Teaching Diagnostic Reasoning: Using a Classroom-as-Clinic Methodology With Videotapes

Maureen E. Neistadt, Ruth E. Smith

Key Words: curriculum • education

Objectives. The purpose of this study was to examine the effect of a "classroom-as-clinic" format, using videotaped occupational therapy evaluations, on students' diagnostic reasoning skills. In the classroom-as-clinic format, students write a problem list on the basis of preliminary client information before viewing the videotape.

Method. A post-hoc experimental design was used to compare the accuracy of treatment plan problem lists for two groups of senior occupational therapy students—one group viewed two videotapes of client-therapist interactions without a classroom-as-clinic format (n = 82), and one group viewed the same videotapes within the context of a classroom-as-clinic format (n = 45). Both groups viewed the same two videotapes. Videotape 1 was of a client with a brain stem infarct, and Videotape 2 was of a client with traumatic brain injury.

Results. Subjects experiencing a classroom-as-clinic format identified significantly more occupational therapy problems for Videotape 1 than those who did not have pre-evaluation information. There was no significant difference between the two subject groups in the accuracy of their problem lists for Videotape 2. Only subjects in the non-classroom-as-clinic group showed a significant improvement from Videotape 1 to Videotape 2 in occupational therapy problem identification.

Conclusion. This study suggests that to be truly effective when used with videotapes, the classroom-as-clinic methodology needs to be combined with explicit coaching in problem sensing and problem definition.

Clinical reasoning—the thought processes occupational therapy practitioners use during evaluation and treatment—underlies all occupational therapy practice (Dutton, 1995; Mattingly & Fleming, 1994). Therefore, occupational therapy student preparation should include the explicit teaching of clinical reasoning (Royeen, 1995). Strategies for teaching the various components of clinical reasoning have been described and analyzed by several researchers (Cohn, 1989; Neistadt, 1996; VanLeit, 1995). Neistadt (1987, 1992) has shown that a classroom-as-clinic methodology where occupational therapy students meet and evaluate persons with disabilities is effective in teaching students the clinical reasoning process associated with evaluation and treatment planning. The present study examined the effectiveness of a variation on that method that uses videotapes of clients instead of face-to-face meetings.

Literature Review

Clinical Reasoning

Several types of clinical reasoning have been identified in...
the occupational therapy literature since the early 1980s: (a) procedural reasoning, which involves identifying occupational therapy problems and treatment strategies and focuses on the disease or disability; (b) interactive reasoning, which deals with how the disability or disease affects the client (i.e., the client’s illness experience) and focuses on the client as a person; (c) conditional reasoning, which involves an ongoing revision of treatment to meet the client’s needs and focuses on the client’s current and possible future social contexts; (d) pragmatic reasoning, which considers the treatment environment and therapist values, knowledge, abilities, and experiences and focuses on the treatment possibilities within a given treatment setting; and (e) narrative reasoning, which deals with the client’s occupational story as reflected in his or her activity preferences and focuses on the process of change needed to reach an imagined future (Clark, 1993; Fleming, 1991a, 1991b; Mattingly 1991a, 1991b; Neuhaus, 1988; Rogers & Holm, 1991; Schell & Cervero, 1993). The current study focused on a method to reach the procedural reasoning involved in the evaluation and identification of occupational therapy problems.

Rogers and Holm (1991) referred to the thought process underlying the evaluation and identification of occupational therapy problems as diagnostic reasoning. The occupational therapy problem list that results from this thought process “describes the actual or potential effects of disease, trauma, developmental disorders, age-associated changes, environmental deprivation, and other etiologic agents on occupational status” (p. 1045). The occupational therapy problem list suggests treatment options a therapist might offer a client during collaborative treatment planning.

The diagnostic reasoning process involves both problem sensing and problem definition: “A therapist senses a problem by framing it, that is, by deciding what will be included in the picture. The picture inside that frame is the clinical image” (Rogers & Holm, 1991, p. 1045). Occupational therapists begin to form a clinical image during the chart review stage of evaluation. This image is influenced by the reason for occupational therapy referral; the practice setting; the therapist’s experience and frames of reference; the client’s medical condition, age, and gender; and the severity of the client’s condition (Rogers & Holm, 1991). The clinical image would include mental hypotheses about the client’s potential problems—hypotheses formed via deductive reasoning about the information available from the chart review and other preevaluation information (Rogers, 1983; Rogers & Masagatani, 1982). This image helps to guide problem definition.

