

INSTRUCTIONAL COUNSELLING FOR COGNITIVE COMPETENCE

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Abstract

Competence is the ability to engage the thoughts, actions, and motivation necessary to accomplish goals. Cognitive competence refers to the internal structure of information and internal processes for transforming this information that underlie displays of competence. Contemporary ideas from cognitive science are employed to develop a general model of cognitive competence. Counselling is defined as a prescriptive, instructional activity concerned with assisting clients to acquire levels of cognitive competence that will allow them to achieve their goals. The instructional counselling approach developed by Martin and Hiebert (1982, in press) is used to demonstrate how counselling can impact various elements comprising the cognitive competence of clients in relation to their concerns and problems.

Résumé

La compétence est la capacité de mobiliser les pensées, les actions et la motivation nécessaires pour réaliser les objectifs. La compétence cognitive réfère à la structure interne d'information de même qu'aux processus internes sous-jacents à la mise en oeuvre de cette compétence. Le modèle général de compétence cognitive présenté dans cet article s'inspire des données récentes de la science de la cognition. Par ailleurs, le counselling est entendu comme une activité prescriptive et d'enseignement qui vise à aider les clients à acquérir la compétence cognitive qui leur permette d'atteindre leurs buts. Cette approche du counselling mise au point par Martin et Hiebert (1982, sous presse) sert à démontrer de quelle façon une relation d'aide peut, entre autre, influencer la compétence cognitive des clients en rapport avec leurs préoccupations et leurs problèmes.

Counselling is concerned with helping people to change. To date, the activities of counsellors have been guided largely by psychological theories of personality, development, and learning. Recently, two fields

of study have emerged which, I believe, will have profound effects on the ways in which counselling is conceptualized and conducted in the future. These two fields are *cognitive science* and *instructional science*. The former area is concerned with the study of the processes and structures that underlie people's abilities to perform (Bransford, 1979). The latter is concerned with the design of conditions of learning that foster the development of these processes and structures (Glaser, 1978).

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Insofar as counselling is concerned with helping people to change, it must be concerned with identifying the processes and structures that underlie effective living and coping in a wide variety of life circumstances, and with the design and arrangement of conditions under which such processes and structures can be acquired.

The central purpose of this paper is to develop a conceptual framework for viewing counselling practice that incorporates contemporary understandings from cognitive and instructional science with respect to human information processing and the acquisition of cognitive competence. In some ways, most contemporary approaches to counselling practice attempt to increase clients' abilities to process information in flexible and personally functional ways. However, such attempts typically have been formulated in the absence of a detailed analysis of the exact processes and structures thought to constitute the human cognitive systems. By advancing our understanding of these systems and how to affect them, current work in cognitive and instructional science may assist counsellors to develop more precise and powerful means of assisting clients to acquire levels of cognitive competence necessary for resolving and/or coping with their problems. It is my hope that this paper may function as a very modest "spur" to such a complex undertaking.

In the first part of the paper, counselling is considered as an activity concerned with the development of cognitive competence. Key concepts associated with this view are defined and elaborated. The second part of the paper is devoted to an explanation of the nature of the cognitive competence that underlies effective performance and coping in a variety of life situations. In this section, models are developed that attempt to explain the structures and processes that comprise human information processing systems, and the content and functions of cognitive structures are examined in relation to the notion of cognitive competence. The third part of the paper is devoted to a description of an instructional approach that might be used to facilitate the acquisition and development of cognitive competence in clients. In this section, the instructional counselling model developed initially by Martin and Hiebert (1982, in press) is elaborated and analysed as a possible vehicle that counselors might use to assist clients to acquire cognitive competence relevant to the attainment of their goals and objectives in counselling. In the concluding section of

the paper, central arguments are summarized, and a general implication of these arguments for counselling practice, theory, and research is drawn.

Counselling as the Creation of Cognitive Competence

Goal attainment is perhaps the most prevalent motive of human beings. When people expect or desire a state of affairs different from that which exists currently, they typically engage in activities designed to bridge the perceived gap between what is and what is desired or expected. *Competence* is the ability to engage the thoughts, actions, and motivation (knowledge, skills, and attitudes) necessary to accomplish one's ends. Over time, and with experience, people acquire greater and greater levels of competence in methods of goal attainment that are applicable to their life situations and circumstances. The information required for the enactment of competence is extracted from one's experiences, differentiated from and integrated with other information available to the individual, and stored for future use. The internal structure of information and internal processes for transforming this information, both of which underlie displays of competence, may be referred to as *cognitive competence*.

