

INSTRUCTIONAL PSYCHOLOGY FOR SCHOOL COUNSELLORS

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Abstract

This paper describes a systems approach to instructional psychology which can be used by school counsellors as a basis for diagnosis and remediation in the classroom. The interrelationships of the four components of a basic teaching model are emphasized. Selected aspects of each component, which are important for effective instruction, are discussed.

Résumé

Cet article décrit une approche de systèmes pour la psychologie d'instruction que les conseillers peuvent utiliser comme fondement au diagnostique et aux démarches utilisées dans la salle de classe. On souligne les rapports entre les quatre composantes d'un modèle fondamental d'enseignement. Enfin, on étudie certains aspects de chaque composante, aspects qui sont importants pour assurer un enseignement efficace.

An assumption of this paper is that there are school counsellors at large who don't know as much instructional psychology as they should. Perhaps, the reason for this is the understandable preoccupation of counselling programmes with affective, interpersonal and psychometric concerns. Although most, if not all, programmes involve exposure to basic learning courses, which presumably include instructional psychology, the mental set of the counselling trainee is usually slanted in a clinical direction at the time of taking such a course. The relevance of instructional psychology is sometimes obscured by romantic fantasies of the Florence Nightingale type. The writer has spoken to enough practising school counsellors to believe that once in the field they become aware of the importance of a sound knowledge of instructional psychology. This is especially so when they find themselves in the position of attempting to remediate instructional problems of students and teachers.

The situation described above is essentially one of timing the presentation of instructional knowledge to the counsellors for optimal relevance. This paper is an attempt to provide a basic conceptual framework from which counsellors and teachers can understand instruction. Such an understanding is suggested as a prerequisite for effective diagnosis and remediation of instructional problems. It is presumed that some practising counsellors and teachers may be more aware of the relevance of the points raised following attempts to solve instructional problems than when they were being trained.

A SYSTEMS APPROACH TO INSTRUCTION

It has been the writer's experience that most teachers appreciate the need for at least some sort of rudimentary planning before teaching a lesson, however, fewer understand the teaching-learning situation as a collection of interrelated components which can function in much the same way as the components of a machine. Many teachers are aware of the major components of a teaching-learning situation, in isolation, but do not understand their interdependence. This lack of understanding can lead to considerable frustration when trying to locate what went wrong during a lesson. Robert Pirsig (1974) in his celebrated book "*Zen and the Art of Motorcycle Maintenance*", discusses this type of problem at length. He compares two approaches to motorcycle maintenance. One is based upon careful planning for travel, in terms of tools and spare parts likely to be needed for maintenance. This is done by the owner who has familiarized himself thoroughly with the components of his machine and their interrelationships. When things go awry such an owner begins a systematic analysis in order to locate the cause of the problem and make the necessary repairs. This can be described as the classical analytical approach to motorcycle maintenance.

The alternative (adopted by Pirsig's travelling companions) is an emotionally based resistance to attempting to come to terms with such complicated technology as motorcycles. Pirsig's friends felt that such technology was beyond their understanding and preferred to rely upon the

uncertainties of maintenance performed by paid "professionals", or desperate but purposeless attempts to make repairs themselves when a service outlet was not available. It obviously was not a matter of these friends being incapable of learning how their cycles functioned and how to diagnose and locate sources of trouble. It was more a matter of feeling threatened by something which seemed too complicated for laymen or so technical as to be dehumanizing.

The structured or systems approach to instruction attempts to develop an understanding of the teaching-learning situation in terms of its components in a way analogous to that described by Pirsig. The aim is to demystify the teaching-learning process so that when things don't work out, as planned, there is a way of systematically considering and eliminating possible causes of the problem. It is not necessary to assume that such an approach to instruction overlooks the gestalt dictum that the whole is more than the sum of its parts. Certainly, in a teaching-learning situation there are interactive processes at work which produce phenomena (especially of the affective kind) which are difficult to identify. Such charismatic variables will always be a factor in human interactions. Nevertheless, there appear to be a number of basic components in any teaching-learning situation which can be readily identified and regulated. It is the contention of this paper that such an approach to instruction provides an understanding which will be valuable to most (journeyman) teachers. While philosophically acknowledging the limitations of a reductionistic approach to understanding human behavior, The writer wishes to suggest that it is nevertheless a useful way of approaching instruction. For the teacher who encounters learning/behavior problems (and we all do) a systems approach offers a way of conceptualizing the teaching-learning situation which provides opportunities for locating possible causes of the problems and then making *testable adjustments* until the problem is relieved or solved. Not all, but many classroom difficulties can be approached in this way.