Problem definition is a process that yields a concise and precise description and naming of the client’s problems: “As a result of this descriptive process, the therapist’s clinical image of a patient becomes more like the actual patient encountered in the clinic” (Rogers & Holm, 1991, p. 1045). Therapists engage in problem definition during the initial evaluation of a client. Rogers and Holm saw problem definition as information processing, with the therapist being a data processor and the client and the client’s living situation being the data fields. The occupational therapist “collects, organizes, analyzes, and synthesizes data about a patient’s occupational status” (p. 1048). As a data processor, the therapist uses “four basic processes: cue acquisition, hypothesis generation, cue interpretation, and hypothesis evaluation” (p. 1048).

Cues are client-related data to which therapists attend. Therapists analyze the cues gathered during initial evaluation to test their preevaluation hypotheses and to form and test new hypotheses. They use a dialectic process to decide between alternative hypotheses and ethical reasoning to shape problem definitions to clients’ values and motivations (Neistadt, 1992). Much of the teaching done in occupational therapy curricula is focused on evaluation and treatment planning skills related to this diagnostic reasoning process.

Teaching Strategies for Diagnostic Reasoning

Several teaching strategies have been suggested to facilitate diagnostic reasoning. These include paper case studies (Field, 1992; Higgs, 1990; Schwartz, 1991), simulated clinical experiences (Neistadt, 1987, 1992; VanLeit, 1995), and actual clinical experiences (Zimmerman, 1995). Our study focused on simulated clinical experiences.

The first author has found the “classroom-as-clinic” methodology to be effective in promoting students’ diagnostic reasoning skills. In these experiences, students are first asked to generate a potential problem list for a client solely on the basis of diagnostic and social history information. This step is analogous to the chart review that a practicing therapist conducts before seeing a client. Students then meet and interview the client. After seeing the client, students are expected to write a revised problem list, one that incorporates current information on the client and the client’s priorities. This part of the process parallels an occupational therapist’s evaluation of and treatment planning with a particular client. Students are graded on the accuracy of their problem lists relative to the problem lists of an experienced therapist. Both lists relate directly to clinical practice: The first represents the mental hypotheses a therapist may generate after an initial chart review, and the second represents the summary problem list from an initial evaluation.

Previous studies have shown that this classroom-as-clinic methodology was effective in improving students’ abilities to accurately analyze preevaluation data and for-
mulate appropriate treatment plans regardless of whether the teaching method was used early or late in an occupational therapy curriculum (Neistadt, 1987, 1992). In Neistadt's (1987) study, seniors and second-year entry-level master's student's significantly improved the accuracy of their premeeting and postmeeting problem lists from the first to the last of four evaluation sessions with clients with neurological disabilities. Review of these data showed a dramatic increase in the number of occupational therapy problems correctly identified from the first to the second evaluation, a slight increase from the second to the third, and a slight drop from the third to the fourth. The dramatic increase from the first to the second session suggested that students in the last year of the occupational therapy curriculum quickly learn to apply diagnostic thinking to clinical situations, given specific feedback about their diagnostic accuracy. In an earlier report of this study, Neistadt (1986) suggested that the drop in accuracy in identifying occupational therapy problems from the third to the fourth evaluation session was due to a discrepancy between the fourth client's functional level and the students' expectations that were based on the client's condition of traumatic brain injury (TBI). Students expected this client to have serious motor problems. When the client walked into the room, demonstrating none of the obvious motor problems the students expected, they believed that the client had no problems. That is, the students were able to reject their first hypotheses but were not able to quickly generate new hypotheses about the client's potential problems. The students' original clinical image for this client was not a useful guide for their observations, and they were unable to change their original problem-sensing framework. Consequently, they did not pick up cues about the client's more subtle motor and cognitive problems.