In recent years, cognitive competence has been the subject of a great deal of attention from both cognitive and instructional scientists. Much of this attention has taken the form of studying the nature of the cognitive competence possessed by experts in various areas of human functioning, especially in contrast to the cognitive competence possessed by novices in these same areas (Chase & Simon, 1973; Chi, Glaser, & Rees, 1982; Leinhardt, 1983). The findings from such studies have, together with other experimental results and theories of human information processing, furnished a basis for attempts at designing conditions under which cognitive competence similar to that possessed by experts may be fostered in those less expert (Glaser, 1978, 1982). Such work has shown that the goal of fostering cognitive competence is a useful and fruitful goal for prescriptive activities such as instruction.

Counselling, given its aim of facilitating desired human change, is a prescriptive enterprise. Many theorists have noted the essentially instructional nature of counselling (Carkhuff & Berenson, 1976; Ellis, 1977; Katz & Ivey,

1977; Krumboltz & Thoresen, 1976; Martin & Hiebert, 1982, in press; Sorenson, 1967). If the instructional character of counselling is recognized, the relevance, for counsellors and counselling, of instructional theorizing and research on the acquisition and facilitation of cognitive competence becomes clear. As a prescriptive, instructional activity, counselling is concerned with assisting clients to acquire levels of cognitive competence that will allow them to achieve their goals. Stated another way, counselling may be viewed as an activity that assists clients to move from states of incompetence in relation to problems and concerns, to states of competence in relation to these same issues.

Aspects of competence, and of the competence underlying it, may be problem-specific (applicable only to certain categories of concerns) or generalizable. For counselling, aspects of competence that permit clients to resolve their own concerns and problems across a wide range of life situations and circumstances are of particular importance. In facilitating competence, counsellors minimally attempt to assist clients to acquire problem-specific competence. In most cases, counsellors also are interested in helping

Information in memory, particularly in permanent or long-term memory, can be pictured as a complex network of nodes and linkages among these nodes. Each node represents a basic unit of information representing a category. Such informational units are referred to as *concepts*. Concepts are defined by a set of critical features that themselves are concepts, resulting in a hierarchical, embedded network of information categories, or nodes. "Concepts may be concrete (a ruler),

The Nature of Cognitive Competence

Most models of cognitive functioning recognize four major systems: 1) a *sensory system* or gateway through which information from the environment enters the cognitive system, 2) a *memory system* where information is stored temporarily (in working or short-term memory) or permanently (in permanent or long-term memory), 3) a *processing system* where information is manipulated by cognitive processes, and 4) a *response system* or temporary storage area where processed information is held briefly before it is translated into neural messages for motor action (Bower, 1975; Martin, 1984; Winne, 1983).

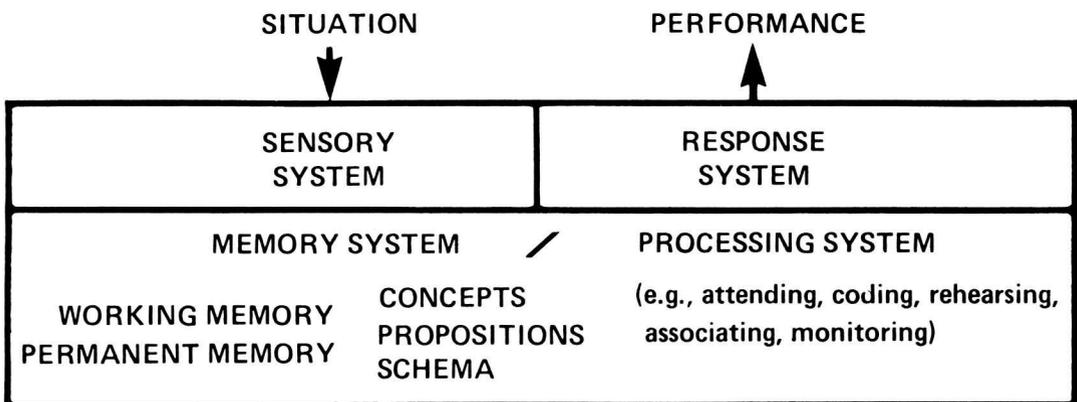


Figure 1. A general model of cognition functioning (from Martin, 1984).

clients acquire more generalizable forms of competence that they might employ in areas other than those of immediate concern. In what follows, cognitive competence is conceptualized as a system of structures and processes that mediates between a problem situation and a client's responses to that situation. For the purposes of this discussion, a problem is considered to arise from a difference between a current and a desired state.

abstract (energy), static (the number 2), dynamic (revolving), and even procedural (solving equations)" (Winne, 1983, p. 9). *Propositions* are relational links joining two or more concepts. " 'All cats are mammals,' 'When he gets angry, she goes away,' 'I was lucky to do so well,' 'I hate puzzles,' and 'Two and one make three,' all count as verbal expressions of propositions" (Martin, in press). *Schemata* are collections of propositions organized into prototypic forms of knowledge.

