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ABSTRACT

The Computerized Observation System (COS) is a software program which an observer can use with a portable microcomputer to document preservice and inservice teacher performance. Specific observable behavior such as appropriate questions and responses shown to increase student achievement are recorded as Low Inference Observation Measures. Time on task for student and teacher are also Low Inference Measures. The High Inference Rating Scale component of the COS measures a broad spectrum of teacher behavior currently used in teacher evaluation including enthusiasm, clarity, pacing, organization, oral communication, assessment, lesson objectives, behavior management, positive learning climate, and instructional methods. The Narrative Component is provided to record any pertinent information about the observation or setting that may be necessary for data collection, documentation, or recordkeeping purposes. The IBM convertible microcomputer was used for a field test of the program during the winter term of 1987, which was conducted with nine inservice teachers enrolled at Valdosta (Georgia) State College School of Education in a practicum on teaching students with behavior disorders. Discussions of the advantages and disadvantages of the IBM convertible and preliminary results of the field test conclude the report. Three references and lists of the goals of the school of education, the observer, and the teacher are included. (MES)

Computerized Observation System (COS) for Field Experiences

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Computerized Observation System (COS) Components

The Computerized Observation System (COS) is a software program accompanied by documentation that addresses the evaluation of various aspects of field experiences and student teaching. The COS is primarily designed for use with preservice teachers in field experiences or preservice teachers in student teaching. It may also be used to observe experienced teachers involved in practicum experiences at the graduate level.

Pulldown Menus

Each component of the COS is accessed through pulldown menus. After the observer performs an observational task such as counting discrete behaviors or writing suggestions to the teacher, he or she is returned to the pulldown menu for further action. This type of control over the COS program allows the observer an easy method of moving from one component to another.

Class Roll

Each time the COS program is started, the observer is requested to select the teacher to be observed. Since most observations of teachers in a higher education setting are receiving course credit for their practice teaching, the COS program provides a module which allows the recording of all teachers, preservice or inservice, enrolled in a specific course, along with the type of practicum setting, the grade level of the students, the school where the practicum is occurring, and the city where that school is located. Once this information is typed into the computer, it is saved on diskette so that the observer only needs to type the information once. After the teacher to be observed is selected from the class list, the observer can select from the three basic components of the COS; the Low-Inference Observation Meesure, the High-Inference Rating Scale, or the Narrative Component.

Low-Inference Observation Measure

The teaching behaviors identified in the Low-Inference Observation Measure are meant to provide teachers with concentrated practice in providing students with quality instruction. A description of the low-inference teacher behaviors is presented using current research findings and practical examples. Specific observable behaviors that have been shown to increase student achievement are singled out, so as to give teachers the opportunity to master these important behaviors. The low-inference teacher behaviors include:

- Associates new learning with PREREQUISITE learning.
- States appropriate GOALS of instruction.
- Provides appropriate SMALL STEPS of instruction.
- Asks clear appropriate QUESTIONS.
- Provides appropriate FEEDBACK to CORRECT student responses.
- Provides appropriate FEEDBACK to INCORRECT student responses.
- Provides for OVERLEARNING.

Student and Teacher On Task Behavior

Two other low-inference behaviors measured by the COS are teacher on task and student on task . Their measurement differs from the previous behaviors in that the observer has the option to choose measurement of teacher on task, student on task, or both teacher on task and student on task. The observer also chooses the time interval for monitoring one or both of the behaviors. For example if the observer chose teacher on task and 30 seconds, the computer would ask "Is the teacher on task?" every 30 seconds and delay the observation program until the question was answered. The resulting observation measure would compare the number of times the teacher was on task, in the judgement of the observer, with the number of times the question was asked during the observation period.

High-Inference Rating Scale

The High-Inference Rating Scale component of the COS measures a broad spectrum of teaching behaviors currently used to evaluate teachers. They are included to address areas of teacher evaluation not covered by the Low-Inference Observation Measure and to allow each observer using the COS to individualize the program. The observer accomplishes this by focusing on the high-inference behaviors that relate directly to practicum objectives and perceived teacher needs while deleting unnecessary behaviors from the scale. The observer can then communicate the chosen behaviors to the teacher prior to the first observation. This allows the teacher to concentrate on those behaviors germane to their program and individual needs. The teacher being observed has the opportunity to express their opinion as to whether or not they were capable of their best performance within the limited observation period by rating themselves on the same scale used by the observer. The high-inference teacher behaviors currently being evaluated include:

- Enthusiasm
- Clarity
- Pacing
- Organization
- Oral Communication
- Assessment
- Lesson Objectives
- Behavior Management
- Positive Learning Climate
- Instructional Methods

Narrative Component

The Narrative Component of the COS is provided to record any pertinent information about the observation or setting that may be necessary for data collection, documentation, or record keeping purposes. Possibilities include social economic status of the school, comments on the feedback given the teacher, or any unusual circumstances of the observation such as a fire drill in the middle of an observational period. The Narrative Component may also be used to elaborate on observation results, reteach course objectives or to provide suggestions for improvement to the teacher.