In another study, Neistadt (1992) introduced the classroom-as-clinic methodology earlier in an occupational therapy curriculum. In that study, students who experienced the classroom-as-clinic methodology during the first year of an entry-level master's occupational therapy curriculum showed significantly better diagnostic skills in the second year of the program than students who did not experience the classroom-as-clinic methodology in their first year. Neistadt modified her classroom-as-clinic methodology in this second study to allow for the fact that students in the second study had not yet completed all their occupational therapy treatment course work as had the students in the first study (Neistadt, 1987). In the first study, students received preliminary information about the clients only 30 min before the evaluation and had only 30 min to write their preliminary problem lists. In the second study, students received the preliminary information about clients the week before the evaluation sessions and had the full week to write their first problem lists, with reference to their books and course notes. Other variations on this method may also be possible. For instance, either the original or modified version of the classroom-as-clinic format could be used with simulated clients (VanLeit, 1995) or with videotapes of clients being evaluated by experienced occupational therapists (Neistadt, 1996).

**Videotapes**

Although supervised experience in evaluating real persons with disabilities is probably the best way to facilitate students' diagnostic reasoning skills, resource issues limit the number of such experiences some occupational therapy curricula can provide. Programs in rural areas, for instance, may have limited access to clinical sites. Programs experiencing increased enrollments may find that their student numbers now overtax the capacities of clinics available to provide course-related clinical experiences. Moreover, some educational programs may not have the budgets to provide transportation for lecturers with disabilities.

One way to deal with these resource issues is to use videotapes of actual clients as instructional aids. Videotape has been discussed by several authors as a tool to promote clinical reasoning skills. For example, Cohn (1989) suggested that videotaping student interactions with actual clients and discussing the clinical reasoning used in those sessions later, with reference to the videotapes, is an effective way to improve students' procedural reasoning abilities. Also relative to procedural reasoning, Bazyk & Fieziorowski (1989) found that videotaped instruction was as effective as instructor demonstration in teaching a motor development screening test to occupational therapy students. Crepeau (1991) suggested using videotapes of exemplary client-therapist interactions to teach interactive reasoning.

This study attempted to combine videotape with the classroom-as-clinic methodology. The research question was the following: Is the use of a classroom-as-clinic format with videotaped occupational therapy evaluations more effective in improving students' diagnostic reasoning skills than the use of videotapes without this format?

**Method**

**Subjects**

The subjects were 127 first-semester senior undergraduate and certificate occupational therapy students at the University of New Hampshire (UNH) who were enrolled in a course about occupational therapy for adults with neurological disabilities. All subjects were in the course lab sections taught by the first and second authors. Subjects were
members of the graduating classes of 1993, 1994, and 1995. Their ages ranged from 20 to 40 years, with the majority of students being 20 to 21 years of age. Five subjects were men, and 122 were women. One subject was Asian, and the rest were Caucasian. All subjects had taken their basic science, pathology, introductory occupational therapy, and introductory psychosocial, physical, and pediatric dysfunction courses before the first semester of their senior year. The subjects had not yet completed advanced occupational therapy course work about physical, psychosocial, and pediatric dysfunctions.

Design

A post-hoc experimental design was used to compare the accuracy of treatment plan problem lists for two groups of subjects. One group viewed two videotapes of client-therapist interactions without a classroom-as-clinic format, and the other viewed the same videotapes in the context of a classroom-as-clinic format. The former group was composed of 82 first-semester senior students (1 man, 81 women) from the graduating classes of 1993 and 1994. Within this group, 1 man and 50 women were enrolled in the first author’s lab sections, and 31 women were enrolled in the second author’s lab sections. The classroom-as-clinic group included 45 first-semester senior students (4 men, 41 women) from the graduating class of 1995. Within this group, 3 men and 27 women were enrolled in the first author’s lab sections, and 1 man and 14 women were enrolled in the second author’s lab section. There were no significant differences in university grade point averages (GPAs) at graduation between the two groups, nor were there significant GPA differences between the lab sections.

There were no changes in course outlines or Level I fieldwork during the study. The classroom-as-clinic group had a different instructor in its sophomore year than the other group for a medical concepts course, and half the subjects in the class of 1994 had a different instructor for their introductory physical dysfunction course than did subjects in the classes of 1993 or 1995. Otherwise, course instructors were the same for all subjects.

