

**STUDENT JOURNALS:
A WINDOW TO
METACOGNITIVE DEVELOPMENT**

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Abstract

A twelve week clinical practicum with a group of five first year nursing students provided an opportunity to introduce journal writing as a means of reflection on practice. The journals evolved into an on going dialogue between instructor and student. Although each student used the journal with varying degrees of comfort, evidence of developing metacognitive awareness was apparent in all five journals. As the students examined the thinking behind the decisions they made it was apparent to the reader that they used past experiences as well as previous and concurrent learning to create meaning and to find solutions to clinical challenges. This recognition of thinking processes translated into the students' acknowledgment of increasing comfort with nursing skills and with problem-solving challenges. Even though there had been no formal instruction in metacognitive processes, the students were demonstrating metacognitive growth in their journal entries. Metacognition, a means of shaping, clarifying, and discovering one's ideas, involves self-knowledge, theoretical knowledge, skill knowledge, and self-monitoring. The fact that metacognitive awareness was evident, even in the entries of learners new to the idea of keeping a learning journal, adds strength to the case in favor of journals -- as a teaching strategy, a diagnostic tool, an evaluation tool, a research method, and a tool for personal and professional development.

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I am also indebted to Dr. David Townsend who inspired me to "think-about-thinking" in my very first M.Ed. class in 1989. This opened the doors of opportunity and possibility for my own teaching/learning practice, and has remained a central theme in my M.Ed. studies.

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**Student Journals:
A Window to Metacognitive Development**

Critical thinking and decision making skills, widely accepted as survival tools for the challenges of nursing practice today and in the future, can be taught and developed, it has been suggested, through journal writing. Based upon this premise, an experiment was conducted with five nursing students to determine to what extent they could identify and write about the thinking behind their clinical actions and decisions. The resulting weekly written dialogue between the students (learning journals) and their instructor (feedback) was subsequently analyzed for evidence of cognitive activity. The findings indicated a level of thinking that superseded critical thinking and decision making or a combination of both. Thus, the journals were analyzed for evidence of metacognitive growth. Metacognition ranks as a higher-level thinking skill along with critical thinking and decision making, but goes a step beyond their scope by incorporating the concepts of self-knowledge, theoretical knowledge, skill knowledge, and self-monitoring as determinants of strategies chosen, goals set, and self-regulating activities. This paper provides a detailed explanation of the entire process: introduction to writing-to-learn, data collection (journals and feedback), and data analysis. Both quantitative and qualitative results will be reported and representative examples of metacognitive processes will be shared.

Background to Study

Traditionally student nurses have been educated and evaluated based on a model that tends to overemphasize analytic, rational, and quantitative skills while under emphasizing intuitive, creative, and wholistic thinking skills. Even though there is international recognition that nursing curriculum needs reform that would ensure the development of critical thinking and decision making skills in student nurses, nursing schools continue to resort to competency-based approaches (that specify particular learning objectives and methods and tend to limit intellectual development to minimum standards), drilled assignments (marathon activities beyond the limit of any lasting benefit other than, perhaps, to ingrain work values), and teaching/learning models that tend to be restrictive and reductive because they cannot predict or take into account the complexity of potential and actual realities (Lewis, 1990). Assessment of learning continues to occur primarily through multiple-choice exams (Royer, Cisero, & Carlo, 1993).

As a nurse educator, I have long been interested in alternate approaches to teaching/learning and, in particular, alternate methods of assessing student learning and student progress. For the past five years I have experimented with the use of learning journals as an adjunct to the clinical practicum at all levels of the nursing program. This most recent endeavor, the study of metacognitive development through learning journals, has augmented my faith in journals, not only as a teaching strategy for personal and professional development, but as a diagnostic tool that makes individualized student support possible, and as an evaluation tool to ascertain student adaptation and progress.

Literature Review

In order to accommodate the scope of the study, a literature search was conducted in three specific areas: (1) development of thinking skills, (2) use of journals to develop thinking skills, and (3) development of metacognitive skills. Much has been written on the first two subjects but there seem to have been few research studies to test or support the claims. The research conducted regarding the development of metacognitive skills often employed student journals as a means of data collection and, although emphasis on the development of thinking skills was not implicit in any of the metacognitive studies, thinking is an integral component of metacognitive processes.

1. Development of thinking skills

One research study examined the development of thinking skill. Wassermann (1986) challenged two separate classrooms of children with similar open-ended questions that were meant to inspire creative and original thinking. She pointed out "considerable differences between the various functions we label (as) thinking": (1) At lower cognitive levels "thinking exercises emphasize recall of specific information" or (2) comments that do "not require the creation of new ideas." (3) Thinking that "emphasizes planning and problem solving" is still not considered "excessively rigorous." (4) "Planning and problem solving in tasks of greater consequence ... (that) involves creation and implementation of "tasks, ideas, and strategies" ... and imply evaluation of the result "require higher-order functioning." (5) "At very high, sophisticated levels of cognition ... (thinking) calls for designing investigations, creating new schemes, and extensive original thinking" (p. 6-7).

Levels four and five of Wassermann's study would be comparable to metacognitive processes as described in this and other studies.

