THE USE OF AUDIO VISUAL EQUIPMENT IN TRAINING OF STUDENTS AT SCHOOLS OF EDUCATION AND DESINING AN EFFECTIVE MODEL

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Good Morning! Mr. Chairman, Ladies and Gentlemen. It is indeed a pleasure to be here to address this International Education Symposium. The subject of my paper is the «Use of Audio Visual Equipment in the Training of Students at Schools of Education and Designing an Effective Model».

There is no need to spend time in what has already been said about the role of good quality education needed in Turkey and other countries to support economic and industrial growth. Audio Visual is but one of the many useful tools as an aid in the classroom to speed up and improve the quality of instruction. My paper this morning will not go into the basic Audio Visual aids, such as view graphs, slides, films, cassetts, etc., I am sure everyone is familiar with them and their application.

Instead I would like to present a model or a systematic approach to instruction utilizing Audio Visual which I will call Video Techniques and to briefly mention Computer Based Training and some of the latest tecniques.

The use of Video in the classroom is of course not new, it is has been around in some countries a long time. However, today, equipment is a cheaper for both delivery and production systems allowing for widespread use. I am sure that in the near future we will dee, in almost every school and at all levels, each school with their own production facilities and a video in every classroom.

Of course the use of video in the classroom does not replace the teacher and is not the answer to all instructional deficiencies. We will always need qualified teachers. It does, however, enable the teacher to present material in a more usable form; it helps to standardize the level of instruction an it does enable the teacher to keep up with changes in teaching methodology and technology without extensive retraining.

In this paper I will concentrate in the development of a systematic approach to the teaching and traing of students in scientific and technical subjects wich are found more commonly in Voc Ed, Technical and Engineering schools.

Naturaly there are a variety of models that can be developed, each one for a specific subject area.

The advantage, of course, of the use of video is that real applications can be brought into the classroom so that the student is better prepared to perform a useful function upon completion of a course. Dr Skovholt in his talk yesterday pointed out and stressed the importance of practice for the student in a learning situation. By using video teshniques we bring the student as close as possible to the real world enabling him to put into practice more quickly the material he has learned either in the laboratory or in the outside world. ,

The process I am suggesting for the development of teaching and training programs and to make qualifications determinations is characterized by performance of the following activities, both initially and on continuing basis. I will discuss Analysis, Developing Learning Objectivies, Curriculum Design, Curriculum Development, Evolution, Implementation and Revision.

Let us begin with Analysis. Perform a systematic analysis to determine performance requirements, training needs and prerequisite qualifications for the subject to be thought. This activity consists of :

- Continuing the task analysls to the level of detail at which identified skills and knowledge match the skills and knowledge assumed for the student.

(7) — Verifying identified skills and knowledge.

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● Collecting verification data in accordance with established techniques.

(8) — Using qualified personnel (i.e., subject matter experts, training specialists) to conduct and participate in the performance requirements and needs analysis.

Development Learning Objectivies. Derive from the Task Analysis learning objectivies that describe desired student performance after training. This activity consists of :

(1) — Translating selected tasks and related task information into terminal learning objectivies which describe exactly what the student should have learned or be able to do the conclusion of the course in terms of measurable performance.

(2) — Translating task elements, skills, knowledge, and related information associated with each terminal learning objectivie into enabling learning objectivies.

(3) — Verifying that the skills and knowledge assumed for beginning students in the task analysis are appropiate.

(4) — Using qualified personnel (i.e., subject matter experts and training specialists) to translate the task analysis data into terminal and enabling learning objectivies.

Curriculum Design. Design program curriculum based on specified learning objectivies. All aspects of instruction (eg instructional methods, tests, media, and course management) should be determined systematically using learning objectivies as the primary base for all decisions. This activity consists of :

(1) — Systematically identify and analyzing all performance areas important to the subject.

(2) — Stating performance requirements in terms of tasks.
● Fully describing a task in terms of duties.
● Organizing tasks by duties.
● Describing each task in terms of a distinct unit.

(3) — Collecting all task information required to identify those tasks important to the subject element.

(4) — Verifying all identified tasks and associated task information.

- Collecting verification data in accordance with established techniques and ensuring the task listing is accurate and comprehensive.

(5) — Determing qualification requirements for all tasks determined to be important to the subject element.

(6) — Determing the task elements, knowlege and other information supporting adequate task performance by conducting an analysis of the task selected.

- Determine the necessary steps (task elements) and their sequence, required for the successful performance of each task. fv

- Identify the conditions under which the task (task element) is performed.

- Identify the initiating and terminating cues for task element performance.
  Identifying the skill(s) and type of skill (physical, mental) required in the performance of each task and task element.

- Identify the knowledge necessary to support each identified skill.

(1) — Developing tests for terminal and enabling learning objectivies.

(2) — Giving tests in accordance with program management plan.

(3) — Systematically analyzing test results and providing effective performance feedback to the student.

(4) — Systematically analyzing test results to identify program deficiencies and incorporating corrective program modifications.