Procedure

All subjects enrolled in the first-semester senior adult neurologic dysfunction course attended two 1.5-hour lectures and one 2-hour lab each week throughout the semester. The second author was the course instructor and an instructor for one lab section during the study period. During the same period, the first author was an instructor for two lab sections each year. Throughout the study period, subjects in this course engaged in two evaluation and treatment planning assignments that were based on videotapes of occupational therapy evaluations of actual clients with neurological dysfunction. These two assignments were spaced several weeks apart in the semester (i.e., subjects worked on only one videotape at a time). All subjects viewed the same videotapes, in the same order, during lab sessions. The videotape-related assignments were given after the subjects received didactic lecture material and reading assignments about the diagnoses being evaluated on the tapes. Videotape 1 was of a middle-aged man with a brain stem infarct, and Videotape 2 was of a young woman with TBI.

The videotapes were selected to provide a basis for treatment planning with adults with two types of neurologic disorders—cerebrovascular accident and TBI. Videotape 1 was made by a local rehabilitation center as an informational tape for future caregivers. Videotape 2 was created by the second author, in collaboration with occupational therapists from the same rehabilitation center, to be used for a treatment planning assignment in the adult neurologic dysfunction course. Each videotape provided a medical history, showed occupational therapists evaluating the client, and showed the client performing several self-care and functional mobility activities.

For each assignment, all subjects viewed the videotape in groups of 9 to 16, with a lab instructor present to answer questions and explain the rationale behind the evaluation techniques being used. Subjects were then given 2 weeks to write a treatment plan that included: (a) a list of client strengths, (b) a list of client problems, (c) a list of precautions to be observed in working with this client, (d) short-term and long-term objectives for each problem, (e) at least six different treatment activities for each client problem, and (f) setup and grading for each treatment activity.

The classroom-as-clinic group received preevaluation information about the clients 1 week in advance of viewing the videotapes and were given 1 week to work on preevaluation occupational therapy problem lists at home, with reference to their books and class notes. Preevaluation information included minimal diagnostic and social information for each client. For the client in Videotape 1, subjects were told that they would view a middle-aged man with a brain stem infarct who had been working as an executive and living alone before his infarct. For the client in Videotape 2, subjects were told that they would view a young woman who had sustained a TBI when she fell from a horse and that she had been working on a horse farm and living alone before her accident. Subjects in the classroom-as-clinic group were also given a checklist of occupational therapy problems derived from the Uniform Terminology (American Occupational Therapy Association, 1994) to guide the creation of their preliminary problem lists. These lists were not graded for accuracy.
The other subject group received neither advanced information about the videotaped client nor the occupational therapy problem checklist. Therefore, this group did not compile preliminary occupational therapy problem lists before viewing the videotapes.

Both authors graded the treatment plan assignments for their respective lab sections. They devised a postvideo problem list for each client on the basis of their combined clinical experiences and the information provided on the videotapes. For the problem list portion of the treatment plan, each author kept a frequency count that represented the percentage of correct problems the subjects recorded out of the list of expected problems for each client. This grading procedure was held constant for both study groups.

Data Analysis

Data were analyzed with two-way analyses of variance (ANOVAs), dummy variable regressions, and one-tailed paired t tests. Because this was an unbalanced design (unequal numbers in the study groups), dummy variable regressions were done to check the veracity of the ANOVA results (Hamilton, 1993). The dummy variable regression analyses corroborated the ANOVA outcomes, so only the ANOVA results will be reported. A significance level of $p = .05$ was used for all analyses to minimize the probability of Type II errors.

Results

Effect of Classroom as Clinic

A two-way ANOVA was done with the problem list data from each treatment plan (Hamilton, 1993), using teaching method (classroom as clinic vs. no classroom as clinic) and lab instructor as the independent variables and subjects' percentages of correct problems on their postvideo treatment plan problem lists as the dependent variable. For the Videotape 1 treatment plan (the man with brain stem infarct), there was a significant effect for teaching method, $F(1, 123) = 10.15, p = .0018,$ and for lab instructor, $F(1, 123) = 13.15, p = .0004$, but no significant interaction between teaching method and lab instructor (see Table 1). The subject means for the Videotape 1 treatment plan showed that the classroom-as-clinic group listed significantly more occupational therapy problems than the non-classroom-as-clinic group (see Table 2). The lab instructor means for the Videotape 1 treatment plan showed that subjects in the first author's lab sections were significantly more accurate than those in the second author's lab sections, with and without the classroom-as-clinic format (see Table 2). The lack of an interaction between group and lab instructor indicates that the classroom-as-clinic group performed significantly better than the other group in both lab instructors' sections.