2. Use of journals to develop thinking skills

Two studies referred specifically to the use of journals to assist in the development of thinking skills. Bagley and Gallenberger (1992) studied the use of journals as a student-centered cooperative-learning approach with high school mathematics students. Daily journals were used "as a means of establishing connections by encouraging students to explore and write about various strategies for solving the same problem. " They concluded that "writing is more than just a means of expressing what we think; it is a means of knowing what we think -- a means of shaping, clarifying, and discovering our ideas" (p. 660). On the basis of the students' written responses, they found that teachers were able to improve their teaching methods. When Ridley, Schutz, Glanz, and Weinstein (1992) studied self-regulated learning in education undergraduates they found that their results could be divided into two processes: goal-setting and metacognitive awareness. Both of these processes are considered to be in the realm of metacognitive functions by those who have intentionally studied metacognition.

3. Development of metacognitive skills

Several studies focused specifically on the development of metacognitive skills. Alderman, Klein, Seeley, and Sanders (1993) analyzed the content of "learning logs" of preservice teachers enrolled in an educational psychology course. The categories examined were strategy use, goal-setting, self-monitoring, and attributions. Although it was not stated by the researchers, these four processes, which are generally agreed to be metacognitive processes,

seem to have directed the writing process. From their research several conclusions were drawn: (1) knowledge of the context or purpose of a strategy is critical to understanding the strategy; (2) the types of goals set were indicative of future achievements; (3) reports of attribution demonstrated the dynamics of a performance, and (4) because logs are a self-monitoring tool by nature they appeared to be a "powerful instrument for strategy improvement " (p. 52).

In research with grade eleven students, Groller, Kender, and Honeyman (1991) found that using an advance organizer (material that links what the learner already knows to what the learner needs to know) along with metacognitive strategies (being aware of one's thinking processes while reading, monitoring one's comprehension and one's plan of action while reading, and evaluating one's understanding when finished reading) helped students learn content more effectively. Miller (1987) studied the use of metacognition or self-monitoring strategies by fifth grade students. She concluded that self-instructional intervention may promote increased comprehension monitoring in above average readers. She focused on the promotion of inner speech to increase awareness of self-control of thought processes. This process she referred to as metacognitive acquisition.

Feathers and White (1987) deduced that "student journals can provide evidence that students are coming to metacognitive awareness ..." (p. 264). They analyzed the journal entries of freshmen enrolled in a developmental reading class and observed three types of comments: (1) comments on the task at hand, (2) comments on the application of a strategy to other subjects, and (3) comments on the general process of learning (p. 268). They concluded that

journal entries are useful as a means of studying the process of learning because they provide a view, not only of what students are doing, but of what they are thinking as well.

Purpose of Study

Journaling, as a teaching/learning strategy, has long been recognized as useful in the development of writing skills. Only more recently has journal writing been acknowledged for its potential in the areas of facilitating, not only learning, but the development of thinking skills, understanding, and discovery (Allen, Bowers, & Diekelmann, 1989). At the outset of this study, the intent was not to conduct "formal" research but to "experiment" with the use of learning journals as a means of promoting these very elements: learning, thinking, understanding, and discovery. Several months after completion of the "experiment" a decision was made to conduct in-depth analysis of the journal writing process in order to ascertain the degree to which the initial goal had been accomplished. Thus, the learning journals of the five participant students were analyzed to determine the degree to which metacognitive development was evident in their writing, and the degree to which metacognitive awareness increased over time. The purpose of the study must be viewed, therefore, in two stages. In the first stage, the purpose was to test the existing theory of "writing-to-learn" (Allen et al, 1989). In the second stage, the purpose was to examine the development of metacognitive awareness through journal writing and to develop a theory of writing-to-come-to-metacognitive-awareness.

Methodology

Subjects

Five first year nursing students, who had been randomly assigned to my clinical group, engaged in interactive journal writing for eleven weeks during a clinical practicum. Subsequently they agreed to allow their journals to be analyzed for evidence of metacognitive development. The subjects, three women and two men, ranged in age from early twenties to mid-thirties; the mean age was 29 years. Their backgrounds varied widely. For example, one subject was a fairly recent high school graduate while another was studying nursing as a second career. Although the inclusion of demographic differences (age, gender, and background) might have added an interesting dimension to the data analysis and interpretation, this was avoided to prevent comparison of subjects on this basis, as well as to protect privacy and to ensure confidentiality.

Following an explanation of the intent and purpose of the study, presented both in a letter and at a group meeting, each student signed and returned a consent form giving permission to use their journals in the study. Everyone accepted. Prior to the data collection phase of the study the subjects and the researcher were not acquainted. During the data collection phase, which lasted one semester, the subjects and the researcher had a variety of interactive opportunities: nine hours in the classroom (all five participated), out-of-class group tutoring in use of the Nursing Process (one subscribed), student feedback group for action research on the researcher's classroom practice (four volunteered), 112 hour clinical practicum (all participated), and individual office visits (all, by drop-in or appointment). For all the subjects, this was their first experience with keeping a journal for educational/learning purposes.

Materials

Upon receipt of project approval from the *Human Subjects Committee* the five participants were solicited for their consent. With the subjects' permission five student journals, that had been written one day a week over an eleven week period, were recalled and photocopied. This occurred nine months after the completion of the clinical experience and the journal writing project. Most of the journals were retrieved intact. Those that were incomplete still provided enough material to warrant analysis. A photocopy of all the summary comments written in response to the journals (herein referred to as instructor feedback) had been retained by the instructor at the time of writing, to double as anecdotal notes. The only missing instructor responses were those written in the margins of the unretrieved journals. The sum total of materials, once transcribed, included 824 lines of student journal and 707 lines of instructor feedback. The transcribed materials were then subjected to content analysis.

