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What is A.T.T.V. Biology?

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A.T.T.V. Biology (Audio-tutorial Television Biology) is an approach to teaching a subject which is paced by closed circuit educational television. The curriculum material of the course is divided into units of work (modules). Each module consists of one week's classroom activities. For each module there are objectives and learning experiences to be completed within that week. The module suggests the minimal work expected of the student, and the student works directly from the module guide. When the student has completed the minimal learning experiences, he is free to pursue additional activities that are listed in the module. This is where the subject becomes more individualized.

The concept of this program emerged from the endeavors, initiated in December, 1969, by several members of a biology department who wanted to develop a fresh approach to teaching the biological sciences in high school.

A pilot program was developed and attempted during the spring of 1970. Using 16 students the A.T.T.V. program was conducted for 18 weeks. The developers of the program, through feedback from the staff, administrators and students, felt that this program was successful enough to merit further development. A comprehensive proposal submitted to the board of education made it possible to secure funds to continue the program development in the summer of 1970. During the school year 1970-71, A.T.T.V. Biology was implemented at the ninth grade level for approximately 360 students for the entire year.

In 1971, through a grant from the National Science Foundation and assistance from the M.I.T. staff at Cambridge, Massachusetts, the A.T.T.V. curriculum was further modified, and audio tutorial scripts and tapes were produced.

WHY A.T.T.V.? It was felt by the curriculum team that the educational system was not meeting the needs of the greatest number of students. Conventional methods used in lectures, laboratories, recitations and examinations work well for some biology students. However, many staff members felt that there might be a better way to meet the needs of a greater number of students. Many innovations in biology have centered around the curriculum to

be taught, while this program concerned itself with the methods used in instruction.

Learning is a multi-dimensional process; therefore, educational systems should accommodate and cultivate as many modes, paces and styles of learning as possible. This cannot be done effectively by using only conventional means; hence, meeting the individual needs of the greatest number of students is difficult. The curriculum writers felt that to meet students' needs, a more individualized approach must emerge. Upon these premises, and many others, the guidelines for this program were conceived. This model of instruction is now proposed for Iowa high school biology teachers.

PROGRAM STRUCTURE AND DESIGN As has been indicated previously, the A.T.T.V. program is centered around television lessons. Television paces the instruction and provides overviews of a particular segment of study. After television viewing, specific learning material is disseminated in the following facilities:

AUDIO-TUTORIAL SESSION (ATS) The Audio-Tutorial Center is a place where the student pursues a unit of work by using self-instructional material at his study carrel. The basic equipment for each carrel is a tape recorder, ear phones and other materials appropriate for the unit's work.

INDEPENDENT STUDY SESSION (ISS) This is a period of time allotted each student to correlate what has been done in ATS and LAB. It is a time for "pooling" information with some guidance from the instructor.

STUDENT DIAGNOSTIC SESSION (SDS) SDS is a center where testing occurs and prescriptions for remedial work for the student are reviewed cooperatively by the teacher and the student.

LABORATORY SESSION (LAB) This is where the student becomes acquainted with laboratory techniques and research procedures, and, hopefully, attains some proficiency in each.

STUDENT-ORIENTED CLASSROOM (SOC) This is available for *only a few* of the "high calibre" students who submit a proposal for individual study and research and perform this work under the guidance of assigned advisors. When the proposal is approved, the student performs his work in an established area devoid of congestion. The student is paced by television lessons and the individual's pursuit branches from these. Candidates for this program must be screened by a selection committee involved in biology instruction. The selection criteria are based on:

1. Previous academic records in science classes,
2. Two letters of recommendation from former science teachers and counselors,
3. An interview with the biology staff.

GENERAL ASSEMBLY SESSION (GAS) This is held when appropriate for all students. This is a time for enrichment beyond the scope of the classroom. Guest speakers, seminars, field trips and films, are a few of the activities in which the students engage themselves.

THE MECHANICS OF A.T.T.V. BIOLOGY All students will attend all sessions, with the exception of the A.T.T.V.-SOC students, who will work independently. Each student will spend two consecutive periods in each of the A.T.T.V. sessions. This means that the group will stay in the Audio-tutorial Session for two periods, and then move to the Independent Study and Diagnostic Session for two periods. This cycle is then repeated every six school days with the issuance of another module.

