

# Evaluation: The Key To Selecting Quality Microcomputer Courseware for School Media Collections

Barbara B. Bland

*What do school media coordinators do when principals announce the availability of funds to be spent quickly for computer courseware?*

The Materials Review and Evaluation Center has the answer—select programs from THE ADVISORY LISTS OF COMPUTER COURSEWARE. Since 1970 the Center, a section in the Division of Educational Media, Department of Public Instruction, has developed and distributed annotated bibliographies of noteworthy books, films, multi-media kits, videocassettes, and numerous other types of media to supplement the state adopted textbooks. For the last two years, the Center has also been evaluating and informing schools about quality computer courseware: diskettes, cassettes, modules, and auxiliary materials.

Because media personnel are responsible for coordinating the selection and acquisition of all materials for the school media collection, they are now being called upon to provide leadership in selecting computer courseware. As schools incorporate microcomputers into the instructional program, media coordinators need assistance in ascertaining that the courseware they purchase is instructional in nature and not merely electronic workbooks, toys, or games designed primarily for entertainment. School media coordinators and Media Advisory Committees will find it difficult to keep abreast of the overwhelming amount of information about this new instructional medium.

*Why is it important for media personnel to be knowledgeable about microcomputers and courseware?*

Media coordinators organize and make accessible to students and teachers all other media formats in the schools' collections and, logically, will have the same responsibility for these new formats. Microcomputers and accompanying courseware are not passing fads. Properly used, they are effective learning devices capable of generating learner enthusiasm while simultaneously permitting significantly more individualization of instruction; however, as instructional tools, computers are only as effective as the courseware they accommodate. The Center's staff recommends that school personnel move slowly when planning to purchase courseware. As with anything new in education, entrepreneurs have flooded the market with new materials ranging from exciting and outstanding to deplorably bad and inaccurate.

Originally, Department of Public Instruction reviewers were recommending less than 30% of the courseware previewed. Producers and their representatives are now being more selective in what they submit for evaluation and the percentage has recently increased to approximately 45%.

*How do media coordinators verify that computer courseware selected for their schools is among the best available?*

Even when it is impossible to preview computer programs before purchases, there are ways by which responsible educators can make the best use of a limited microcomputer courseware budget. The Materials Review and Evaluation Center offers concrete help through the Advisory Lists, other related bibliographies, maintaining an examination collection of numerous computer programs for firsthand examination, and providing workshops on the selection and use of courseware. The Center's staff has contacted over 600 producers of instructional courseware and invited them to submit their products to the Center for review and evaluation. Those programs submitted are available in the Center for examination by educators interested in hands-on experience prior to purchase.

The descriptive annotations in the *Advisory Lists of Computer Courseware* give essential information for selecting appropriate computer programs for instructional purposes. Annotations cite equipment required, program components, prices, producer's names and addresses. The evaluations consider the courseware's strengths and weaknesses as related to curricular areas. Programs listed have been thoroughly evaluated by at least two Department of Public Instruction consultants in an attempt to provide accurate information about all aspects of meaningful and useful annotations.

The professional staff of the Materials Center also conducts orientation sessions for first-time microcomputer users and more comprehensive staff development workshops for selected groups of educators. These workshops focus on techniques and procedures for evaluating various types of instructional computer courseware, including programs for Computer Assisted Instruction and Computer Managed Instruction. Staff members familiar with the appropriate programs and hardware supervise workshop participants as they learn to identify strengths and weaknesses of courseware by actually running programs. Consultants conducting these sessions emphasize courseware as any other instructional media to insure a balanced collection.

*What are some desirable characteristics of quality courseware?*

The Center's staff stresses the importance of identifying and selecting computer programs that are educationally sound and that take full advantage of the computer's capabilities. They also insist that previewers ascertain that all instructional computer courseware exhibit appropriate production characteristics regardless of the intended audience. They point out the importance of distinct and understandable graphics as well as instructions and responses compatible with the content's academic level and the user's maturity. They identify

programs in which the sound augments understanding rather than distracts the user. The Center's staff points out that user responses should elicit positive, reinforcing feedback, and that incorrect answers should not prompt elaborate, flashy responses. Moreover, students should receive tutorial assistance in arriving at desired answers in contrast to lessons which simply provide the correct answer after one or two errors.