Program Features

The Computerized Observation System (COS) has a number of features which assist the observer in accurately recording the instructional lessons. These features include the extensive use of help screens to clarify portions of the program and efficient use of the microcomputer's timing mechanisms.

Help Screens

Throughout the program, the observer can request clarification of specific program commands by typing the Function key "F1." The screen clears and information concerning the questions the observer may have is presented. After the observer reads the information, he or she is returned to the program. The use of the help screens allows observers to begin using the program with minimum difficulty. It also eliminates the reliance on printed documentation.

Timing

The MS-DOS portable microcomputers use an internal clock to record the date and time. The Computerized Observation System uses this feature in the low-inference component to record actual observation time. Each time the observer requests assistance from the help screen or desires to view the current status of the observation, time is suspended until the observer returns to record low-inference teacher behaviors. The observer can also leave the low-inference component and use either the high-inference or narrative component with the observed time in the low-inference section continuing only when the observer returns to that section. By counting the observed time only when the observer actually has the opportunity to record a low-inference teaching behavior, the results of those observations with observers less familiar with the COS can be compared with those using the system more frequently. Additionally, comparisons are enhanced because various frequencies of teacher behaviors can be transformed to incidents per minute so that the length of observation periods can vary and the frequency of behaviors still be compared.

Data management

The results of each observation are saved into a low-inference and high inference data file. With the low-inference file, demographic information stored includes the teacher's student number, the date of the observation, the subject of the lesson taught, the size of the class, the number of minority and special education students, and the size of the instructional group. In addition, the frequency of each teaching behavior, the frequency of correct and incorrect student responses at three minute intervals, the total time that the observer was recording behaviors during the lesson, and student and teacher time on task are stored for each lesson observed. To date, approximately 20 observations are being added to the low-inference data file each week.

The high inference data file contains the teacher's student number, the date, and the rating of each high inference behavior rated by the observer and the teacher. The observer may elect to complete the rating scale any time during or after an observation.

FIELD USE

Hardware

The IBM convertible microcomputer was selected for field testing the Computerized Observation System (COS). Other MS-DOS portables will also run the COS software program, including Zenith's models 171 and 181 as well as Toshiba's T1100 and T1100 Plus.

Additions to the convertible's basic unit included memory expansion from 256K to 512K, a parallel/serial adaptor, and a printer. The parallel/serial adaptor provides access to most printers and to telecommunications devices. The class list, results of the low-inference observation, high-inference rating scale evaluations, and narrative comments can be printed by connecting the convertible to a printer or using the printer specifically designed for the convertible. The data files have been stored as text (or ASCII) files so that the observer can use other database or statistical software packages to analyze the results of the observations. In addition, the program diskette contains several files which contain the control statements for the Statistical Package for the Social Sciences - version X (SPSSX). By uploading the observation data and the control file to a mainframe computer using SPSSX, various data analyses can be performed to investigate the relationships among observed variables.

RAM disk

The memory expansion allows for the creation of a RAM disk. A RAM disk emulates a disk drive with disk access then directed to the RAM disk. The COS program can be copied into the RAM disk's memory along with pertinent data files using a batch file. By setting up this copy routine prior to the observation period, all disk access during the observed lessons will be to the RAM disk, thus eliminating any disk drive noise. At the completion of the observation period, when disk drive noise would not be distracting, the observer can transfer the collected data to the data diskette.

Advantages and Disadvantages of the IBM Convertible

One disadvantage of the new MS-DOS portables, except for Zenith's model 171, is the use of 3 1/2 inch diskettes instead of the common 5 1/4 inch diskette. Users of the various MS-DOS portables have indicated the difficulty of transferring files from the portable so that they could use the information on the various IBM and IBM compatible desktop models. While some users have installed a 3 1/2 inch disk drive into their desktop model, another possibility is using a software package, such as Brooklyn Bridge. This package allows rapid transfer of files through the serial ports of two microcomputers. This software package can help eliminate the disadvantage of different size storage media at minimal cost.