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Schemata provide large organizational structures for representing information, and specify the kinds of information required to "fill-in" or instantiate the schemata in relation to given situations or sets of circumstances. A *plan* is a very important type of schema for the purposes of this paper. A plan consists of a set of sequenced cognitive operations that we apply to information in order to complete a task (Winne, 1983).

concepts and propositions, declarative knowledge also takes the form of schemata or plans. It is these plans that are used extensively by people when guiding actions in pursuit of goals. In counselling, cognitive-behaviourally oriented theorists long have advocated teaching clients generalizable plans that may be employed to make decisions, solve problems, cope with stress, and manage self-change. Other methods, such as transactional analysis and Adlerian approaches to counselling, also have stressed the importance of developing detailed plans to guide action.

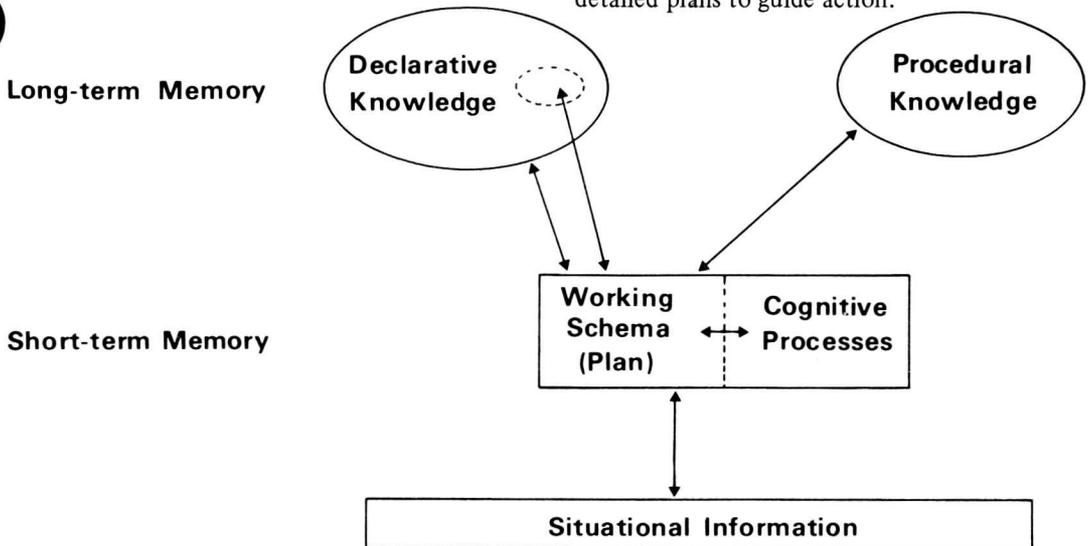


Figure 2. A general model of cognitive competence.

The cognitive structures and processes that constitute cognitive competence in relation to individual goals and tasks may be conceptualized with the aid of a cognitive model developed by Martin (in press). This model focuses attention on the nature of the interactions among long-term memory, short-term memory, and situational information that we thought to occur when people execute plans of action motivated by goal attainment. As such, the model is essentially a model of cognitive competence (see Figure 2).

Long-term memory is divided into declarative and procedural knowledge stores. Declarative knowledge tends to be information that can be communicated verbally (Anderson, 1980). Its presence is shown by the ability of a person to declare or state something (Gagné, 1984). The general knowledge that we possess about ourselves and our world (e.g., "Elephants are big," "I like chocolate cookies," "The force of an object is the product of its mass and its acceleration") tends to be contained in declarative knowledge stores. In addition to

Procedural knowledge may be distinguished from declarative knowledge by attending to the distinction between *knowing that* versus *knowing how* (Anderson, 1980). While the former kind of knowledge is declarative, the latter is procedural. Procedural knowledge comprises the intellectual or cognitive skills we possess. It refers to the ability to perform various intellectual procedures that permit us to do such things as ride a bicycle or speak our native language. Procedural knowledge, unlike declarative knowledge usually cannot be verbalized. (It is interesting to note that much procedural knowledge was at one time declarative, but has been transformed to procedural knowledge as it has become automatic and has lost its ability to be recalled verbally. For example, when learning to type, one's actions at the typewriter often are guided by a series of verbal rules that consciously link hand actions to the layout of the keyboard. Eventually, however, if we become expert typists, the associations between our hands and the keyboard become automatic and we lose our

ability to describe verbally our actions at the keyboard.) Taken together, declarative and procedural knowledge stores comprise most of what is thought to be contained in our long-term or permanent memories.

Short-term or working memory is the portion of our total memory that is active at any given moment in relation to the activities in which we are engaged. In the general model of cognitive competence presented in Figure 2, short-term memory acts as a kind of informational workbench, pulling information from declarative and procedural knowledge stores and from the environment. This information is required to "fill-in" or instantiate a primary working schema or plan that has itself been pulled from long-term declarative stores to provide executive guidance for the completion of an immediate task. As information is brought into short-term memory to instantiate the plan, it is operated on by a variety of cognitive processes whose actions also are coordinated by the plan in short-term memory. In addition to operating on information in short-term memory, these processes also are used to move information among the various structures represented in Figures 1 and 2.