Program Implementation. Prepare and implement a program management plan which provides organizing, controlling and evaluating the delivery of instruction to the student. This activity consists of :

(1) — Conducting instruction in accordance with the program management plan.

(2) — Using qualified personnel to conduct the program.

(3) — Establishing teacher performance requirements and technical qualifications to ensure effective instruction.

(4) — Establishing policy and procedures to ensure the availability of personnel with these qualifications to participate in program design, development and conduct.

And lastly, **Program Revision.** Develop and implement a plan for systematic and regularly schedule evaluation of the effectiveness of the program as indicated by the performance of students in the next level or in an actual performance situation. Revision and upgrading of the program should be based on such evaluations and on subject matter content changes or additions. This activity consists of :

(1) — Continually monitoring and evaluating program conduct.

(2) — Collecting graduate performance data.

(1) — Sequencing the learning objectivies.

● Identifying those learning objectivies which must be mastered before certain other learning objectives can be reasonably achieved.

● Identifying those learning objectivies for which, mecause of their similarity, the mastery of one makes mastery of other casier.

● Identifying those learning objectives which can be mastered independently of one another.

● Using these relationships to organize the learning objectivies in a sequence in which they should be mastered.

(2) — Systematically identifying the instructional and testing methods, and media that are available to be used in the course.

● Identifying the instructional method(s) (e.g., lecture, on-the-job training, simulation, selfstudy, team training) and testing methods (e.g., written, oral, performance) based on learning objective performance requirements, instructional requirements (e.g., initial training, retraining and req.irements for trainee/instructor interaction.

● Identifying instructional media based on :

— The type of performance specified by the learning objectives (e.g., use of rule, verbal communication)

— The type of learning required (e.g., mental skill physical skill.

— Instructional media characteristics required to support the type of performance and the type of learning (e.g., initating cues associated with a specific learning objective may require dynamic visual presentation for effective mastery learning; a medium such as video tape may be selected to satisfy this requirement).

Curriculum Development. Develop the program material required to support the learning objectivies. This included preparation of standardized teacher lesson plans, classroom visual aids (equipment), student test material, etc., This activity consists of :

(1) — Organizing the instructional Content.

● For initial instruction based on learning objective sequence.

● Providing for rehearsal.

● Organizing instructional content into parts (i.e., modules, segments, phases, lessons) in accordance with the selected instructional methods and media.

(2) — Preparing program intructional media.

● Lesson plans and supporting instructional information.

● Evolution of the capacity of existing instructural media (lesson plans, students test, and visuals) to support achievement of specific learning objectives.

● Developing new instructional media as required to support the training program design using established methods.

Evaluation. Develop appropriate tests from learning objectives according to the performance standards and evaluation criteria delineated. Tests should appropiately require demonstration of knowledge and/or skills outlined in the learning objectives and should specify necessary procedures and guidelines for administering tests to maximize consistency and relevance. This activity consists of :

(3) — Evaluating deficiencies identified in program conduct, graduate performance, or resulting from changes in external factors.

This briefly describes a systematic approach to development of teaching or training program utilizing video based techniques.

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The next logical extension of Audio Visual in education is what is commonly known as Computer Based Interactive Instructions, (or Computer Aided Instruction or Computer managed instruction) wich uses an interactive video system. This is an area which requires a good deal more time to cover than time allows. It involves the use of the integrated environment approach. These systems have the advantage of providing individualized instruction, simulation of the real world; it allows students to practice skills learned elsewhere and learn by experimentation. It provides for computerized managed student progress throughout training, throughout periodic measurement of student performance.

The integrated Environment approach employs such methods as instructional psychology subject matter analysis, needs assesment, evaluation analysis, etc., to produce mainline courses, validated instructional strategies, effective learner control strategies, and simplified authoring systems which when all combined with hardware such as color displays of text and graphies, video presentations and a minicomputer, results in a cost effective delivery system capable of providing instruction to hundreds of users simultaneously.

Such systems are at present extremely expensive and find application today only in higly sophiticated environments which can support the costs involved. The learning attributes of such systems are significant :

● Active participation
● Adaptive to learner needs, individualized instruction.
● Self-paced
● Feedback

There are two authoring alternatives :

(1) — Computer language.
● Design as needed
● Fewer compromises
● Requires programmer
● Slow Reduction
(2) — Authoring System
● Present design
● Adapt to templates

- No programmer
- Quicker

Some estimates of current applications show a 50% utilization in Industrial applications, 25% in Military applications and the remaining 25% divided between Education, Point of Sale and Data Based Publication.

Costs of current systems vary considerably depending on application and equipment used. Typical systems can vary from 50-100,000 dollars up to one million dollars.

The cost elements include

- System hardware

  — Authoring station
  — Student station

- Software authoring development
- Production
- Material and supplies
- Management

The ratio production time to output product time varies as well as the cost. Typical-500 total hours to produce 45 minutes of material, with about 50% of the time being devoted to planning and scripting.

As one can see, Computer Based/Interactive Video Instruction is costly and is not meant for low budget applications.

Thank you for your attention.

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