Another disadvantage of the IBM convertible microcomputer is the display screen. IBM's LCD screen has been rated low in readability when compared to Zenith's or Toshiba's backlighted LCD screens (Unger, 1987). While poorly rated, the difficulty of viewing the convertible's LCD screen can be considered a benefit in the classroom when observing teachers, because only the observer is able to view the screen clearly.

Current status

During the Winter term, 1987, the Computerized Observation System (COS) has been field tested with nine inservice teachers enrolled in a practicum for teaching students with behavior disorders as well as with one student teacher in a classroom setting serving the mildly handicapped. All practicum teachers were provided with a draft of the teacher documentation at the beginning of the term and individual meetings were arranged so that the teacher behaviors to be observed were clarified.

Statistical analyses

During the first stage of the field testing, two objectives have been identified that require statistical analysis and focus on the technical aspects of the observation system. These objectives include:

(1) identifying the most efficient method of presenting the results of the low-inference component after an observation period,

One method of displaying a teacher's performance is a profile analysis as described by Gibney and Wiersma (1986). The frequency of each teaching behavior can be compared with other performances of that teacher or compared with similar teachers at the same or different levels of training using an area transformation as recommended by Medley, Coker and Soar (1984). These authors suggest that in comparing observational data that frequencies be converted to percentiles and then to standard scores. Additionally, in accurately conveying the teacher's performance, they caution the use of a normal distribution with some frequency scores which may not occur in each observation period. With these suggestions affecting the data analysis, the presentation of results in the form of bar charts, line graphs, or numeric tables will be evaluated as to each form's clarity in communicating the teacher's performance.

(2) determining the consistency of the measurements over the term.

Medley, Coker, and Soar (1984) offer valuable suggestions in evaluating items in the performance measure. In developing and refining scoring keys which provide teachers with the results of their performance, the authors indicate that a factor analysis of the low-inference items will assist in identifying how to best combine items to convey results. As the number of observations increase, such analyses will be possible and scoring keys which provide the most accurate and useful observational data will be evaluated.

The primary focus of the observations has been the counting of the behaviors outlined in the low-inference component of the COS. All observations to date have been collected by one individual, the faculty member responsible for the supervision of the practicum experiences.

Two objectives of the Winter term field testing include: (1) having the program run smoothly,

A major objective of the COS is for the program to allow any interested faculty member or other observer to use the program with minimal time invested in learning the system and yet having the data collected be reliable. To accomplish this objective, all menu selections need to be understandable and if that isn't possible, the observer can access help screens that clarify any selection. Also, the observer should have the flexibility to move between program components easily. For example, if the observer is recording the frequency of teacher behaviors in the low-inference component and wants to write several suggestions to the teacher, the program allows the observer to leave the low-inference section, select the narrative component, write the suggestions, and return to the low-inference measure and continue recording the occurrence of behaviors. For a second example, if another student enters the instructional group, the observer can change the instructional group size and again continue the observation session.

(2) measure student's distractions to the computer-based observation system.

A concern of both the teacher and the observer in using a microcomputer to record teacher performance is its distracting effect on students. To see the teacher performing optimally, it would be unfair if students were continually focusing their attention on the observer and microcomputer. Although acceptance of the portable computer in the classroom has been positive, the recorded impressions of the observer and teachers being observed will provide documentation as to the effects of the intrusion of the portable microcomputer in the classroom environment.

Computerized Observation System Goals

School of Education Goals

1- standard comparison measure for program evaluation and development
2- documentation for NCATE field experience standard
3- evaluation tool for course objectives
4- research data base available to faculty through networking of departments

Observer Goals

1- record observation data efficiently, document feedback, and organize record keeping
2- create a data base of teacher performance for comparison
3- improve feedback to teachers in the field by making it immediate, more complete, less threatening, and concrete
4- increase student opportunity to learn by emphasizing increasing time spent in academic activities
5- document teacher growth within individual practicum experiences and throughout professional programs
6- provide a standard of performance for teacher skill acquisition
7- emphasis sequence of events in instruction

Teacher Goals

1- provides preparation for professional teacher evaluation measures
2- provides specific goals and objectives for instruction
3- emphasises mastery of basic teaching skills
4- individualizes according to perceived needs
5- allows for teacher input and self evaluation
6- allows for comparisons with different standards of performance, for example, preservice teachers, student teachers, and post graduate teachers

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