Discovering the exact nature and number of cognitive processes is one of the major concerns of contemporary cognitive science. Nonetheless, a few such processes are generally accepted by most theorists in this area. *Attending* to information in permanent memory activates that information, automatically transferring it to working memory. *Coding* information transforms information in the sensory system into a form manipulable by the cognitive system as a whole. *Associating* information creates propositions by linking previously isolated concepts. *Rehearsing* information keeps information active in working memory and assists its transfer to permanent memory. *Monitoring* information helps determine the match between a prototype or schema for information and information currently available in working memory. Different models of cognitive functioning also propose a wide variety of additional cognitive processes.

An example should help to clarify the operation of the model represented in Figure 2. Let us suppose that, as a result of counselling, a previously-anxious client has learned to

recognize the onset of her anxiety attacks, to engage a well-developed relaxation response in light of this early recognition of incipient anxiety, and to go on to dispute the irrational bases for her anxiety with rational self-talk. Taken together, the steps in this strategy constitute a working schema or plan that the client has learned and stored in her long-term memory. When information from her current situation is encoded as anxiety, she now is able to pull this schema or plan into her working memory and engage various cognitive processes to "flesh out" the plan with relevant and necessary information from her declarative knowledge (e.g., information about rational versus irrational thinking) and procedural knowledge stores (e.g., the cognitive skills that make an effective, automatic relaxation response possible). At the same time, she also is able to monitor relevant features of her current situation for changes that might warrant continuation or termination of her anxiety-coping plan or schema. When this schema is no longer needed it is returned to her long-term memory and other plans and schemata are engaged to cope with demands of future tasks. In this example, the acquisition of an effective anxiety-coping schema as a result of counselling, has resulted in enhanced cognitive and overt competence in relation to the client's goal of being able to manage her anxiety.

Cognitive competence is the possession of cognitive processes and structures necessary to complete tasks basic to the accomplishment of personal goals. As displayed in Figure 2, such competence typically involves a complex interplay between an individual's memory structures and cognitive processes, and situational information.

Before turning to a consideration of an instructional approach that might be used to facilitate the acquisition and development of cognitive competence in clients, a general schema or plan that may be used by individuals to engage in a process of self-change or self-instruction is described briefly. While many schemata or plans are specific to the particular situations, problems, and characteristics of individual clients, some schemata are sufficiently flexible and "open" that they may be useful as sources of executive guidance across a wide range of clients, problems, and situations. This is not to avoid the difficult task of assisting clients to develop individually-tailored plans or schemata. The creative, individual nature of cognitive functioning makes such a pursuit untenable. Rather, the

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purpose in describing an open-ended plan of self-change or self-instruction is to provide counsellors and their clients with a flexible framework that can help them to understand the general nature of the cognitive competence they are attempting to attain through counselling.

One of the main goals of most systems of counselling is to assist clients to manage their own affairs, or ultimately to act as their own counsellors (Carkhuff & Berensen, 1976; Martin & Hiebert, 1982, in press). As a prescriptive instructional activity, counselling may be said to be concerned with teaching clients effective means of self-instruction. Consequently, clients' acquisition of the cognitive competence required for effective

basic phases of self-instruction detailed by Martin (1984) can serve to provide an overview of self-instructional competence (see Figure 3).

The phases in the schema in Figure 3 are indicated by circular "nodes," and possibilities for interaction among these nodes are indicated by the various arrows or "links" in the Figure. A primary operational sequence of the schema begins with the phase of goal setting and proceeds successively through phases of creating information structures, preassessing, mapping task domains and objectives, planning, maintaining action, and evaluating. Within this primary sequence, many other interactions among the phases are hypothesized to occur as the various executive tasks subsumed by each of the phase nodes are refined, elaborated,