For the Videotape 2 treatment plan (the young woman with TBI), there was no significant effect for either teaching method or lab instructor. However, there was a significant interaction between teaching method and lab instructor, $F(1, 123) = 3.99, p = .0480$ (see Table 3). Both groups performed similarly on this second problem list (classroom as clinic, $M = 82.9$; non-classroom as clinic, $M = 85.1$) (see Table 2). Likewise, subjects in the different lab instructors' sections performed similarly (first author, $M = 85.1$; second author, $M = 82.9$). The interaction can be seen in the significantly poorer performance, in the second author's sections, of the classroom-as-clinic group compared with the other group.

Effect of Practice

One-tailed paired t tests were done to compare the percentage of correct problems identified in the two treatment plans for both groups. The results showed a significant improvement in the accuracy of the second problem list ($p = .00005$) for the group that did not view the videotapes in a classroom-as-clinic format. However, in the classroom-as-clinic group, there was no significant difference between the accuracy of the first and second treatment plan problem lists (see Table 2).

Discussion

The results suggest that using a classroom-as-clinic format with client videotapes is more effective in improving students' diagnostic reasoning skills than using videotapes without this format in some situations, but not others. Moreover, the classroom-as-clinic format may confound the expected effects of practice on students' problem-identification performance.

Effect of Classroom as Clinic

The finding that subjects' diagnostic performance dropped when they viewed the client with TBI was similar to that reported in Neistadt's (1987) study. In both studies, subjects were given sketchy preliminary client information and told to think about the worst-possible scenario for each client in order to encourage the subjects to consider the total range of occupational therapy problems possible for a client with the given condition. In both studies, the clients with TBI had progressed to having relatively minor motor and cognitive problems. Clients with TBI who have relatively subtle motor and cognitive problems do not represent a worst-case scenario and, therefore, do not match the clinical images generated by students asked to think of such scenarios. In both studies, subjects' were less accurate in their problem lists when faced with this mismatch between clinical image and actual client. This
Table 1
Analysis of Variance for Treatment Plan 1

<table>
<thead>
<tr>
<th>Source</th>
<th>Partial Sums of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P&gt;F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>3646.38778</td>
<td>3</td>
<td>1215.46259</td>
<td>9.18</td>
<td>.0000</td>
</tr>
<tr>
<td>Teaching method (TM)</td>
<td>1344.27836</td>
<td>1</td>
<td>1344.27836</td>
<td>10.15</td>
<td>.0018</td>
</tr>
<tr>
<td>Lab instructor (LI)</td>
<td>1741.90868</td>
<td>1</td>
<td>1741.90868</td>
<td>13.15</td>
<td>.0004</td>
</tr>
<tr>
<td>TM*LI</td>
<td>35.7862289</td>
<td>3</td>
<td>35.7862289</td>
<td>0.27</td>
<td>.6042</td>
</tr>
<tr>
<td>Residual</td>
<td>16293.7067</td>
<td>123</td>
<td>132.46916</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1994.0945</td>
<td>126</td>
<td>158254718</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A performance drop suggests that these subjects were not able to change their original problem-sensing framework and, therefore, did not pick up cues about the clients' more subtle motor and cognitive problems. In this situation, the clinical image seemed to interfere with problem definition.

However, the clinical image can sharpen students' problem definition skills when it is close to the client's actual situation. In the current study, the instruction to think of worst-case scenarios for the client with brain stem infarct resulted in clinical images that were close to his actual situation. This client did have severe degrees of all the problems one might expect to be associated with his condition. Subjects' problem-sensing framework relative to this videotape was on target and helped them make more accurate observations than subjects who had not formed a clinical image before viewing the tape.

A conflict between clinical image and client situation does not appear to affect all students equally. For example, the entire classroom-as-clinic group showed less accurate problem definition (83%) for a client with subtle TBI problems than the subjects in Neistadt's (1987) study (88%). Additionally, for the client with TBI, classroom-as-clinic subjects in the second author's lab section showed less accurate problem definition (78%) than those in the first author's lab sections (85%). Differences in client contact and instructor styles may explain these differences.