Procedure

Using an action research approach, five nursing students and their nursing instructor engaged in interactive journal writing over a period of eleven weeks. At the time this process occurred the intent was strictly educative. The decision to subject the results to critical analysis came several months later. The process will be outlined under four headings: (1) action research, (2) the interactive journal, (3) role of the students/subjects, and (4) role of the instructor/researcher.

Action research

Even though this did not start out as a "formal" action research project, in retrospect it was easy to identify the stages of action research as outlined by

Nolan and Grant (1993): diagnosing a problem, developing a plan of action, implementing the plan of action, and evaluating its effects.

1. Diagnosing a problem

There had been considerable debate within the nursing faculty regarding the merits and the proper use of student journals as an adjunct to clinical practicums. There seemed to be no clear understanding regarding the purpose or use of journals by nursing faculty and consequently, by nursing students. As a result of the confusion and discomfort there was rumor of a lobby to discontinue the use of journals in the clinical practicums.

2. Developing a plan of action

In an effort to prevent deletion of journals from the curriculum, I prepared a bag-lunch presentation, for nursing faculty, on the use of journals. This included a cursory literature review and a summary of my findings in support of journals.

3. Implementing the action plan

The research for the bag-lunch presentation gave me new insights into the use of journals and I immediately applied this new understanding with the clinical group that is presented herein. We were about to begin a new clinical rotation and I was able to introduce the concept of writing-to-learn to the subjects at a pre-clinical meeting and again at our first clinical post-conference.

4. Evaluating its effects

I was engaged in informal action research as I consistently used a feedback formula to inspire the students to think about their thinking and to write about their discoveries. At the time I did not realize that I was inspiring metacognitive awareness. Several months later, when I decided to analyze the journals and the

instructor feedback, I came to realize that the students and I had actually engaged in collaborative action research -- a cycle of planning, acting, observing, reflecting, and planning again while in the experience.

Retrospectively, I also recognized that the approach taken to this action research was a "technical collaborative approach" as I tested a particular intervention (the effectiveness of interactive journals) in a practical setting (the nursing practicum) (Holter & Schwartz-Barcott, 1993, p. 301). As with all action research, the emphasis was on involvement and collaboration of the researcher (nursing instructor) and the practitioners (nursing students) in diagnosing problems, designing action plans and implementing these actions. The immediate goal was to create a change in practice -- the way journals were viewed and used. By engaging in analysis of the journals, the ultimate goals became to support an existing theory (writing-to-learn) and to propose a new theory (writing-to-come-to-metacognitive-awareness) (Holter & Schwartz-Barcott, 1993).

The interactive learning journal

The interactive journal¹ is defined by Heinrich (1992) as a written dialogue between the subject (student) and a chosen audience (in this case the nursing instructor). Inherent in the concept is: (1) continual exchange of information, (2) acting on one another, and (3) mutuality or reciprocity (Webster's, 1988). Hurtig, Yonge, Bodnar, and Berg (1989) recommend the interactive journal as a clinical teaching tool. They define the interactive journal as "a daily record of the student's ideas, feelings, actions, and reactions that relate to a nursing practicum. The teacher responds to these entries, creating ... an interaction between student and teacher" (p. 17). The word "learning" was added to the

name of this dialogical medium in order to make a distinction between a private and personal journal and a journal used for educative/ learning purposes.

The subjects were introduced to the writing-to-learn concept (see Appendix A) at a pre-clinical conference and again at their first clinical post-conference. They were encouraged to think-about-thinking -- to identify their thought processes as they reflected on their clinical day. The instructor/researcher responded to each journal in writing within three days. Each journal was treated as a professional private conversation between the instructor and the learner.

Role of the students/subjects

What was required of the subjects was an effort to write reflectively and analytically (examining the thinking behind their decisions) once a week, as soon after their clinical experience as possible. The journal was to be submitted to the instructor within 48 hours. The subjects were provided with a range of approaches that could be used to inspire their thought processes for journalling. Although there was no intent to restrict the journal writing, there was a need to identify this as primarily a learning journal that would focus on thinking skills. Students were told they could write in whatever style they chose but were asked to reflect on their nursing practice and their application of classroom theory. They were also provided with topics and, on one occasion, a visual stimulus to take away the pressure of self-inventory.

1. Reflection on practice

Instruction regarding introspection and reflection on clinical practice directed the subjects to reflect intentionally on their own experience in the practicum and to recognize the integration of personal experience with

concurrent and previous classroom learning. They were asked to describe events as perceived through their eyes, to relive feelings and emotions associated with events, and to reflect and relate each experience to other experiences in order to understand the impact on their practice. Later in the practicum, reflection on earlier journals was suggested to provide insights to personal and professional growth.

2. Application of theory

The subjects were asked to identify how prior and concurrent learning contributed to or changed the meaning of a situation. This might have included specific lecture material, readings, laboratory experience, post-conference exercises, or clinical learning. In other words, they were asked to link their learning with their clinical decision-making.

3. Response to a topic

Content specific topics were developed to help those subjects who anticipated difficulty with starting to write. The topics, in this case, were all related to the theory being covered in the classroom during the semester (see Appendix B for examples of topics). This approach, in particular, was used to relieve the burden of daily self-inventory. Topics were not, however, meant to dictate the journalizing process.