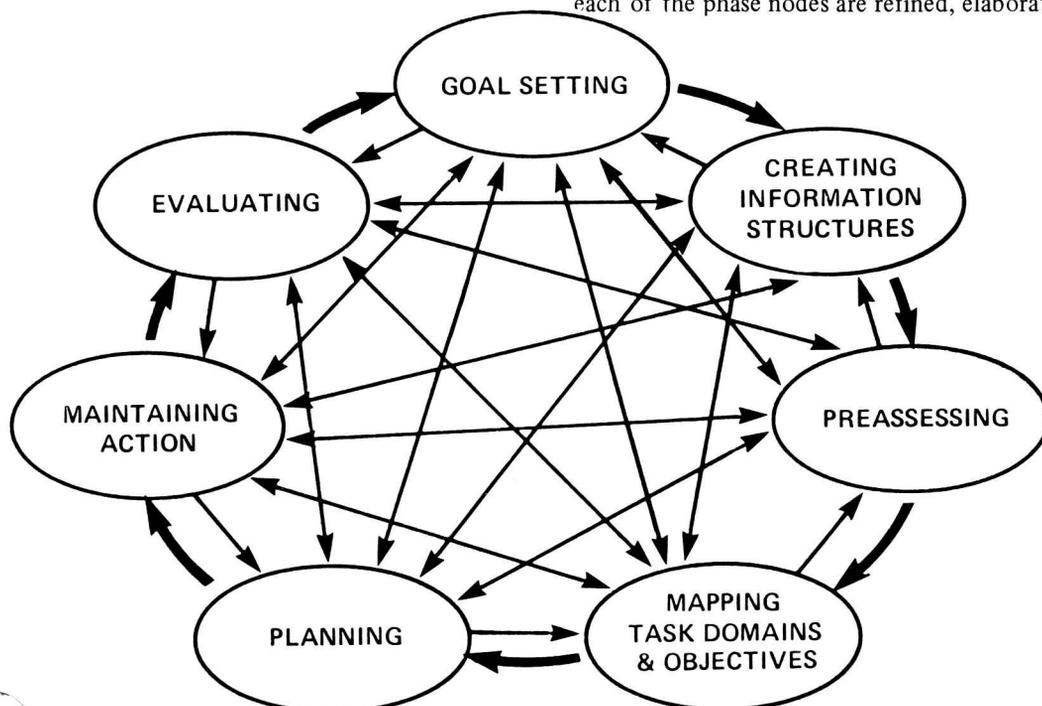


Figure 3. A general schema for self-instruction (from Martin, 1984).

self-instruction may be seen as a major counselling goal, common to many counselling interventions.

The nature of the cognitive competence underlying self-instruction has been described by Martin (1984). Working from the general model of cognitive competence described in Figure 2, Martin proposed a multi-level, hierarchical set of schemata thought to underlie self-instructional competence. While a description of the more detailed levels of these schemata is unnecessary for the purposes of the present paper, and outline of the seven

and reworked during the dynamic course of self-instruction. While the general model of instruction in Figure 3 is consistent with most theories of instruction (Reigeluth, 1983), the phase of "creating information structures" is somewhat unique to self-instruction. A self-instructor must possess adequate stores of procedural and declarative knowledge to permit the goal-directed execution and instantiation of all phases in the schema displayed in Figure 3. While an external instructor supplies the raw material for these stores in most kinds of instruction, in self-instruction, the individual learner must access

and incorporate sources of required declarative and procedural information without the direct, immediate guidance of an external instructor. Martin (1984) provides detailed descriptions of secondary schemata that define the specific tasks and decisions associated with each of the general phases of self-instruction portrayed in Figure 3, and interested readers are urged to consult this source for more elaborated information about this model of self-instruction.

The purpose of this section of the paper has been to define and elaborate the notion of cognitive competence and related concepts. A general model of cognitive functioning (see Figure 1) has been described, and a general model of cognitive competence, consistent with this model of cognitive functioning, has been discussed (see Figure 2). Finally, a generic schema for self-instruction has been presented briefly (see Figure 3). The rationale for considering this schema is that it, or other schemata similar to it, is an excellent example of the kind of open-ended schema that clients can pull from their declarative knowledge stores and house in working memory (see Figure 2) to assist competent functioning in a wide variety of goal-attainment contexts. As such, it is a useful schema to consider in attempting to assist clients in counselling to develop and enhance cognitive competence in relation to the accomplishment of their goals and the alleviation of their concerns and problems.

The Instructional Counselling Process

One approach to counselling, although certainly not the only one, that attends to the development of the various structures and processes that define client cognitive competence in relation to the realization of client goals is the model of instructional counselling developed initially by Martin and Hiebert (1982, in press). This approach to counselling relies heavily on the use of methods of instruction (i.e., facilitation of client competence in relation to client goals through the design of conditions for relevant client learning) and instructional design borrowed from contemporary instructional science. In what follows, a brief summary of the ways in which instructional counselling attends to the development of the various elements of client cognitive competence depicted in Figure 2, will be provided.

Perhaps the most significant aspect of instructional counselling is the purposeful manner in which it attempts to teach clients generalizable skills, knowledge, and attitudes of self-instruction so that they can deal effectively with a wide variety of concerns and problems. One of the major goals of instructional counselling is the development of working schemata or plans in clients' memories similar to the self-instructional schema depicted in Figure 3. Instructional counselling is structured around five main phases that display a dynamic interaction across the entire course of counselling (Figure 4). In many ways, fostering the development of working schemata or plans of self-instruction in clients is a matter of assisting clients to internalize the instructional counselling process itself (note the similarity of the phases in Figures 3 and 4).