Client contact. Classroom-as-clinic subjects did not meet an actual client; they did not have the opportunity to use interactive reasoning to get a sense of who this client was or to construct a real image of him or her. Students at UNH who view videotapes for treatment planning assignments often express frustration about not being able to ask the client questions or to do hands-on evaluation. In contrast, students in Neistadt's (1987) study met an actual client and had the opportunity to ask the client questions directly. They were able to use their interactive reasoning skills to modify their premeeting clinical images. The absence of actual interaction provides students with fewer opportunities to correct their preevaluation clinical images, to move from the confusion of a clinical image-client situation mismatch to a broader search for cues about client problems. However, the performance of classroom-as-clinic subjects in the first author's lab suggests that the interaction disadvantage of videotapes can be counteracted by an instructional style that includes modeling of problem naming, extra processing time, and specific feedback about student performance.

Instructional style. Classroom-as-clinic subjects in the first author's labs were not less accurate in their problem lists for the TBI client than the other group. Moreover, classroom-as-clinic subjects in the first author's labs came far closer to the 88% accuracy score of subjects in Neistadt's (1987) study than did the classroom-as-clinic subjects in the second author's lab (see Table 2).

The two authors took slightly different approaches to giving subjects feedback, both in lab and during office hours. In lab, both instructors directed subjects' attention...
to subtle client behaviors on the videotape, often stopping the tape and returning a portion of it to ensure that the subjects had seen the behavior in question. Both instructors also stopped and reran portions of the tape at subjects' requests and would freeze the tape as needed to field subjects' questions about what they were seeing. However, the first author explicitly named some client behaviors for subjects, whereas the second author would encourage students to generate possible labels for given client behaviors but not tell subjects which label was correct. For example, relative to a point in the tape where the client demonstrated slightly ataxic movements in one arm, the first author would say, "Did you see the difference in the movement between the two arms there? The left arm looks slightly ataxic." However, the second author might say, "Did you see the difference in the movement between the two arms? How would you describe the movement of the left arm?" After subjects generated several labels (e.g., hypertonia, tremors, weakness, ataxia), the second author would then ask the subjects to think about how they could decide which label was most appropriate. Hence, the first author modeled problem definition, whereas the second author tried to guide subjects to a definition with leading questions. The first author, therefore, spent about twice as much lab time viewing and discussing the videotapes compared with the second author.

In addition, the two instructors took different approaches to office hours where subjects could discuss their treatment plans before the assignment due date. The first author would tell subjects how many problems were expected for a given treatment plan and, when asked, would review subjects' preliminary problem lists and indicate whether those lists were complete, without saying which specific problems were missing. She would then look at the preevaluation occupational therapy problem checklist with the subject, asking him or her to consider which problems might be missing from the problem list. On the other hand, the second author did not tell subjects how many problems were expected and would not tell them whether their lists were complete. Instead, she would recommend that students evaluate their treatment plan problem lists on their own to be certain that all key items from the preevaluation checklist had been included. Hence, the first author gave the subjects more definitive feedback about their performance than did the second author.

These differences in instructor styles during lab and office hours may have accounted for the differential performance of the two instructors' classroom-as-clinic subjects on the treatment plan for the client with TBI. In the first author's lab sections, her problem naming (i.e., explicit labeling of client behaviors) may have helped subjects modify their original preevaluation images to yield more accurate problem lists. These subjects may also have been helped by the additional time spent viewing and discussing the videotape, which allowed them extra time to process and sort out their ideas about the client's occupational therapy problems and to construct a problem-sensing framework closer to her actual situation. In contrast, classroom-as-clinic subjects in the second author's lab section did not appear to be able to use her leading questions technique to accurately sense and name the client's problems. The more explicit feedback the first author gave subjects during office hours may have provided an additional check on subjects' distortions in problem sensing and naming for this client.

**Effect of Practice**

The finding that the non-classroom-as-clinic group showed a significant improvement in occupational therapy problem identification on the Videotape 2 treatment plan assignment compared with the classroom-as-clinic group may indicate a ceiling effect. The classroom-as-clinic group's score of 84.2% for the first treatment plan problem list is close to the other group's score of 85.1% on the second problem list (see Table 2). That is, the classroom-as-clinic group started at the level the other group achieved only after practice. Neistadt's (1987) study showed evaluation problem list accuracy scores of 88% after four classroom-as-clinic sessions with actual clients with neurologic dysfunction, suggesting that there is a limit to the diagnostic accuracy students can achieve without the intensive clinical experience of Level II fieldwork. The classroom-as-clinic group in the current study was close to that limit for their first treatment plan problem list, the other subject group did not come close to that limit until the second treatment plan assignment. This means that for the classroom-as-