4. Response to visual stimuli

Early in the practicum experience (about week four), as a post-conference exercise, the subjects were asked to study a pen and ink drawing of a rose (see Appendix C) and to write a response. Voluntary participation in sharing responses followed (see Appendix D for examples). This activity, which

included both instructor and student self-disclosure, was intended to inspire trust and increased freedom of expression.

Role of the instructor/researcher

The facilitative role of the instructor/researcher in the interactive learning journal played an integral role in the entire process. The first and most important challenge was to create a non-threatening environment (of mutual trust) in which the subjects would be comfortable to dialogue freely. The second challenge was to inspire the subjects to share their reflections on learning and thinking in a written format. Several measures were taken to develop comfort, inspire trust, and to promote reflective writing. These will be presented briefly.

1. Clear instructions

At the outset it was important to be explicit about why the subjects were being asked to keep a journal, to indicate what they were supposed to do, and to demonstrate how to organize and develop their journal. When I introduced the use of journals I followed the guidelines designed by McAlpine (1992). First I explained that intentional reflection plays a role in the development of an integrated professional practice and that writing helps the professional to be intentional about the process. Then I suggested a variety of approaches to journal writing, indicating that they could include descriptions, emotional reactions, and reflections. The writing was to be free-flowing requiring no concern for form and structure and requiring no rewrites. The only thing I added to McAlpine's suggestions was that they include some indication of thinking-about-thinking. I suggested that writing occur as soon after clinical as possible, be legible, and on loose leaf paper for easy removal. Finally, I

explained that my role would be to give direction and feedback to assist with the integration of learning and the derivation of meaning from practicum experiences, as in a mentoring relationship.

2. Demonstration of self-disclosure

Because students feel extremely vulnerable (Cameron & Mitchell, 1993), instructor self-disclosure was necessary to facilitate learner self-disclosure (Heinrich, 1992). Most sources suggest the instructor keep a journal along with the students. I was, in fact, keeping a journal as I was coincidentally conducting action research on my teaching practice in the classroom. Four of the five clinical students, subjects in this study, were voluntary members of a student feedback group that met with me weekly to dialogue on my classroom teaching practice. They each received a copy of my weekly journal reflection on my classroom practice. Although it was not a journal directly related to the clinical experience, it did, in fact, involve much introspection and identification of ongoing adaptations.

Week by week I went through the painful process of analyzing and critiquing my videotaped classes. Each journal entry included reflections on the class (e.g. what worked and what needed to be changed); goals for subsequent classes; correlations with previous and current learning/reading regarding: adult learners, classroom diversity, learning styles, development of thinking skills; and so on. Sharing my own vulnerability through journal writing may have helped to reduce student skepticism about sharing, for at least four of the five students in this study. Because the members of the clinical group in this study shared a strong bond, I suspect the fifth student, although not a member of my action research feedback group, was also privy to the content of my

journals. (The entire journal related to the action research project is included in the Independent Study: One Practicum: Multiple Applications.)

3. Demonstration of thinking processes

"Think-aloud" is a technique that requires individuals to verbalize the thought processes and strategies they are using to tackle a specific problem-solving situation (Whimbey & Lochhead, 1986 cited in Short & Weissberg-Benchell, 1989). From the beginning of the semester I had been consciously using the think-aloud approach in the classroom, in clinical post-conferences, and in one-to-one interactions with the subjects. This approach resulted in joint problem-solving -- as we talked we devised answers and solutions together.

4. Written feedback

Written feedback to the student journals consistently followed a simple formula that was adopted from McAlpine's (1992) work. Three types of responses were consistently and exclusively used: vision, challenge, and support (Appendix E). Vision responses were based upon my ability to see where the learner was going and sometimes involved providing further insight or referring the subject to additional resources. Challenge responses were meant to create "cognitive dissonance" to make the learner think. Additionally, if entries were too brief probing questions were used; if the entries were restricted to generalities, the subjects were directed to be more specific. Support comments involved ongoing positive psychosocial reinforcement that confirmed the learner's worth. These responses had the potential to increase self-esteem and, ultimately, the individual learners' potential.

The feedback was, of necessity, detailed and descriptive, as well as individualized to each subject's unique needs and experiences. This took a lot

of time but I followed the suggestion of Hurtig et al (1989) and used journal feedback to replace traditional anecdotal notes kept on each student in a clinical practicum. As suggested in the literature (Bagley & Gallenberger, 1992; Hahnemann, 1986; Heinrich, 1992; McAlpine, 1992), short positive comments were used to encourage the subjects to continue writing or to redirect their thinking. Negative, critical, and judgmental responses were avoided. I consciously responded to the content rather than the mechanics. All of my responses were written in pencil or in a color other than red (usually green).

5. Adaptations

Although the intent was to have each subject submit a journal every week for eleven weeks, a slight variation in the approach had to be implemented to meet the individual needs of the students. Significant differences in journal content and in the apparent comfort level of the subjects with writing a journal led to temporary employment of an alternate approach. Week four of the clinical practicum the subjects were offered a choice to write a journal or to engage in think-aloud (dialogue) in my office for half an hour the day following clinical. Four of the five participants opted to think-aloud -- one subject participated in oral dialogue once and went back to journalizing, another participated twice, and two subjects chose think-aloud over journalizing on three occasions. By week seven all of the subjects had agreed or chosen to return to written dialogue. I continued to respond in writing to all think-aloud sessions just as I would respond to a journal. When the subjects returned to writing there seemed to be a new freedom of expression.

