Reasoning and the Art of Therapy for Spinal Cord Injury

Cynthia Creighton, Marcel Dijkers, Normajean Bennett, Karmen Brown

Key Words: qualitative method • therapeutic activities

In this pilot study, qualitative methodology was used to examine the clinical reasoning of four experienced occupational therapists as they presented and modified therapeutic activities to treat patients with spinal cord injuries. The therapists demonstrated the multi-layered thinking discovered in previous research, but hierarchical structuring of knowledge emerged as an unexpectedly dominant theme in their reasoning. Examples of hierarchical thinking about therapeutic activity included creating mental files of therapy tasks and materials sequenced from elementary to advanced and determining the level of difficulty at which to present an activity in order to build the patient's skills in a stepwise manner. The therapists reported that they learned to make decisions about the use of activities in treatment by observing skilled clinicians and by treating patients.

The complex process of choosing, presenting, and modifying therapeutic activities during the implementation of a treatment plan has been called "the art of therapy" (Koomar & Bundy, 1991, p. 252). In their discussion of occupational therapy intervention based on sensory integration theory, Koomar and Bundy stated that "The orchestration of each treatment session is an art . . . Because it is so difficult to learn, the art of therapy requires considerable discussion" (p. 252). Koomar and Bundy identified several elements of an effective treatment session that involved sophisticated decision-making, including (a) deciding where to begin intervention, (b) adjusting the activities so they provide the "just-right challenge" (p. 252), (c) motivating the patient to engage in the activities, (d) creating a transition from one activity to another, and (e) deciding when to discontinue activities.

Researchers in other areas of occupational therapy practice agree that the thinking that guides skillful management of activity within a treatment session is very difficult for a therapist to learn. Mosey (1973) observed that "one of the major mistakes therapists make with [psychiatric] patients is to assume that they are able to do things they are really not able to do. Treatment is often begun at a level far above where the patient is" (p. 29). Allen (1985) stated that when working with patients who have cognitive deficits, "beginning students often find it difficult to know when to step in and change a task demand . . . Therapists seem to have a tendency to err in one direction or another, either helping too much or too little" (p. 101). Baum and Christansen (1991) noted that "students frequently have difficulty knowing when to grade an activity to meet the needs of the client" (p. 610).

A first step in helping students and inexperienced occupational therapists become artisans may be to investigate some of the decisions that a proficient therapist .

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makes when using activities as treatment and to examine the reasoning associated with those decisions. Although reports based on the American Occupational Therapy Association–American Occupational Therapy Foundation Clinical Reasoning Study analyzed many aspects of therapists’ thinking throughout the occupational therapy process (Crepeau, 1991; Fleming, 1991b; Mattingly, 1991), little attention has been given to therapists’ thinking about the central concept of activity.

This article presents the findings of pilot research on decision making related to the therapeutic use of activity. The study was conducted at a regional rehabilitation center. To focus the research, we examined the reasoning of occupational therapists who worked with one diagnostic group (patients with quadriplegia resulting from or secondary to spinal cord injury) toward a specific goal (improving function of the upper extremities).

Method

Subjects

The subjects were four occupational therapists assigned to the spinal cord injury (SCI) treatment team of the rehabilitation center. They were graduates of three accredited educational programs located in Michigan. Three of the therapists had 6 to 8 years’ experience, including more than 2 years’ experience working full time with patients with SCI. Although the fourth therapist had less experience (2½ years, including 1 year on the SCI team), she was regarded by her peers as a skilled clinician.

Each of the therapists was observed as he or she worked with one patient with quadriplegia throughout the patient’s 6-week rehabilitation program. The patients presented with complete and incomplete traumatic injuries at the C-5 to C-7 levels. They were men aged 17, 34, and 45 years, and a woman aged 66 years. Three were inpatients who were 1 to 2 months postinjury. The fourth was an outpatient who was recovering from hand surgery related to an SCI sustained 1½ years earlier.