At each phase in the instructional counselling process, the immediate concerns and problems of the client are the initial subject matter to which counselling is directed. Instructional counsellors, as effective teachers, explicitly describe and help clients to understand the instructional counselling process as it is enacted within the confines of immediate client goals. As each phase proceeds, clients are encouraged gradually to take a greater and greater part in important decisions and tasks that define the process. No phase of instructional counselling should terminate until the counsellor is satisfied that the client understands the nature of the tasks and decisions that define the phase, and could apply this understanding in systematic, future attempts to resolve similar difficulties or to approach similar goals. In short, instruction directed at the amelioration of immediate client concerns is seen as an example or an instantiation of the instructional schema depicted in Figure 3. To ensure that clients have instantiated a functional self-instructional schema, instructional counsellors, once immediate client concerns and problems have received attention, encourage clients to work single-handed (under observation by the counsellor) to design, implement, and evaluate instructional activities intended to promote learning in relation to client objectives and goals other than those immediate goals that initially brought them to counselling. For example, a client who has learned to dispute dysfunctional, irrational internal dialogue that previously prevented her from interacting with new classmates, may extend this method to interactions in other novel situations or to other tasks (e.g., speaking in public) that elicit

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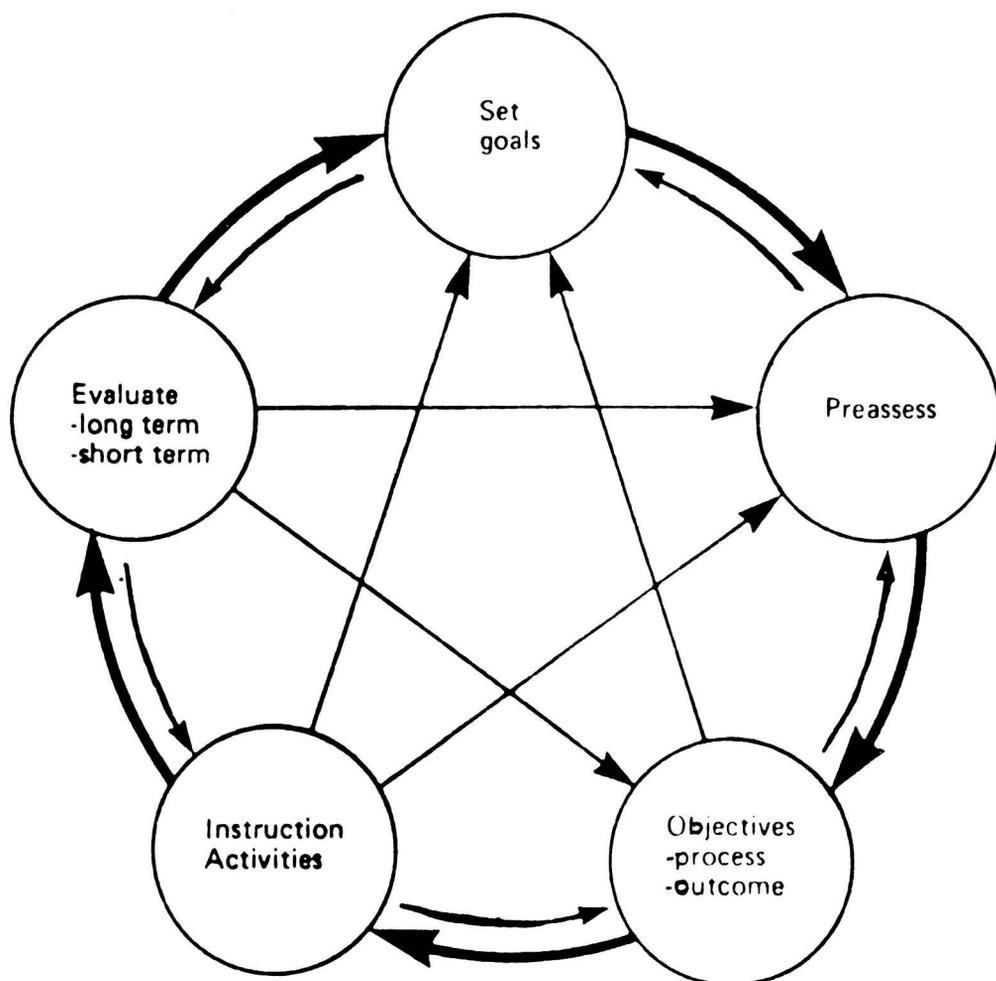


Figure 4. Phases of instructional counselling (from Martin & Hiebert, in press).

similar irrational thoughts. In a similar manner, a self-exploring client who has become aware of his negative feelings toward his spouse and learned to integrate these with his positive feelings may extend this process of awareness

and integration to other previously un-integrated aspects of his "self-schema." (Note that similar generalizations may be promoted by rational-emotive and gestalt approaches to counselling respectively. Instructional counselling simply tries to foster such learnings and generalizations within a systematic, purposeful framework based on insights and methods of instructional and cognitive science.)