Interestingly, my choice to adapt to think-aloud is supported in the literature. Ridley et al (1992) reported that both think-aloud verbal protocols

and self-report assessments of behaviors can be employed as indicators of metacognitive awareness. Thinking aloud is equally, if not more, effective as a means of identifying variations in problem solving methods and alerts unsuccessful problem solvers to weaknesses in their reasoning processes (Holbert & Abraham 1988). The situational interview is a reliable method for collecting information (Kraiger, Ford, & Salas, 1993).

Other minor adaptations included designating five to ten minutes of clinical post-conference time for journal writing and on one occasion the subjects agreed to exchange journals with another member of the group for peer feedback prior to instructor feedback.

Data Coding and Analysis

Using *Microsoft Word for Windows* all student journals and instructor feedback was transcribed verbatim and a "hardcopy" was generated. The transcriptions were read and reread to identify themes and related categories. Coding was done by hand. Initially each line was coded in the margins with a letter designation. Later, when categories and subcategories became apparent, a color coding system was employed to indicate related data.

A triangulation approach, employing both quantitative and qualitative methods, was used to analyze journal entries and instructor feedback. Quantitative analysis was based on the number of transcribed lines dedicated to an action or thought. Charts were developed to provide a visual representation of these results. Totals, means, and percentages were generated. Qualitative analysis of student journals resulted in identification of two main categories and eleven subcategories. Some of these categories were very similar to those identified in the education and nursing literature.

The first stage of qualitative analysis involved identification and naming of subcategories. Alderman et al (1993) had identified four categories of writing in learning logs: strategy use, goal-setting, self-monitoring, and attributions. Kraiger et al (1993) used three general classifications to evaluate learning outcomes: cognitive, skill-based, and affective (including attitudinal and motivational). Ridley et al (1992) divided their findings into two processes: goal-setting and metacognitive awareness. Feathers and White (1987) identified three types of journal comments: (1) comments that focused on the task at hand; (2) comments that focused on application of a strategy; and (3) comments that focused on the general process of learning. Some of the data in this study matches well with the descriptions and classifications used in previous studies and therefore very similar subcategory classifications for metacognitive processes emerged: strategies, goal-setting, self-monitoring, causal attributions, affectively-based learning, and metacognitive awareness.

The work of Royer, Cisero, and Carlo (1993), Thomas and Bain (1982), and Feathers and White (1987) helped me to find terms to describe sets of reported activities that, despite falling outside the realm of metacognitive development, must be recognized as precursors to higher level activities and thinking processes. These I classified as tasks, knowledge, skills, application, and process.

From the composition of the sub-categories emerged two distinct levels of journal content. Royer et al (1993) spoke of "basic capacities" (or general capabilities), "controlled or automatic cognitive skills" (capable of being transformed), and "higher cognitive skills and capacities" (responsible for goal-setting and planning of cognitive activity) (p. 203). Thomas and Bain (1982)

referred to "surface approaches" (reorganizing new data while learning) and "deep strategies" (active assimilation and accommodation to integrate new knowledge with prior knowledge) (cited in Worrell, 1990, p. 171). I chose to

Table 1: Summary of Activities and Processes Identified in Student Journals

Descriptive Label	Distinguishing Characteristics
<u>Surface Activities</u>	Non-complex actions or events
Tasks	Comments on a piece of work
Knowledge	Demonstration of facts and basic information
Skills	Evidence of use of knowledge, understanding, and judgement
Application	Reflections on how knowledge and skills were used
Process	Description of a course of action
<u>Metacognitive Processes</u>	Conscious monitoring of complex activities and thought processes
Strategies	Demonstration of the range of mental activities involved in knowledge acquisition and application.
Goal-setting	Identification of an end or an object that one strives to attain
Self-monitoring	Evidence of modification of activity, behavior, or consciousness through self-evaluation, self-regulation, and self-reinforcement
Causal Attributions	Perceived causes of success or failure
Affectively-based learning	Learning outcomes that arise from feelings or emotions that evoke a reaction or a change in action, thought, nature or behavior
Metacognitive awareness	Reflective thinking that demonstrates self-awareness, knowledge awareness, task awareness, and strategy awareness

devise two broad categories: surface activities (reports of non-complex actions) and metacognitive processes (involving integration of self-knowledge and task knowledge with strategy knowledge and ability).

In the final analysis, surface activities included five subcategories: tasks, knowledge, skills, application, and process; and metacognitive processes included six subcategories: strategies, goal-setting, self-monitoring, causal attributions, affectively-based learning, and metacognitive awareness. Table 1 provides a compilation of the categories and subcategories and a brief definition of each.

Qualitative analysis of the instructor feedback was based on the pre-determined response formula: vision, challenge, and support. A fourth category, general comments, was devised to accommodate the feedback comments that fell outside the response formula. Table 2 provides a brief description of each type of instructor feedback.

Table 2: Summary of Instructor Feedback Responses

Descriptive Label	Distinguishing Characteristics
Vision	Insights to where learner is going
Challenge	Creation of "cognitive dissonance" by posing questions and other ways of thinking
Support	Provision of positive reinforcement that confirms the learner's worth

Results

Both quantitative and qualitative data will be reported to demonstrate the outcomes of this study. The initial goal of the study had been to increase the quantity and the quality of the journal entries. Quantitative data helps to demonstrate the increase in journal content over time as well as the possible influence of instructor feedback on the process. Qualitative data helps to demonstrate the nature of the interactions and the apparent metacognitive processes.