Data Collection

Qualitative methodology was used in collecting and analyzing the data. The first author observed the four therapists and their patients in a total of 19 treatment sessions. Activities observed included range of motion and strengthening exercises, tendostasis training—object manipulation, feeding, dressing, writing, and woodworking. Sessions related to goals other than development of upper extremity function were not observed. During each visit, the actions of the therapist and patient and the verbal communication between them were documented in field notes. Four of the sessions were videotaped (with permission from the participants). A contact summary form was completed immediately after each observation to track important themes and questions that emerged from the experience (see Figure 1).

The therapists were interviewed at the beginning and end of the study and after each observation. Interview questions were related to transitions observed during the therapy sessions, that is, changes in the activities presented and in the content of the interactions that took place (e.g., the change from sanding wood with the right hand to sanding with the left hand, or from talking about movies to teaching a technique). They included descriptive questions (e.g., “What did you want to accomplish today?”), structural questions (e.g., “Tell me all of the ways you reinforced learning for Mrs. W.”), and contrast questions (e.g., “Would you have ended the session differently if he were an inpatient instead of an outpatient?”) (Spradley, 1979). Fifteen of the interviews were tape recorded and transcribed.

Researchers

The first author, a manager in the occupational therapy department where the subjects were employed, had primary responsibility for data collection, analysis, and interpretation. Although her belief that activity is the core of occupational therapy focused the study, she had little experience with the application of activity in spinal cord injury rehabilitation and no biases about the patterns of thinking involved. The second author managed the computer-based portion of data analysis. He had an interest in the processes of clinical reasoning but did not participate in interpretation of the data because he had a social science rather than a clinical background. The third and fourth authors, both seasoned occupational therapy educators (one with experience in psychiatry and the other with experience in physical dysfunction), helped ensure the trustworthiness of the data and prevent interpreter bias. They reviewed the printed and taped material from perspectives independent of the rehabilitation center and contributed to the development of the coding and interpretive schemes.

Data Analysis

Selected factual information from the observations (e.g., sequences of activities presented, methods used to modify...
ify activities) was summarized in written lists. A four-step procedure was used to code transcribed interviews. First, the material was divided into chunks, including a question and answer (or a portion of a long answer). Then the first author assigned a global code to each chunk to indicate whether it was related primarily to beginning intervention (selecting an activity and an initial level of difficulty), progressing activities (grading up), simplifying (grading down) or discontinuing activities, motivating the patient, or teaching and learning the art of therapy. These five categories were treated as the domains for exploration.

After reviewing the categorized material and discussing impressions about it with the third and fourth authors, the first author developed an interpretive coding scheme that applied to the first three domains. Reasons for the decisions therapists made about activities were grouped as follows: (a) issues related to the physical status and performance of the patient (e.g., medical complications), (b) issues related to the emotional or cognitive status and needs of the patient (e.g., need for control), (c) issues related to the practice environment (e.g., estimated length of stay), and (d) issues related to occupational therapy theory and technique (e.g., beginning with exercise and moving toward functional tasks). Each of the 9 or 10 issues that fell into each group was assigned a 2-digit code. These interpretive codes were applied to the chunked material (see Table 1), and the complete coded text of the interviews was entered into a computer database, with the LTT Ethnoscript Qualitative Software program (Leininger, Templin, & Thompson, 1991). This software allowed the researchers to search for and retrieve text related to certain words and to quickly identify patterns in the data (e.g., classes of issues dominant in discussions about grading activities down). To facilitate retrieval, interview data assigned to the two domains to which the interpretive coding scheme did not apply was highlighted with a marking pen.

**Results**

**Beginning Intervention**

When asked, "Why did you start with this activity?" the therapists demonstrated the multilayered thinking discovered in the Clinical Reasoning Study (Fleming, 1991b; Mattingly, 1991). Their initial responses reflected procedural reasoning; they usually gave a physically oriented rationale (e.g., he needs to work on strengthening that was embedded in a theoretical approach to treatment (e.g., if we improve his proximal strength, he will have better control in functional activities). But further discussion revealed that conditional reasoning (thinking about the whole condition and about the patient’s possible future) shaped these decisions. For example, one therapist explained why she began a session with shoulder exercises:

I know that C. will have trouble with this. He isn’t pushing his chair, which would inevitably strengthen his proximal musculature. He’s been real resistant to doing that, and it’s going to make it hard for him to do functional activities. He’s going to sabotage himself.