GLASER'S BASIC TEACHING MODEL

The following basic components can be identified in any teaching-learning situation: (1) the presentation of the to-be-learned material, (2) a response from the learner which provides evidence of appropriate learning, and (3) a consequence to the learner's response in the form of confirmation or correction (cf. Becker, Engelmann & Thomas, 1971). From this broad overview it can be readily seen that instruction concerns itself essentially with the way in which the teacher (1) organizes and presents the material to be learned, (2) takes account of factors within the student which will

affect learning and, (3) handles the assessment of learning outcomes and the provision of reinforcement and remediation.

A useful way of conceptualizing the interdependence of these concerns is the basic teaching model of Glaser (1962) as shown in figure 1. Many teachers and counsellors are familiar with this model; however, some of its major features are often overlooked. At first glance the appearance of boxes suggests rigidity. However, the *feedback loops* are a crucial aspect of the model which point to the interdependence of its components and its ultimate flexibility. If the assessment of terminal performance is below that stated in the initial objective a number of possibilities can be checked out and the appropriate changes made. For example, was the objective unrealistic? Were there entering behaviors which were overlooked? (e.g., some students had a poor teacher in Chemistry 101) Were teaching procedures adequate? (e.g., programming of material, motivational devices, teaching style, etc.) Was the test reliable and valid? Regardless of how adequate or inadequate a particular lesson is, with a systems approach to instruction, usable data which provides the basis for remedial action is almost invariably obtained.

The attempt so far has been to provide a rationalization for the use of systems approach to instruction. What follows is a more detailed discussion of the application of Glaser's model to the classroom. Within the confines of this paper the discussion will be limited to those aspects and components of a teaching-learning situation which in the author's experience have caused considerable difficulty in the classroom.

INSTRUCTIONAL OBJECTIVES

Most teachers pay at least lip service to the need for objectives but fuzzy objectives still abound (Mager, 1962). It is still not unusual to find students who are waiting for the final examination before reaching a conclusion as to what the objectives were for a course. Indeed, many courses could be dubbed "Mystery 101". The behavioral objectives movement, largely under influence of Mager, has highlighted the vagueness and subjectivity of many instructional objectives. Reasonable advice is to look upon an objective as a statement of what the learner will be able to do as evidence of having achieved the stated objective. The focal point of any objective is the verb. In general terms, the aim should be to specify as precisely as possible what is expected of the student. This assumes that the teacher is clearly aware of what is wanted in terms of student response. Many teachers find the attempt to formulate precise objectives makes them painfully aware of the inadequacy of their teaching. However, the effort to sharpen objectives can pay

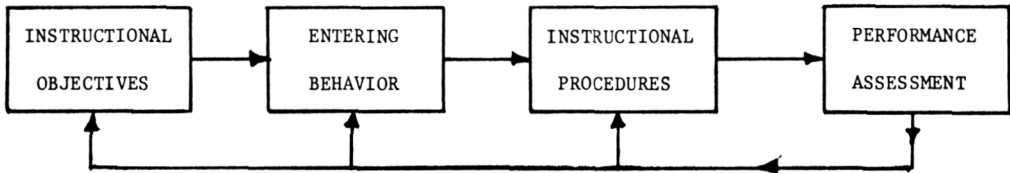


Figure 1. Glaser's basic teaching model.

dividends in terms of more effective teaching-learning (cf. Duchastel & Merrill, 1973).