Increase in Student Journal Content Over Time

Brevity was the operant mode for the first journals so the initial challenge was to inspire deeper reflection and freer expression. This indeed seems to have been accomplished. Overall, across the eleven week period of journal writing, there was a significant increase in the total number of transcribed journal lines from one week to the next (see Table 3).

An estimate of volume increase was attempted taking four different viewpoints (see Table 4). A comparison between week one and the longest journals showed such an overwhelming increase (mean 526%) that a comparison was calculated between week two (after the subjects had the benefit of instructor feedback to their first journal) and the longest journals. The result was still very high, a 248% increase. Comparisons were also made between week one and the average of subsequent journals (308%), and week two and the average of subsequent journals (152%). This final figure is probably the most representative of the increase in volume of journal writing over time.

Table 3: Number of Lines in Transcribed Student Journals

	Student				
	#1	#2	#3	#4	#5
Week 1	4	5	16	8	8
Week 2	11	10	28	21	16
Week 3	6	5	50	17	19
Week 4	17	*	17	13	*
Week 5	*	*	49	*	*
Week 6	**	*	37	*	*
Week 7	19	***	55	17	***
Week 8	21	**	90	24	**
Week 9	15	13	**	23	20
Week 10	23	***	28	24	8
Week 11	8	47	32	****	****
Total	124	80	402	147	71

Codes: * Think-aloud session instead of journal
 ** Absent from clinical
 *** Journal incomplete or not available
 **** Declined to write after final clinical day

Table 4: Percentage Increase in Number of Lines

	Student					
	#1	#2	#3	#4	#5	Mean
Week 1 to longest journal	575%	940%	563%	300%	250%	526%
Week 2 to longest journal	209%	470%	321%	114%	125%	248%
Week 1 to average of subsequent journals	375%	450%	268%	249%	198%	308%
Week 2 to average of subsequent journals	142%	267%	160%	94%	98%	152%

Metacognitive comments were consistently higher than reported surface activities from day one when they represented 74% of the journal content (see Table 5). Averaged over the eleven weeks, 32% of the transcribed lines were coded as surface strategies and 68% of the transcribed lines were coded as metacognitive processes.

Table 5: Content Analysis of Student Journals

	Week											Total	%
	1	2	3	4	5	6	7	8	9	10	11		
T	5	3	1				1	4	7			21	4
K	1	4	7			1	3	1	2		1	20	4
S	1	1	9	2	2	2	1	1	3	2	1	25	5
A		7	6	1	2		2	9	4	15	4	50	11
P		1	6	4			3	24				38	8
ST			1							9		10	20
G-S		8	6	2		1	1	1	1	2		22	5
SM	10	7	16	6	5	5	19	14	8	7	10	107	23
AT		3	3	3	2	1	2	1			5	20	2
AF	10	16	3	7	3	3	9	6	2	4	2	65	4
MA		3	5	6	18	9	11	20	2	8	13	95	14
Total	27	53	63	31	32	22	52	82	29	47	36	473	100

Total Surface	7	16	29	7	4	3	10	39	16	17	6	154	32
Total Metacog	20	37	34	24	28	19	42	42	13	30	30	319	20
% Surface/ Metacog	<u>26</u> 74	<u>30</u> 70	<u>46</u> 54	<u>23</u> 77	<u>13</u> 88	<u>14</u> 86	<u>19</u> 81	<u>48</u> 51	<u>55</u> 45	<u>36</u> 64	<u>17</u> 83	<u>33</u> 67	<u>32</u> 68

Codes: Surface Activities

T **Tasks**
 K **Knowledge**
 S **Skills**
 A **Application**
 P **Process**

Metacognitive Processes

ST **Strategies**
 G-S **Goal-setting**
 SM **Self-monitoring**
 AT **Attribution**
 AF **Affective**
 MA **Metacognitive awareness**

Correlation Between Student Journals and Instructor Feedback

Instructor feedback was similarly charted (Table 6) and was then quantitatively compared with the number of transcribed lines in student journals (Table 7). The mean percentage of lines of instructor feedback compared to the number of lines in the student journals (based on a comparison only when a journal existed), interestingly, is 99.2%, almost equal to student production.

Table 6: Number of Lines in Transcribed Instructor Feedback

	Student				
	#1	#2	#3	#4	#5
Week 1	7	9	12	7	7
Week 2	10	13	17	14	18
Week 3	6	9	17	12	9
Week 4	13	*11	12	14	*11
Week 5	*25	*14	16	15	*9
Week 6	**	*13	19	14	*8
Week 7	16	10	22	***	10
Week 8	24	**	30	***	**
Week 9	23	28	**	23	23
Week 10	18	8	29	36	8
Week 11	3	21	14	*****	*****
Total	145	136	188	135	103

- Codes: * Think-aloud session instead of journal
 ** Absent from clinical
 *** Journal incomplete or not available
 ***** Declined to write after final clinical day
 Note: Written feedback was provided after think-aloud sessions as well

Written feedback to three students was virtually equivalent to their journal length. One student (#3) received half as much feedback as the journal length; another student (#2) received 50% more feedback than the journal length. In retrospect these differences were directly related to the nature of the respective

student journals. The subject who received proportionately less feedback had prior experience with keeping a personal diary and was, therefore, accustomed to reflection and introspection. Proportionately more feedback was given to the other subject who had an inclination to brevity and generalities. The extra feedback to student #2 did result in longer entries near the end of the experience.