Decisions about how to begin an activity (e.g., how much weight to put on a deltoid aid or which instructional strategy to use) were strongly associated with a sequential, hierarchical style of thinking. The therapists viewed patients as occupying a rung on a ladder of performance and function, with the highest step defined by the optimal outcome possible given the patient’s level of injury and other medical and physical characteristics, learning and coping styles, and access to social and financial resources. Each therapy session was designed to progress the patient toward this highest rung. One therapist said:

We begin to look at where she is one day, and evaluate her output—whether or not it’s consistent and whether or not she occasionally succeeds in performing certain tasks. And then we build from there and provide her with tasks that will reinforce what she learned the previous day, but also introduce a little bit of new information to her, or a new activity, or a new level of complexity in the same activity.

Treatment tasks and therapy materials were also described in a hierarchical way (e.g., feeding and communication were addressed before bathing, dressing clothes was introduced after removing clothes was mastered, felt-tip markers were known to be easier than ballpoint pens). The therapists spoke of a “natural progression” in activities and of building mental “files” of therapeutic activities.

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**Table 1 Examples of Coded Data**

<table>
<thead>
<tr>
<th>ID</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>326</td>
<td>777</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Q: Was that the first time you tried Velcro® checkers since surgery?</td>
</tr>
<tr>
<td>2</td>
<td>326</td>
<td>999</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Yes— I thought he would be able to do it without the splint, with a block in every space.</td>
</tr>
<tr>
<td>2</td>
<td>326</td>
<td>777</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Q: But it got hard for him working on the left side of the board, so you made some changes?</td>
</tr>
<tr>
<td>2</td>
<td>326</td>
<td>505</td>
<td>306</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>He has better control working near his hand, so I moved some of the checkers to that side. I spaced the ones on the left apart, so he could see and reach them better (the task sensation, so he needs to see what he is doing).</td>
</tr>
<tr>
<td>2</td>
<td>326</td>
<td>777</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Q: Then you let him work hard and finish the board?</td>
</tr>
<tr>
<td>2</td>
<td>326</td>
<td>999</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>He tells me if it’s too hard.</td>
</tr>
</tbody>
</table>

**Note:** Columns ID—C1 identify the data. The numbers in columns C2–C6 are codes for the corresponding chunk of data. For example, 326 is the code for a question, and 105 means the data relates to grading an activity down to improve control of movement. ID = Identification of patient.
and their variations—sequenced from the most elementary to the most advanced. Activity hierarchies were constructed by each therapist for each patient, although basic similarities in their content were observed. Building sequences involved a substantial amount of synthesis. One therapist’s feeding file, for example, integrated four sequences related to physical issues (e.g., postural alignment, upper extremity support) with sequences in nine other dimensions (e.g., from more to less adaptive equipment, from private to social settings, from intervening to prevent mistakes to encouraging independent problem solving) (see Table 2).

In most cases, therapists brought to a session the supplies that they needed to present treatment at a target level in the appropriate sequence, along with the supplies for one or two steps up and down. For example, in addition to the short writing splint and unlined paper one therapist planned to use for a session focusing on communication skills, she brought a long splint that would provide wrist support (one step down) and lined paper for more precise writing exercises (one step up).

Three themes dominated the therapists’ thinking about choosing the target level. One of these was generalization from observations made in one area of performance to another.

I knew where to begin through other functional tasks that we’ve been doing, and through my manual muscle testing and range of motion. I had a frame of reference. You know, as far as what her abilities were.

A second theme was related to the belief that patients whose lives were so recently disrupted by traumatic injury needed to experience success and regain feelings of control. One therapist said

When we start off, I want them to succeed, not 100% of the time, but to succeed during that initial session because that ties in to motivation and all those other variables.

A third theme was the therapists’ perception of a new activity as an opportunity to experiment in order to establish a baseline for performance.