Before instructional counselling has been completed, clients should be functioning as self-instructors and have incorporated a working schema or plan similar to that portrayed in Figure 3 into their cognitive systems. This schema then is available for

future use by the client in relation to future concerns and problems. It becomes a major part of the cognitive competence of the client as an effective, independent individual.

Instructional counselling also pays particular attention to the development of client declarative knowledge structures in relation to client problems and difficulties. This is an area that has *not* been emphasized in most approaches to counselling. Instructional counselling works on the premise that knowledge is power, and that clients often experience difficulties because they are unfortunately ignorant of information relevant to their concerns. A good example of this is the battered woman who is uninformed with respect to the considerable body of information about battering, cycles of battering, and the characteristics of batterers. Without such information, the woman makes a number of

erroneous assumptions about her situation (including taking responsibility for it), that result in her continued participation in a destructive pattern of domestic violence. To ensure that clients are not handicapped by lack of relevant declarative knowledge, instructional counsellors can assist clients in uncovering sources of valid and reliable information that pertain to their difficulties. Studies by Martin, Marx, and Martin (1980); Leal, Baxter, Martin, and Marx (1981); and Haynes, Marx, Martin, Wallace, Merrick, and Einarson (1983) demonstrate the effectiveness of instructional counselling interventions that pay particular attention to assisting clients to acquire relevant declarative knowledge. In the first of these studies (Martin, Marx, & Martin, 1980), adolescents who experienced chronic academic failure were assisted, in part through the acquisition of information concerning effective study skills and methods. In the latter studies (Haynes et al., 1983; Leal et al., 1981), declarative knowledge relevant to test anxious students, such as information about the nature of anxiety and its dysfunctional effects on performance in test-taking situations, was incorporated into the counselling interventions employed.

Procedural knowledge relevant to clients' concerns also receives attention in programs of instructional counselling. In the studies referenced previously, attention during counselling was devoted to the acquisition of cognitive skills in areas such as relaxation and rational thinking (Haynes et al., 1983; Leal et al., 1981), and processing of information presented in class periods (Martin, Marx, & Martin, 1980). Clearly, the successful instantiation of self-instructional plans in specific problem areas demands the availability of problem-specific declarative and procedural knowledge, and it is the job of the instructional counsellor to assist clients in incorporating such knowledge into their long-term memory stores. Of course, it also is important that clients be able to retrieve and use knowledge that they do possess. Remediation of difficulties in accessing and using information already in memory also can be a focus for counselling intervention. This often occurs when the enactment of clients' procedural knowledge has become so automatic that clients themselves are unaware of its existence, and consequently are unable to apply it to situations and concerns other than those with which it has become associated automatically. Thus, individuals who organize their affairs effectively at work may be troubled by a seeming absence of organizational ability at home. In such cases, instructional counselling may be directed at helping clients

to encode their own capabilities in declarative as well as procedural form so that this information may more easily be retrieved and examined for possible application in a greater number of circumstances.

Instructional counselling also may be devoted to enhancing clients' cognitive and metacognitive processing in relation to their concerns and problems. Martin and Norris (1984) employed instructional counselling in a group context to teach high school students to do such things as monitor their own self-instructional progress, and to attend to relevant features of both internal and external information. Clearly, clients can possess adequate working schema and permanent knowledge to achieve their goals, but may be handicapped by poor processing of information. (Interested readers might find discussions by Wexler (1974) and Anderson (1974) useful with respect to this topic. These authors present analyses of how client-centred counselling can assist clients to acquire more optimal levels of information processing in relation to their ongoing experiences.)

The model of cognitive competence portrayed in Figure 2 alerts counsellors to the various elements of cognitive structure and process that underlie client competence to engage in activity (cognitive, behavioural, and affective) appropriate to the attainment of their goals. In advocating the design of conditions to foster the development of various facets constituting cognitive competence, instructional counselling can be a powerful conceptual and practical tool for counsellors and clients concerned with problems of goal attainment.

Concluding Remarks

The central argument of this paper is that counselling is a prescriptive activity concerned with the development of cognitive competence. Current understandings from the area of cognitive science were employed to develop a general model of the cognitive competence that underlies effective performance and coping in a variety of life situations. The final section of the paper was devoted to a brief demonstration of how this model of cognitive competence can act as a guide to the design of conditions that foster such competence within the system of instructional counselling developed by Martin and Hiebert (1982, in press).

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A major implication of the approach taken in this paper is that counselling, as a discipline, may benefit greatly by incorporating recent advances in the areas of cognitive and instructional science into its theoretical and applied purviews. There is much information in these disciplines that is of direct relevance to the functioning of human beings and the enhancement of human functioning. Future research and theory development in counselling may gain considerable momentum by attention to such information. Counsellor education programs may find it useful to familiarize students of counselling with the possibilities that knowledge in these areas might afford to them in their capacities as future practitioners, researchers, and theorists in the rapidly changing and evolving field of contemporary counselling.