The Center's staff works cooperatively with the Instructional Computing Coordinator who provides consultant services regarding computer hardware. With the Instructional Computing Project's microcomputer laboratory now housed in the Center, visitors and workshop participants can freely run any of the large number of computer programs on hand, using the microcomputers listed on state contract. For visitors primarily interested in purchasing courseware, trained staff members are always available not only for technical assistance, but also for assistance in interpreting program documentation and judging the overall quality of specific programs. As the Center is open year round, educators regularly avail themselves of the opportunity to visit on their own time as well as on staff workdays.

*What sources other than the Advisory Lists are available to help media coordinators make wise selections?*

One of the simplest yet most effective ways for school media coordinators and other educators to learn about a wide variety of available computer programs is to read the relevant journals. Several of these periodicals contain reviews of courseware and suggestions for working with microcomputers. Unfortunately, not all commercially published reviews are totally reliable. With regular reading, educators can soon evaluate the quality of the reviews and judge for themselves which magazines they deem reliable for critical, unbiased information. Some producers' courseware is previewed in more than one journal, making comparisons of editorial standards and biases possible. The Center subscribes to several reputable journals and displays them for examination.

The Center also provides a carefully selected collection of books providing general information about microcomputers and books focusing on educational applications of computers. Visitors to the Center can also examine filmstrips, videocassettes, and sixteen millimeter films related to microcomputers. By examining these additional materials, media coordinators can develop a solid core of media for a school's professional collection. The Center's staff is also available to assist media coordinators in developing guidelines for organizing computer courseware in the school media collection and, thereby, making it readily accessible to users.

*What are the criteria by which educators should judge microcomputer courseware?*

The Center's staff has developed procedures and criteria for evaluating instructional courseware. These appear at the end of this article. Department of Public Instruction consultants use these criteria when writing comprehensive

evaluative critiques for the Center's bibliographies. However, other educators could use these same criteria to create a rating scale, for example, one to five, or a checklist by which to rank the suitability of courseware when written critiques are not essential.

The Center has acquired some data management programs and is developing criteria identifying those programs most suitable for school administrative management purposes. The staff will distribute an annotated list of these programs in the near future, including programs designed to manage attendance, budget, class scheduling, and other recordkeeping data. Management programs vary greatly in terms of complexity and costs. In most instances reviewers must input sample data and create a simulation before judging the effectiveness of these programs. For this reason, potential users are well advised to schedule sufficient time to thoroughly examine programs in the Center.

The Materials Review and Evaluation Center frequently sponsors demonstrations of new programs, especially those which require training or preparation for successful use. Consultants from the Department of Public Instruction, school personnel, and other interested educators are invited to these sessions. Such meetings encourage an exchange of ideas between users and producers in terms of the users' needs and the programs' characteristics. If an educator is interested in a program which has not been submitted to the Department of Public Instruction for evaluation, the staff will contact the producer and request a preview copy or a demonstration if appropriate.

Items listed on the *Advisory Lists of Computer Courseware* have been thoroughly evaluated by educators who weigh overall instructional value as well as appropriateness for use in the K-12 curriculum. Reviews of materials not listed on the Advisory Lists are often available in the Center, either in commercially published reviews or in the Center's files of items deemed inappropriate for schools to purchase.

All of the Center's services related to microcomputers are designed to facilitate effective selection and use of computer courseware in the educational process. Media coordinators and other educators are invited to take full advantage of all the Center's services and resources.

The Center is open from 8:00 a.m. to 5:00 p.m. Monday through Friday. Groups may schedule visits by calling (919) 733-3929.

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## Appendix

### Evaluating Instructional Computer Courseware

#### Procedures For The Evaluator

- Review the criteria by which the courseware will be judged
- Read/examine any documentation/manuals accompanying the disk(s)/cassette(s)
- Identify the specific goals of the program as stated in the guide
- Ascertain that all components (disk(s) and/or cassette(s) and accompanying literature) are available for examination
- Make sure that the disk(s)/cassette(s) and equipment are compatible
- Run the program as directed in the manual
- Judge the courseware by the criteria listed below

#### Criteria Characterizing Noteworthy Courseware

##### General

- Follows educationally sound principles of instruction
- Uses the computer's capabilities advantageously
- Provides for ease of interaction between user, computer and program
- Provides sufficient information for user to solve a problem, reach a conclusion, grasp a concept, learn a skill or process