<table>
<thead>
<tr>
<th>Source</th>
<th>Partial Sums of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>709.174413</td>
<td>3</td>
<td>236.391471</td>
<td>2.35</td>
<td>.0760</td>
</tr>
<tr>
<td>Teaching method (TM)</td>
<td>320.057718</td>
<td>1</td>
<td>320.057718</td>
<td>3.18</td>
<td>.0771</td>
</tr>
<tr>
<td>Lab instructor (LI)</td>
<td>346.651971</td>
<td>1</td>
<td>346.651971</td>
<td>3.44</td>
<td>.0660</td>
</tr>
<tr>
<td>TM*LI</td>
<td>401.747903</td>
<td>1</td>
<td>401.747903</td>
<td>3.99</td>
<td>.0480</td>
</tr>
<tr>
<td>Residual</td>
<td>12387.8492</td>
<td>126</td>
<td>103.946253</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13097.0236</td>
<td>126</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Implications for Occupational Therapy Education

The findings of this study suggest that in order to be truly effective when used with videotapes, the classroom-as-clinic methodology needs to be combined with explicit coaching in problem sensing and problem definition. That is, occupational therapy students need to be helped with clinical image building and describing and naming occupational therapy problems.

Problem sensing. Occupational therapy students are limited in their abilities to construct and modify preevaluation clinical images because they do not have a mental store of client images from clinical experience. Asking students to construct clinical images from course notes and textbooks helps them to apply didactic knowledge but does not prepare them for the process of rapidly modifying an erroneous preevaluation image during an evaluation. Client videotapes might be a useful tool in helping students to learn how to modify their clinical images. For instance, classroom-as-clinic subjects could view just the first few minutes of the client's tape and then rethink their preevaluation images before viewing the entire tape. In a lab situation, a group discussion facilitated by the lab instructor could be used to reshape students' clinical images. In this discussion, the lab instructor could model his or her thought process in forming clinical images.

Students could also be helped to build clinical images by keeping a journal or card file of client images during their Level I fieldwork experiences. Guidelines for writing a thumbnail sketch of clients could help students focus their observations. Such guidelines could ask for brief information about age, gender, relationship status, living situation, interests, education and vocational history, diagnosis, and occupational therapy problems for at least one client per Level I site visit. This procedure may help students build a catalog of clinical images that could be used for problem sensing in occupational therapy courses and Level II fieldwork.

Problem definition. Occupational therapy curricula also need to help students direct their attention to relevant cues and offer interpretations about what occupational therapy problems those cues indicate. Again, this can be done easily with videotapes as a first step in helping students to understand and name what they are seeing. The first author has found that students viewing client videotapes for treatment planning assignments often express anxiety about what to write down, about how to describe what they are seeing on the tape. Although these students can define all the occupational therapy terminology related to evaluation, they do not know how to use that terminology to describe and name their observations. Instructors need to model what is, for them, an automatic labeling process so that students can begin to see how occupational therapy terminology can be used to effect problem definition.

Conclusion

The productivity demands in today's health care environment require occupational therapy practitioners at all experience levels to be proficient at diagnostic reasoning. Therefore, occupational therapy academic programs need to facilitate the development of students' diagnostic reasoning skills. The results of this study suggest that using the classroom-as-clinic methodology with client videotapes can improve students' diagnostic reasoning skills when instructors also provide explicit tutoring in problem sensing and problem definition. This study further suggests that using this teaching method with videotapes is not as effective as using the method with actual client interviews. The use of videotapes in a classroom-as-clinic framework may be good student preparation for engaging in classroom-as-clinic situations with actual clients and may enhance the effectiveness of the latter. Further research is needed to test this hypothesis and to see whether the classroom-as-clinic method affects the diagnostic reasoning skills of students during Level II fieldwork and their first few years of practice. Because diagnostic reasoning is only one aspect of clinical reasoning, further research is needed to examine the possible expansion of this clinical simulation method to include coaching in other types of clinical reasoning. Occupational therapy education methods that foster holistic practice through the integration of all types of clinical reasoning best serve both occupational therapy students and their future clients. ▲

References