ENTERING BEHAVIOR

Failure to adequately assess entering behavior can also cause a breakdown of instruction. An often overlooked factor is the attitude of the learner to the instructional objective. Student negativity obviously demands some ingenuity in terms of motivational techniques. Subject areas such as mathematics or grammar have to be taught particularly well and supported by the liberal use of extrinsic reinforcement to compensate for their usual low level of intrinsic interest for many students. Some teachers prefer not to be aware of the attitude of their students because they are not prepared to make modifications. The rationale of assigning primary responsibility for learning to the student rather than to the teacher for teaching, is not going to avoid the ultimate empirical consequence of students experiencing difficulties and not performing as well as they could. This can intensify their negativity towards the subject concerned.

The student's level of performance in areas that are prerequisites for successful attainment of the current instructional objective can be assessed formally through revision type tests or questionnaires or informally through oral questioning and classroom discussion. Several days or even weeks spent on bringing entering behavior up to desired levels is ultimately a good investment of teaching time. The current curriculum fashion of providing a minimum of structure for teachers makes the question of entering behavior critical. For example, the curriculum guide for grade nine grammar may consist of one word—"grammar". How is the grade ten English teacher to know what his students have done if they have come from several grade nine classes? The temptation is to assume that because students have all had a certain course that they are all performing at or above the same basic level of competence. The lack of curriculum structure within the schools and diversity of student competence it promotes is currently under question.

The assessment of entering behavior can result in major changes in initial instructional objectives as well as provide data upon which to cater for individual differences in ability and achievement

levels. The failure to properly assess entering behavior might be analogous to embarking on a motorcycle journey without regard to the state of tune of the cycle, its suitability for the terrain or the type of fuel it needs. Assessment of entering behavior is a critical factor in formulating instructional objectives and the planning of the instructional techniques to achieve them. For example, a wide range of student entering behavior relative to the initial instructional objective may lead to the following: (1) formulation of several objectives for different ability/performance groups, (2) the use of advanced students to act as helpers or group leaders, (3) the equitable distribution of performance levels in any class groups or (4) the use of programmed materials which cater for individual differences in rates of progress. Another related aspect is the provision of cushion activities for those who may complete assigned work early, such as more advanced work, reading material, and self-selected activities which are not disruptive. A close look at entering behavior also provides a basis for predicting the extent of possible remediation and gives the teacher a chance to be prepared rather than experience the frustration of trying to teach an objective which is inappropriate for some students.

INSTRUCTIONAL PROCEDURES

Selected aspects of the third component in Glaser's model (instructional procedures) will be discussed on the basis of there being common problem areas of instruction. Before learning can take place the student must be attending to the teacher or the to-be-learned material. Attention signals can be given in several ways such as spoken commands, gestures, handclaps, throat-clearing, bells, door slams, etc. The teacher must take advantage of the reflexive response of students to a sudden change in environmental stimulation, by seizing the moment of silence following the signal to capture student attention. This simple procedure is often overlooked by teachers who start "teaching" in a sea of inattention. However, this can be all right if, in fact, the commencement of instruction functions as an attention signal.

Attention signals also need to be given throughout instruction when the teacher perceives inattention. Eye contact, changes in voice volume,

speaking at another pace, gestures or verbal commands are some of the common techniques.

An attentive student is one who is aroused. The optimum level of arousal (general level of cortical activity) is a moderate one between sleep and high excitement (Hebb, 1955). Teachers can predict fairly well from measures of entering behavior and previous teaching experiences how arousing or interesting the to-be-learned material may be. Material that has a high level of intrinsic interest for students requires a minimum of externally induced motivation from the teacher. However, there are to-be-learned materials that have little or no intrinsic interest for most students such as initial basic language skills which involve rote learning e.g., spelling and reading. In these cases or with other "dull" subjects there is an obvious need for external motivational techniques such as verbal praise and attention from the teacher, games (e.g., spelling bees), variability of student and teacher activity and activity reinforcers contingent upon a performance criterion (Becker, Engelmann & Thomas, 1971).

A crucial aspect of motivation in the learning process is the provision of reinforcement. Many teachers have difficulty in understanding the "law of effect" namely, that we do those things more often which are followed by consequences we perceive as desirable than those which are followed by consequences we perceive as undesirable. Just as many people have emotional difficulty in accepting an analytic approach to instruction, many have emotional difficulty in accepting the mechanical hedonism underlying most human behavior. Rather than agonizing over the philosophical implications of the "law of effect" one needs only to systematically observe one's own behavior to realize that it is a common phenomenon. Even the non-behavioristic Eastern psychologies recognizes this phenomenon (e.g., Buddhism, Gurdjieffian ideas, cf. Tart, 1975) as the origin of human misery and offer ways of transcending this general law but obviously acknowledge its existence.