Table 7: Instructor Feedback as a Percentage of Student Journal Length

	Student				
	#1	#2	#3	#4	#5
Week 1	175%	180%	75%	88%	88%
Week 2	90%	130%	61%	67%	113%
Week 3	100%	180%	34%	71%	47%
Week 4	76%		71%	108%	
Week 5			33%		
Week 6			51%		
Week 7	84%		40%		
Week 8	114%		33%		
Week 9	153%	215%		100%	115%
Week 10	78%		104%	150%	100%
Week 11	38%	45%	44%		
Mean	101%	150%	55%	97%	93%

Overall Mean: 99.2%

Note: Comparison only occurred when a journal existed

Blank spaces indicate no journal and/or feedback

Content Analysis of Instructor Feedback

Instructor feedback was analyzed and charted to reflect the categories of feedback formula -- vision, challenge, and support -- with the addition of a

fourth category called general comments for anything that did not fit into the first three (Table 8).

Table 8: Content Analysis of Instructor Feedback

	Student					
	#1	#2	#3	#4	#5	Overall Totals
W1	0-0-7-0	0-0-9-0	0-1-11-0	0-0-7-0	0-0-7-0	0-1-41-0
W2	3-2-1-4	0-7-2-4	2-8-17-0	0-9-3-2	0-9-4-5	5-35-29-15
W3	0-5-0-1	0-9-0-0	6-4-4-3	2-5-5-0	4-1-4-0	12-24-13-4
W4	3-5-5-0	*0-3-8-0	2-4-6-0	1-8-5-0	*0-0-8-4	6-20-32-4
W5	*0-0-20-5	*0-2-10-2	5-0-11-0	*0-15-0-0	*0-0-7-2	5-17-37-9
W6	**	*0-2-10-1	5-5-9-0	*4-0-10-0	*0-0-8-0	9-7-37-1
W7	1-13-0-2	0-4-6-0	4-2-15-1	***	5-0-5-0	10-19-28-3
W8	7-12-5-0	**	4-0-26-0	***	**	11-12-31-0
W9	1-16-6-0	6-19-1-2	**	3-16-4-0	4-5-14-0	14-56-25-2
W10	0-0-18-0	0-0-8-0	20-2-7-0	5-11-20-0	4-0-4-0	29-13-57-0
W11	0-1-2-0	2-0-19-0	3-6-5-0	****	****	5-7-26-0
Totals	15-54-84-12	8-46-73-9	51-32-111-4	15-64-54-2	17-15-61-11	106-211-356-38
% of each	9-33-51-7	6-34-54-7	26-16-56-2	11-47-40-1	16-14-59-11	15-30-50-5

Code: Ordering of numbers indicates nature of response
 Vision - Challenge - Support - General

- * Responses to think-aloud instead of journal
- ** Absent
- *** Feedback not retrieved
- **** Opted not to write

Interestingly, 50% of the feedback responses were coded as supportive. Supportive comments initially helped to alleviate fear of the unknown associated with writing for an unfamiliar nursing instructor. Continuation of the supportive element in feedback comments seemed to inspire reluctant subjects to more prolific entries. Student #3 received more visionary comments

(26%) and fewer challenge comments (16%) than most of the subjects. This was again attributed to the subject's comfort with writing introspectively without prompting. Student #4 received a proportionately higher number of challenge comments (47%), whereas student #5 received a low number of challenge comments (14%). In reviewing these results, there is no better explanation of the differences than the fact that instructor feedback was contingent upon subject input.

Qualitative Analysis of Student Journals

Activities and processes identified during data analysis were classified under two broad headings: surface activities and metacognitive processes.

Representative examples from each of the categories will be shared. In each case a quote from a student journal or instructor feedback will be followed by two numbers, separated by a colon, and enclosed in brackets. The first number will indicate the subject; the second number will indicate the clinical week. Patients mentioned in the journals are identified by initials only. Although some of the areas reported represent less than 5% of the overall journal content they depict distinctly different concepts that could neither be amalgamated nor ignored.

Coding and reporting journal entries as distinct entities or pure elements herein was not meant to give a false impression that any of the processes can stand alone. There is considerable overlap and interplay between and across processes. Although this is difficult to demonstrate when distinct elements are being reported, it is hoped that the reader will get a sense of the

interconnectedness of surface activities with metacognitive processes and, especially, the interconnectedness of metacognitive processes within and among themselves.

Surface Activities

Journal entries that were categorized as surface activities involved reports of non-complex actions or events that likely occurred as automatic or subconscious cognitive processes (Bondy, 1989). These were coded as tasks, knowledge, skills, application, and process. Overall, surface activities accounted for 33% of the transcribed journal content (refer back to Table 5).

Tasks

A task is a piece of work assigned to or demanded of a person (Webster's, 1988). Comments about nursing tasks totaled 21 lines or 4% of the overall attention in student journals (Journal Sample 1). Some of the tasks reported had to do with reviewing events associated with the care of an assigned patient. Other tasks reported had to do with subjects' participation in the routines of the workplace -- which they tended to use as a measure of their own "usefulness."