Table 2
Choices From Activity File in Successive Feeding Sessions with a Patient with Quadriplegia

<table>
<thead>
<tr>
<th>Date</th>
<th>Sequence</th>
<th>Date</th>
<th>Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/2</td>
<td>3/12</td>
<td>3/2</td>
<td>3/12</td>
</tr>
<tr>
<td>Postural Alignment</td>
<td>Environment</td>
<td>3-4°</td>
<td>Community (home or restaurant)</td>
</tr>
<tr>
<td>3-45° lap belt</td>
<td>4-</td>
<td>5-</td>
<td>Dining room on unit</td>
</tr>
<tr>
<td>2- Lateral supports, chest and lap belts</td>
<td>2-</td>
<td>6-</td>
<td>Private room on unit</td>
</tr>
<tr>
<td>1- Contoured seating system</td>
<td>1-</td>
<td>5-</td>
<td>Occupational therapy clinic</td>
</tr>
<tr>
<td>Upper Extremity Support</td>
<td>Food Texture</td>
<td>8-</td>
<td>No equipment</td>
</tr>
<tr>
<td>7- Decreased time in deltoid assist</td>
<td>3-</td>
<td>6-</td>
<td>Decreased counterbalance weight</td>
</tr>
<tr>
<td>6- Decreased counterbalance weight</td>
<td>1-</td>
<td>5-</td>
<td>Deltoid assist with counterbalance</td>
</tr>
<tr>
<td>5- Deltoid assist with counterbalance</td>
<td>4-</td>
<td>4-</td>
<td>Suspension feeder</td>
</tr>
<tr>
<td>4- Suspension feeder</td>
<td>3-</td>
<td>3-</td>
<td>Nutritive mobile arm support</td>
</tr>
<tr>
<td>3- Ball-bearing mobile arm support</td>
<td>2-</td>
<td>2-</td>
<td>Elevating proximal mobile arm support</td>
</tr>
<tr>
<td>2- Elevating proximal mobile arm support</td>
<td>1-</td>
<td>1-</td>
<td>Winslow feeder</td>
</tr>
<tr>
<td>Plaque-To-Mouth Pattern</td>
<td>Food Presentation</td>
<td>5-</td>
<td>Hospital tray</td>
</tr>
<tr>
<td>5- Cutting, then scooping food</td>
<td>3-</td>
<td>2-</td>
<td>Chunks</td>
</tr>
<tr>
<td>4- Scooping food</td>
<td>1-</td>
<td>1-</td>
<td>Puree (pudding, mashed potatoes)</td>
</tr>
<tr>
<td>3- Increased resistance, repetitions</td>
<td>Food Temperature</td>
<td>2-</td>
<td>Hot or cold</td>
</tr>
<tr>
<td>2- Active resistance, repetitions</td>
<td>1-</td>
<td>1-</td>
<td>Room temperature</td>
</tr>
<tr>
<td>1- Active range of motion</td>
<td>Food Preparation</td>
<td>3-</td>
<td>Scoop dish on nonslip mat</td>
</tr>
<tr>
<td>Endurance</td>
<td>Supervision</td>
<td>3-</td>
<td>Independent</td>
</tr>
<tr>
<td>3- Whole meal</td>
<td>5-</td>
<td>4-</td>
<td>Family involvement</td>
</tr>
<tr>
<td>2- Part of meal</td>
<td>3-</td>
<td>5-</td>
<td>Nursing staff member</td>
</tr>
<tr>
<td>1- One to three bites</td>
<td>2-</td>
<td>2-</td>
<td>Small group with therapist</td>
</tr>
<tr>
<td>Utensils</td>
<td>Teaching Strategies</td>
<td>1-</td>
<td>Single patient with therapist</td>
</tr>
<tr>
<td>7- Standard utensil</td>
<td>2-</td>
<td>1-</td>
<td>No special strategies</td>
</tr>
<tr>
<td>6- Standard utensil with enlarged handle</td>
<td>2-</td>
<td>1-</td>
<td>Slower pace, fewer distractions, more cueing, more repetition, more reinforcement by other staff member or family member</td>
</tr>
<tr>
<td>5- Bent utensil with plastic enlarged handle or swivel spork (spoon-fork)</td>
<td>1-</td>
<td>1-</td>
<td>Failure allowed</td>
</tr>
<tr>
<td>4- Bent fork with foam handle</td>
<td>1-</td>
<td>1-</td>
<td>Assured success</td>
</tr>
<tr>
<td>3- Bent spoon with foam handle</td>
<td>1-</td>
<td>1-</td>
<td>Finger-feed</td>
</tr>
<tr>
<td>2- Universal cuff</td>
<td>Table</td>
<td>2-</td>
<td>Wheelchair lapboard</td>
</tr>
<tr>
<td>1- Finger-feed</td>
<td>2-</td>
<td>1-</td>
<td>Wheelchair lapboard</td>
</tr>
<tr>
<td>1- Wheelchair lapboard</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Higher numbers indicate more difficult or advanced variations within each sequence.
Grading Activities