As a final footnote to this paper, I want to emphasize that what makes instructional counselling distinct from other systems of counselling is that it attempts to formulate counselling practice as a prescriptive enterprise based on an integration of information from cognitive and instructional science with information in counselling per se. The approach is unabashedly eclectic in its methods, advocating a functional match between available counselling interventions and client problems and goals. The rather complex notion of cognitive competence developed in this paper may help to identify the various cognitive structures and processes that may be targeted for change and/or development in the process of assisting clients to achieve their goals. I hope that the ideas discussed are of some interest and use to counsellors, whatever their theoretical leanings.

References

- Anderson, J.R. *Cognitive psychology and its implications*. San Francisco: W.H. Freeman, 1980.
- Anderson, W. Personal growth and client-centered therapy: An information processing view. In D. Wexler and L. Rice (Eds.), *Innovations in client-centered therapy*. New York: Wiley, 1974.
- Bower, G.H. Cognitive psychology: An introduction. In W.D. Estes (Ed.), *Handbook of learning and cognitive processes* (Vol. 1). Hillsdale, NJ: Lawrence Erlbaum, 1975.
- Bransford, J.D. *Human cognition: Learning, understanding, and remembering*. Belmont, CA: Wadsworth, 1979.
- Carkhuff, R.R., & Berenson, B.G. *Teaching as treatment*. Amherst, MA: Human Resource Development Press, 1976.
- Chase, W.G., & Simon, H.A. Perceptions in chess. *Cognitive Psychology*, 1973, 1, 55-81.
- Chi, M., Glaser, R., & Rees, E. Expertise in problem solving. In R. Sternberg (Ed.), *Advances in the psychology of human intelligence* (Vol. 1). Hillsdale, NJ: Lawrence Erlbaum, 1982.
- Ellis, A. Skill training in counselling and psychotherapy. *Canadian Counsellor*, 1977, 12, 30-35.
- Gagné, R.M. Learning outcomes and their effects: Useful categories of human performance. *American Psychologist*, 1984, 39, 377-385.
- Glaser, R. (Ed.). *Advances in instructional psychology* (Vol. 1). Hillsdale, NJ: Lawrence Erlbaum, 1978.
- Glaser, R. (Ed.). *Advances in instructional psychology* (Vol. 2). Hillsdale, NJ: Lawrence Erlbaum, 1982.
- Haynes, C.R., Marx, R.W., Martin, J., Wallace, L., Merrick, R., & Einarson, T.L. Rational-emotive counselling and self-instruction training for test anxious high school students. *Canadian Counsellor*, 1983, 18, 31-38.
- Katz, J.H., & Ivey, A.E. Developing the counsellor as teacher: A systematic program. *Canadian Counsellor*, 1977, 11, 176-181.
- Krumboltz, J.D., & Thoresen, C.E. *Counseling methods*. New York: Holt, Rinehart and Winston, 1976.
- Leal, L.L., Baxter, E.G., Martin, J., & Marx, R.W. Cognitive modification and systematic desensitization with test anxious high school students. *Journal of Counseling Psychology*, 1981, 28, 525-528.
- Leinhardt, G. Novice and expert knowledge of individual student's achievement. *Educational Psychologist*, 1983, 18, 165-179.
- Martin, J. Toward a cognitive schemata theory of self-instruction. *Instructional Science*, 1984, 13, 159-180.
- Martin, J., & Hiebert, B.A. *Instructional counseling*. Vancouver, B.C.: Centre for the Study of Curriculum and Instruction, University of British Columbia, 1982.
- Martin, J., & Hiebert, B.A. *Instructional counseling: A method for counselors*. Pittsburgh: The University of Pittsburgh Press, in press.
- Martin, J., Marx, R.W., & Martin, W. Instructional counseling for chronic underachievers. *The School Counselor*, 1980, 28, 109-117.
- Martin, J., & Norris, N. *Teaching self-instruction to high school students*. Paper presented at the annual meeting of the Canadian Society for the Study of Education, Guelph, Ontario, 1984.
- Reigeluth, C.M. (Ed.). *Instructional design theories and models: An overview of their current status*. Hillsdale, NJ: Lawrence Erlbaum, 1983.
- Sorenson, G. *Toward an instructional model for counseling*. Los Angeles: University of California, Center for the Study of Evaluation of Instructional Programs, 1967.
- Wexler, D. A cognitive theory of experiencing, self-actualization and therapeutic process. In D. Wexler and L. Rice (Eds.), *Innovations in client-centered therapy*. New York: Wiley, 1974.
- Winne, P.H. Cognitive processing in the classroom. In M.J. Dunkin (Ed.), *Teaching and teacher education*. London: Pergamon, 1983.

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