##### Documentation (support materials)

- States all objectives clearly
- Suggests characteristics of user, e.g., gifted
- Specifies expected results in behavioral terms
- Provides or suggests follow-up or related activities
- Includes pertinent information (for contact) about the producer/author for convenience of user if program won't run

##### Documentation (validation/field testing)

- Gives place, conditions, of field testing
- Identifies target group
- Cites variables and controls
- Specifies results of pretests and posttests

##### Mode/Technique

###### Tutorial

- Bears full task of instruction, incorporating user responses
- Presents initial, basic instruction to teach a skill, concept, process
- Assumes that user has minimal prior instruction in program's contents
- Presents information, directions, processes in clear, sequential steps

###### Drill and Practice

- Identifies prerequisite skills, information through pretest or in documentation
- Reinforces skills previously taught
- Varies exercises, generating data randomly to avoid user boredom or memorization
- Branches to easier or more difficult tasks, based upon user's responses
- Concentrates on skills previously taught
- Provides explanation of process being drilled if correct response is not given within a specified number of tries

###### Simulation

- Replicates vital aspect of original situation, process, etc.
- Provides for sufficient user involvement to make experience meaningful
- Requires a variety of tasks, e.g., making judgments, solving problems
- Presents activities too difficult, dangerous, expensive, or inconvenient for user to experience firsthand



### *Problem Solving*

- Provides for problem solving experience which goes beyond either simple or typical word problem application
- Requires the user to apply accepted principles or rules to determine responses
- Provides the user an opportunity to create or analyze variations of the problem based on change of user input or projected program data, thus playing "What if ...?"
- Includes an explanation or graphic illustration of the resultant situation from the responses made in solving the problem
- Develops an appreciation for and an understanding of algorithmic methods

### *Games (Educational)*

- Emphasizes instructional value over game format
- Requires mastery of specific skills to participate
- Correlates skill level and game complexity
- Is fun to play

### *Instructional Management*

- Facilitates management of instruction by collecting, storing, and retrieving pertinent data for
  - Maintaining student and class records
  - Assessing test scores
  - Diagnosing student responses/progress
  - Prescribing initial or follow-up instruction
  - Monitoring time for responses
- Permits alteration of program when necessary to meet user's needs

### *Content*

#### *Scope*

- Presents subject in manageable segments even though comprehensive in coverage
- Is adaptable as introduction or summary of topic

#### *Accuracy*

- Presents error free information about topic
- Employs appropriate grammar, spelling, sentence structure, etc.
- Gives correct instruction for proper use

#### *Treatment*

- Is free of bias
- Is authoritative
- Is logical, thorough, objective
- Is factual rather than judgmental

#### *Appropriateness*

- Uses concepts relevant to user's experience/frame of reference
- Relates to K-12 curricula

### *Production/Presentation*

#### *Ease of Use*

- Incorporates instructions in the program itself (and presents as needed on the screen)
- Requires responses compatible with user's experience, knowledge
- Allows for user control except in timed or testing mode
- Gives directions appropriate to lowest level of use

#### *Accessibility*

- Permits user determination of the sequence of activities to be performed
- Permits user to access the program at any desired point, repeating or omitting any part
- Permits escape from the program before completing entire exercise

#### *Pace*

- If timed, is geared to maturity, capability of user
- Can be adjusted

#### Clarity

- Gives instructions for user in understandable, concise terms
- Provides instructions compatible with difficulty of activity to be performed
- Presents directions sequentially to insure correct use of program
- Requires minimum number of references to ancillary materials other than manual

#### Display

- Projects images of appropriate size and clarity for ability, maturity of user
- Permits easy viewing, reading of images and characters

#### Personalization

- Responds to user's performance with encouragement and reassurance
- Avoids inane quips and degrading responses
- Elicits correct responses, helps eliminate errors
- Motivates user to perform successfully

#### Special Features

##### Graphics

- Uses images other than print to enhance, clarify content, text
- Employs special effects economically/efficiently

##### Sound

- Increases user's understanding of projected material
- Reinforces user's response

##### Color

- Augments the content
- Uses effective shading in black-and-white programs

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