Within a few seconds after presenting an activity at the targeted level of difficulty, the therapists decided whether to continue it or to make adjustments. When questioned about their thinking at this point, they indicated that they were comparing the patient's performance with a standard for quality of movement, as well as looking for successful completion of the task.

Question: Did you think he'd be able to tie and untie shoelaces, or not?

Answer: I thought he could untie—it didn't think he was going to do as well as I did, but you never know until somebody attempts it. A lot of times people surprise you when they're able to do something or they use a technique of their own.

Question: You could tell right away that it wasn't going to work?

Answer: Oh, yes—he couldn't use the pattern I wanted, and the peg slipped right out of his fingers.

Many of the decisions associated with grading a task up or down in a hierarchy were arrived at through the hypothesis testing that characterizes procedural reasoning. As they searched for an ideal balance between stimulating challenges and successful outcomes, the therapists presented many variations in the shape, size, and position of objects, their teaching techniques, and the adaptive equipment that they used. They attended to verbal and nonverbal cues from the patient to determine the effect of each modification (e.g., "He was taking too much time to get the position right," "I got a sense that she was beginning to understand").

An interesting finding of this study was that contextual issues (factors related to the practice setting and the professional's personal skills and values) were also influential in the decisions that were made about where to start and when to adjust activities. The therapists' statements supported Schell and Cervero's (1993) proposition about "pragmatic reasoning" (p. 608) in occupational therapy: The practice environment and the therapist's expectations of her recovery were directly connected with her faith— the idea of being healed through intervention. So her own goals were never very realistic. She became passive. Tired to spark imitation at that point was more from a survival standpoint. Explaining to her that her basic health and well-being (in a nursing home) would be contingent upon staying involved, staying alert, actively advocating for herself.

Discontinuing Activities

As expected, decisions about when to end the therapy session were often based on pragmatic issues (e.g., another patient was waiting to be treated). Three of the therapists in this study consistently paced treatment so that the end of the treatment hour coincided with the successful completion of an activity. All of them often spent the last few minutes of each session reviewing with....

Motivating Patients to Participate in Activities

As predicted, therapists' decision making in this domain reflected narrative reasoning (making and telling stories), rather than scientific reasoning. The therapists said that their judgments about when and how to encourage a patient and when to back off were subjective; that they were based on "really listening to and understanding the person."

One therapist explained:

I don't think we can generalize. There are some people that you can push and they'll respond and then with others you're going to have to take it slow and give them extra rest periods, or let them take more control of what's going on.

During the research, all of the therapists were faced with a similar situation: A patient resisted or failed to follow through with an activity. But each therapist handled the behavior differently, because each one interpreted it within the framework of the patient's story. One therapist agreed to end the treatment session because the patient "likes to work hard, and he tells me when he's had enough."

Another clinician used humor to engage her adolescent patient in the activity. This therapist explained:

Unfortunately, this is a lot like being in school for some of our young kids, and a lot of them either dropped out of school or they hate school. But something he really likes is movies, and I see a lot of films. So we were laughing about strengthening and Arnold Schwarzenegger being a muscle-bound guy. So he was acting like Schwarzenegger and talking like him and he lightened up a little bit.

Another therapist bargained with her patient: She would tie one shoelace if he would tie the other. She said that she wanted "to give him a break," because she knew he had had a long, frustrating day.

Another therapist "shocked" a patient into action.