If most human behavior is a function of the "law of effect" it is foolish to ignore its role in the classroom. Paradoxically, it is the reinforcement of an awareness of the law that can lead to its possible transcendence, although in theoretical terms such a transcendence is impossible to establish because of the manichaeian character of the "law of effect" — it is impossible to find an example of adult human behavior where reinforcement can be eliminated as a possible factor.

Ours is a society which tends to ignore "appropriate" behavior while being preoccupied with the apprehension and punishment of anti-social behavior. Classroom teachers often reflect this bias in their preoccupation with punishment. Some find themselves almost gagging on their

words as they attempt to verbally reinforce desirable student behavior. However, a counsellor who can encourage teachers to persist with reinforcement in spite of his unfamiliarity, may be ultimately assisted by observable improvements in student performance. Teachers need to be reinforced by counsellors for reinforcing students.

Before leaving reinforcement it is necessary to point out that its effective use requires considerable knowledge and experience which is unlikely to be gained by taking a course or reading books alone. There is a constant need to engage in remedial analysis of behavioral situations in order to determine why "reinforcers" sometimes do not work (Becker, et al., 1971). This is an area where input from a third party who is not directly involved in the classroom, such as the school counsellor, can be helpful. A common example of the naive misuse of reinforcement is the teacher who wishes to express goodwill towards the students by indiscriminately showering them with "reinforcement" regardless of their behavior. This non contingent reinforcement often has the opposite effect to that intended (Becker, et al., 1971).

School counsellors who have the prerequisite knowledge and experience with reinforcement can function as coaches if accepted by classroom teachers. When on-the-spot expertise in reinforcement is scarce, videorecording of classroom sessions allows later analysis by an expert and subsequent consultation with the teacher concerned. Classroom teachers may benefit from viewing their own tapes alone. However, it is unlikely that they would have the skill required to perform a functional behavioral analysis and develop proposed modifications.

Another key aspect of instructional techniques to commonly cause classroom problems is question technique. Few teachers are aware upon entering a classroom of the implications of open-ended questions (questions directed to the class in general). If the teacher has taught the students to wait for a "do it" signal from the teacher before the designated student answers the question, things go smoothly. However, the absence of a "do it" signal may result in several students answering simultaneously to produce chaos or perhaps no answers at all.

The ongoing process of question and answer is a key way in which student performance is assessed informally as well as a means of maintaining attention. A suggested questioning technique is for the teacher to inform students of a general procedure for answering such as raising hands and waiting for a "do it" signal such as a nod, pointing to or naming the student. It is crucial that the teacher not accept answers which break the rule otherwise its formulation is useless.

It is preferable for the teacher to ask the

question, pause for students to develop an answer and indicate their willingness to respond. Hand raising provides an informal measure of student involvement and a basis for subsequent direct questioning of those who appear to be uninvolved. The practice of naming students to answer the question before it is presented often leads to inattention from the remainder of the class. Asking the question, pausing then nominating the respondent is a better way of maintaining attention. Although procedural rules for question and answer may seem to inhibit spontaneity at first, students usually adapt quickly. The avoidance of verbal pandemonium is generally a superior atmosphere for effective instruction.

School counsellors or teaching colleagues can observe classroom teachers in order to deliver feedback on question technique. The use of video and audio tapes as well as devices such as headsets can be useful. This is an area where the interested teacher can probably modify his own behavior through use of technology without being so reliant on the expertise of others, provided that he follows a few simple suggestions such as those listed above.