<i>Facility</i>	<i>Time</i>
Audio Tutorial Session	2 days
Laboratory Session	2 days
Independent Study Session	1 day
Student Diagnostic Session	1 day
	<hr/>
	6 days

Students meet one day out of every two weeks in the General Assembly Session to listen to a featured speaker, view a film or engage in a group field trip. This facility adds the dimension needed to make for a more comprehensive program for the students. The area can be utilized as a "special" lecture session for students who have completed all prescribed work in the module and want to listen to a special lecture that may or may not have anything to do with the subject matter in the module. Special lectures can deal with such topics as:

1. "The Effects of Science on Technological Development"
2. "Is Man Continuing to Evolve?"

It is recommended that the instructors rotate approximately every 10 weeks, because it will enable each one to observe how the student progresses through each session, thereby allowing for more insight into the total operation of the program.

PROGRAM ARTICULATION The entire program is under direct control of the A.T.T.V. coordinator who is, of course, one member of the teaching staff. The coordinator will work with other A.T.T.V. Biology staff members and the school administration. Early in the school year, the teachers in their respective areas are to designate two student tutors per class. In the selection of these students, several criteria are taken into account, such as, dependability, character and school attendance. The students which are selected will serve in their respective areas the entire school year, unless removed for some academic or disciplinary reason. One student coordinator is appointed to act as a liaison between tutors and staff members. The student coordinator should

be an upperclassman; preferably, one who has taken the course, an advanced biology student or perhaps an advanced independent study student. Basic duties of program personnel are as follows:

Roles of Personnel

<i>Personnel</i>	<i>Roles</i>
Coordinator	<ol style="list-style-type: none">1. Articulate total program2. Conduct staff meetings3. Handle all program publicity4. Meet with other administrative personnel when deemed necessary
Teaching Staff	<ol style="list-style-type: none">1. Assist individual students2. Design the classroom activity, learning center, lab demonstration3. Assist student tutors4. Grade exams and mark modules5. Assist with marking report cards
Tutors	<ol style="list-style-type: none">1. Assist each student, when the need arises2. Conduct examinations and mark them immediately afterward, while the student is present3. Assist with general functions in each session, such as setting up a learning center4. Assist with marking absences5. Meet weekly with the student coordinator
Student Coordinator	<ol style="list-style-type: none">1. Conduct meetings with student staff2. Enter all grades into student files3. Work with the A.T.T.V. coordinator to maintain an information bulletin board, which will announce up-coming special meetings and events.

RECORDS Because of the multi-faceted nature of A.T.T.V. Biology and because the program deals with a large number of students, record keeping is very important. A departmental filing cabinet will not only organize materials and information but will serve as an instrument for effectively articulating the program. The contents of the department file should include such items as:

1. All previous proposals and correspondence with regards to the initial developments of A.T.T.V. Biology
2. All letters of inquiry concerning A.T.T.V. Biology

3. A copy of each student module
4. A copy of the Teachers' Guide
5. All attendance cards

6. A complete file on the progress on each individual student.

Items one through five are considered departmental information; however, this will be determined by the coordinator. With regards to student's records, a complete file is also maintained and the contents of this will include:

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|--------------------|--------------------|--------------------------|
| 1. All quizzes | 2. All tests | 3. A brief autobiography |
| 4. Special reports | 5. Progress sheets | 6. Conference reports |

There are numerous types of forms that will be utilized in the A.T.T.V. program. These include corridor passes, special excuses and library information, and, from time to time, revision of these forms may be necessary because of some local problem. However, the use of some type of form is encouraged in order to enhance effective organization within the program.

STUDENT EVALUATION Needless to say, student evaluation is always a difficult task. It is certain that there is no one method or instrument at present that can be used effectively. Therefore, it is probably appropriate that there be many methods and instruments. Some of the instruments and methods used in A.T.T.V. are:

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|----------------|---------------------------|------------|
| 1. Tests | 2. Quizzes | 3. Modules |
| 4. Conferences | 5. Self Assessment Papers | |

By using these instruments and methods, a comprehensive file is compiled on each student; and this file contains all tests, quizzes, progress charts and conference reports. With these methods, biology teachers can "individualize" their teaching as much as possible.

CONCLUDING REMARKS A.T.T.V. Biology is certainly not the ideal program of instruction, although, it must be kept in mind that the *method* of instruction is a primary concern. The concept of any instructional system is not useful until a distinction between teaching and the transmission of information has been made. The student is an active element in the learning process, not merely a receiver of information. The program which involves the student in the learning process is one in which a favorable response can be seen.

The heart of this A.T.T.V. model stresses the use of many types of media to individualize instruction. A wide variety of media is made available to make learning more interesting and meaningful. In this program students find solutions to problems through the use of programmed materials, carefully chosen, to aid them in the discovery process.