Even though she did not come out and say it, I think that her expectations of her recovery were directly connected with her faith—the idea of being healed through intervention. So her own goals were never very realistic. She became passive. Tired to spark imitation at that point was more from a survival standpoint. Explaining to her that her basic health and well-being (in a nursing home) would be contingent upon staying involved, staying alert, actively advocating for herself....
the patient what was accomplished and discussing follow-up activities or plans for the next day's therapy. Their reasoning in this area reflected a narrative style; as in Mattingly’s allegory (1991), the therapists were building suspense and a happy ending into the therapeutic story.

Teaching and Learning the Art of Therapy

All of the therapists who participated in this research reported that they learned how to manage a therapy session primarily by working with more experienced colleagues and by practicing with patients. One therapist said that reference books and videotapes gave her a framework for selecting and presenting activities to patients with SCI but that most of her knowledge came from "just observing patients and other therapists problem solving." Another practitioner commented that if she were to use didactic methods to teach a student how to modify an activity, she would have to "break the components down into incredibly small parts—do an activity analysis of my activity analysis!" She explained:

I can tell a student how to do the treatment, but I don't know if you can verbally instruct somebody in why, and how you know, and what to look for... Looking at an activity and figuring out why it doesn't work and how you could move it over here, move it over there, pick it up in a different way—the student really has to watch me.

Conclusion

The data from our pilot research indicate that in regard to clinical reasoning, the individual treatment session is a microcosm of the total occupational therapy process. The therapists in the study used all of the thinking styles (procedural, conditional, narrative) identified in the Clinical Reasoning Study. As they managed therapeutic activities, they shifted frequently and easily among reasoning strategies and proficiently layered and integrated them. Also of note was the pragmatic reasoning revealed when the therapists discussed their decisions about presenting and modifying activities. Although issues related to the practice environment were less frequently cited than issues related to theory or to the patient's physical status, they did emerge in all but two of the interviews and in all relevant domains (choosing an activity and a target level of difficulty, grading up, and grading down). The therapists did not make decisions on an abstract level and then revise them in light of environmental constraints. Instead, they built personal values and environmental considerations into their activity hierarchies and choices. Schell and Cervero suggested that decisions about therapeutic activity did appear to be the result of interaction between "the mind at work and the world in which it works" (Lave, cited in Schell & Cervero, 1993, p. 606).

Perhaps the most important conclusion we reached was that, despite recent interest in the phenomenological perspective in clinical reasoning, we must avoid underestimating the importance of logical thinking. Hierarchical structuring of knowledge and hypothesis testing were such powerful themes in the decisions that these therapists made about the therapeutic use of activity that we challenge Mattingly's (1991) argument that "a narrative model of reasoning, as opposed to scientific reasoning in the traditional sense, is fundamental to the thinking of occupational therapists." (p. 998).

Nor can the logical thinking we observed be dismissed as simple or routine. Developing activity sequences involved much more synthesis and individualization than would have been apparent if therapists were merely using a "standard operating procedure approach to clinical reasoning" (Rogers & Masagatani, 1982, p. 215).

Questions for further research include: First, does the scientific model of reasoning dominate in specific areas of occupational therapy practice or in certain therapeutic situations? For example, does SCI rehabilitation, with its emphasis on levels of function and steps toward independence, promote hierarchical thinking? Do therapists think in terms of stories and images when discussing patients with colleagues but in terms of logical sequences and hypotheses when using activities as treatment? Second, does the ability to organize knowledge in a hierarchical manner differentiate expert from less skilled clinicians in occupational therapy, as some investigators (Bordage & Lemieux, 1991; Grant & Marsden, 1987) believe it does in medicine? No beginners were included in our research. However, Fleming (1991a) observed that two of the three experienced therapists interviewed most extensively in the Clinical Reasoning Study "had a clear hierarchical structure to their knowledge" (p. 993), and she reported no such finding for the novices. Finally, how do beginners process their observations of experienced practitioners at work? How do they use the information gained to develop their own activity files and strategies for managing treatment? How can we organize fieldwork and mentoring experiences to facilitate their learning?

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References


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- Gender differences in performance on the BTE Work Simulator
- Use of occupational therapists in mental health settings

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