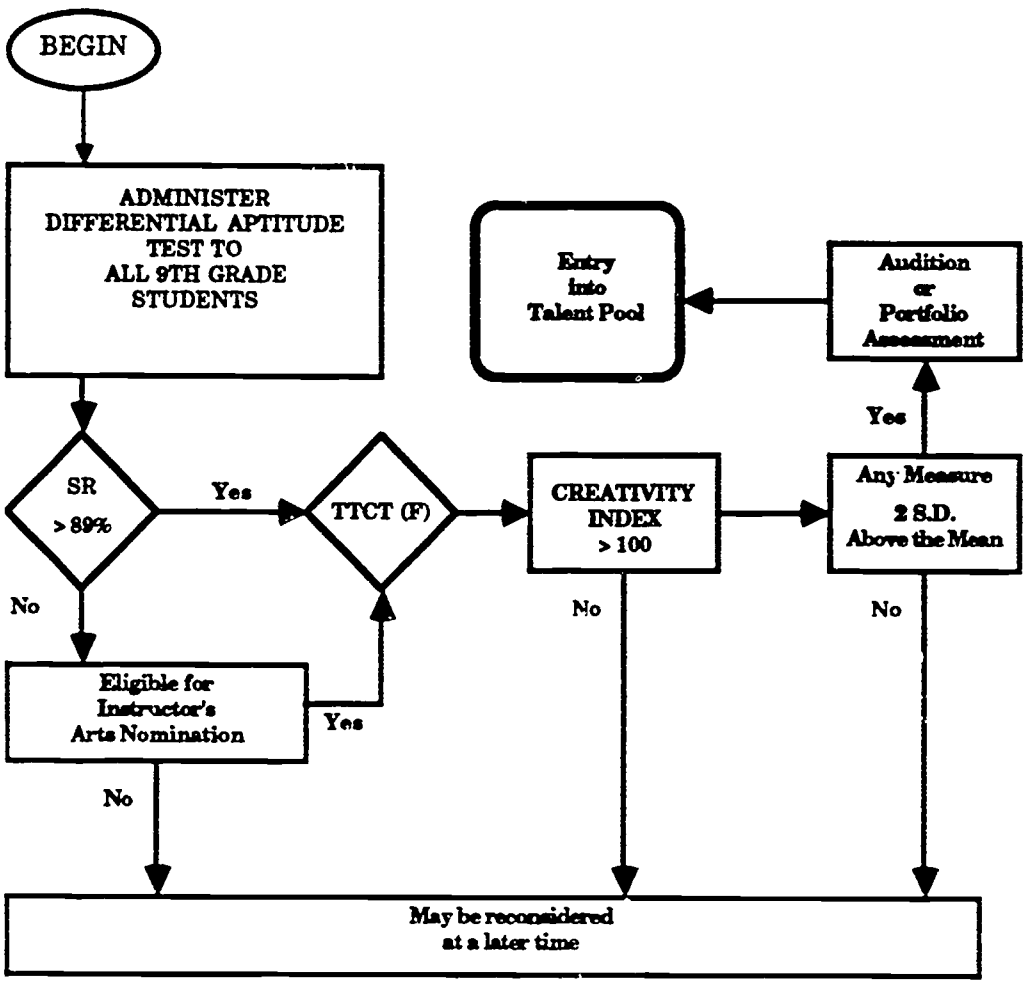
This Flow Chart Depicts The Process Whereby VT Students Become Eligible For Special Services In The Pro-Tech Program Of The VTSS.



NA = Numerical Ability
VR = Verbal Reasoning
AR = Abstract Reasoning
MR = Mechanical Reasoning
SR = Spatial Relations

This Flow-Chart Depicts The Process
Whereby VT Students Become Eligible
For Special Services In The Arts
Component Of The PRO-TECH Program.



TTCT(F) = Torrance Test of Creative Thinking (Figural Form)

SR = Spatial Relations subtest of the Differential Aptitude Test