The teaching of concepts is central to most subjects, however, few teachers seem to appreciate the difficulty and the corresponding importance of some key aspects of concept learning. Most of us implicitly assume that the associations suggested to us by a word are shared by others. Simple questioning reveals the invalidity of this assumption. For example, ask a number of people what the word "man" means. Definitions usually depend upon the subjective orientation of the individual. Let us take the example of the geography teacher who proposes to teach the concept "valley". How does he define this term so that the student can distinguish it from gully, gorge, ravine, canyon, gulch, etc? Resort to the dictionary will not help except to make one aware of the circularity of associations implicit in our language. A similar problem exists for the concepts of hill and mountain. When does a hill become a mountain? Given the difficulty of defining many of the concepts we commonly use it is not surprising that students often have difficulty in making appropriate distinctions. Good teaching can be greatly facilitated by teachers who analyze concepts to be taught (cf. Becker, Engelmann & Thomas, 1975) by listing their unique attributes, common attributes and irrelevancies. The careful selection of examples and non-examples should be designed to enable students to move from obvious differences to the more subtle discriminations. It is the working through of practice examples and not-examples that constitutes the backbone of concept learning. The formulation of a verbal rule or definition may be presented deductively at the beginning of the

lesson or abstracted from the students during presentation of the discrimination tasks. Teachers who make an attempt to concisely define the concepts to be learned and prepare examples and not-examples understand firsthand the difficulty facing their students and usually teach more effectively. A detailed account of how to perform such a concept analysis is available elsewhere (Becker, et al., 1975). Counsellors would do well to direct teachers' attention to the importance of pre-lesson concept analysis and subsequent presentation of examples and not-examples.

Another common problem of concept learning is the failure of teachers to relate the concept to-be-learned to some overall concept hierarchy. New concepts are sometimes presented almost in an conceptual vacuum so that relationships with subordinate and superordinate concepts are not apparent. For example, a student may have learned the concepts exemplified in a manual of chemistry experiments but not perceive superordinate concepts which subsume a particular group of experiments. Teachers sometimes assume that the students abstract these conceptual relationships for themselves. Good teaching involves the clear articulation of subordinate and superordinate conceptual relationships to make the learning of one element in the larger conceptual hierarchy more meaningful. Careful questioning of students can reveal whether this has happened. Sometimes teachers are surprised by the failure of their students to demonstrate an understanding of conceptual relationships on a course examination. However, it may be a case of these relationships not having been taught.

PERFORMANCE ASSESSMENT

The Final Component of the Basic Teaching Model (Performance Assessment) can be an aversive experience for students if it functions only as a terminal labelling device to be used at the end of the course. To be of instructional value performance assessment must be a continually occurring component of instruction. As a basis for feedback, as confirmation of correct learning or remediation, it must occur during and not at the end of the course. Counsellors may be able to help teachers and students perceive performance assessment as a way of monitoring the effectiveness of both teaching and learning. Assessment may, as mentioned earlier, be informal or formal. Questions and observations of students' behavior can often provide a wealth of information about student performance. To use assessment in this way however, involves abandoning its use as a punitive instrument of teacher power — a policy that would be a threat to teachers who rely upon this function. The countless individuals who have been traumatized by the punitive use of assessment procedures often overlook its instruc-

tional value as a feedback mechanism upon which to base remediation. Some of these who are presently parents and teachers overreact to the point of eschewing all assessment. The development of a balanced attitude towards performance assessment as a key part of instruction is a task which school counsellors can pursue with teachers, students and parents.

Perhaps the best way to examine assessment procedures is to compare them to the stated lesson or course objectives. One should be able to tell what a lesson or course is about by looking at assessment procedures. If this is not the case then assessment is invalid. The interdependence of instructional objectives and assessment is obvious at this point. How can one validly assess performance if one has no clear idea of what the course or lesson is supposed to be about? For example, what does the recitation of several verses from a poem studied in class have to do with "developing an appreciation of narrative poems"? It can be seen that poor assessment is often the result of vague objectives. Until one determines what student behavior constitutes evidence of appreciating narrative poems, one cannot adequately assess performance.

The attempt has been to emphasize the interdependence of the components of instruction as viewed from a systems approach. The implicit assumption of such an approach is that it provides

a conceptual and practical basis for remediation of instructional problems. Some of the key aspects of the four components of Glaser's basic teaching model were discussed as a basis for teacher self-improvement and remedial collaboration for instructional purposes between teachers and school counsellors.

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