Journal Sample 1: Comments Re: Tasks

I helped in one room taking pulse and (respiratory) rate (1:7)

I did vitals for a post myelogram patient, passed along stat lab results & relieved a staff member of her task while she attended to action re: lab results (3:7).

I had my a.m. care finished and vital signs finished by coffee time. Usually I still had a bath to do after coffee and some vital signs (1:8).

Mr. A. with (physiotherapy's) assistance walked to door to bathroom and then (student nurse) assistance from (bathroom) to bed (2:9).

Knowledge

Knowledge refers to the subjects' ability to recognize and recall basic information (Roberts & Clifton, 1992). It is understood that factual information will gradually be transformed into a procedural form that can be applied with minimal conscious reasoning (Royer et al, 1993). Demonstration of facts and information, as well as demonstration of the means of knowledge acquisition, accounted for 4% (20 lines) of the transcribed journals (Journal Sample 2).

Most of the entries coded as knowledge indicate an attempt to connect textbook information with a clinical situation. For example, in one entry the subject assessed the patient's learning needs and then taught him accordingly (2:2). Another subject demonstrates an attempt to connect pre-clinical research findings with the actual clinical picture (5:3). The final example in this sample identifies how knowledge was acquired by tapping into the client's knowledge and understanding of a procedure (3:7).

Journal Sample 2: Comments Re: Knowledge

She is unaware of the increases (in function) herself so telling her is helping her esteem (1:8).

Asked patient if he was taught / told what an IVP would involve. Told Mr. D. they would be injecting him with a contrast dye in x-ray, may feel strange sensations, hot, strange taste, etc. and they would be taking pictures as the dye went through him. That the procedure would take about 1 hour. Mr. D. appeared satisfied with explanation (2:2).

I can see so much improvement in my patient this week. She has a lot more control of her upper body. She sure has gained a considerable amount of strength since last week. She is still quite frustrated and feels discouraged but

her mood has improved since last week. She smiled at me a number of times, which she did not do last week. The thing that most surprised me about her condition is the "burning" feeling she has in her feet. From the reading I did I thought she would not have any feeling below her waist (5:3).

I was able to honestly seek the patient's help (with the urostomy appliance). He had no problem with my lack of knowledge and presented an "informative inservice" (3:7).

Skills

Skill refers to an art, craft, or science involving the use of the hands or the body and includes knowledge, understanding, and judgment (Webster's, 1988). Knowledge in a skill area can be translated into a set of procedures that are applied more or less automatically (Royer et al, 1993). Skills identified in the journals focused on the development and use of assessment skills, communication skills, time management skills, and so on. They represent 5% (25 lines) of the transcribed journal entries (Journal Sample 3).

Journal Sample 3: Comments Re: Skills

I know the importance of a "good conversation" between 2 people to build trust but it was neat today to see how easily C. and I developed a comfortable relationship within a very short space of time (3:6).

I do know that I use humor when establishing a rapport with staff, patients or family (4:10).

I found it a lot different when you have to work with a patient's family. You not only have to accommodate the patient but also the family (5:2).

I did manage to get most everything done today ... I think that by improving my assessment skills ... my time management (will improve) (4:4).

Application

Application, the demonstration of how knowledge and skills are used (Webster's, 1988), requires the subject to transfer abstract concepts and principles into appropriate nursing behaviors (Roberts & Clifton, 1992, p. 178). Eleven percent (50 lines) of the transcribed journal entries described the method used to accomplish an assignment. These included conscious reference to: (1) application of learning from the classroom, (2) application of learning from the research completed in preparation for the assignment, and (3) application of learning from the clinical setting (Journal Sample 4).

Journal Sample 4: Application of Learning

I (have) seen a big change in her mental status. She remembers more (me) and she is more alert (1:9).

Nursing Process, believe it or not! I record what has happened, analyze the problem, set my goal and plan action or nonaction. My evaluations are usually ongoing, some I set time limits on. I hadn't particularly realized the similarities until reviewing my daily journal (3:8).

As I talked to her during the day regarding what she was going to do about her living arrangements once she is discharged, I became aware that I was using some of the communication skills we learned in (communication class). It was gratifying to realize I was using those skills without having to consciously try (4:2).

I find I am a lot more conscious of how I move my body when I lift someone than I used to be (5:3).

Process

Process involves a description of the steps or operations in a course of action (Webster's, 1988). Description of nursing actions represented 8% (38 lines) of the transcribed journal entries (Journal Sample 5). The first example demonstrates how the subject discovered that the patient is an excellent resource (1:4). This subject had inferred a goal "to listen more" in an entry two weeks earlier so was also able to indicate movement toward the accomplishment of that goal. In the next example, the subject demonstrates two things: how a conversation with a patient evolved, and the process behind goal-setting (a phenomenon which will be discussed as a metacognitive process) (3:3). In the final example, the subject demonstrates a decision-making process by talking through the events of morning care (4:8).

Journal Sample 5: Comments Re: Process

Most of the time a patient knows what works for them or makes them feel better. This is one thing I learned from S.P. Interacting with S.P. had good benefits. She likes to talk about her diabetes and have someone interested listen. She could tell me what she knew was wrong with her and how she handled it. I also learned a lot from her about diabetes, and its complications, and about the feelings that go along with learning a person has an incurable disease (1:4).

She and I discussed the nature of her disease and she is comfortable discussing the topic. She is well aware of the outcome and verbalized that she is ready when the day comes for her to die. ("Hopefully I won't have too much pain"). I asked her re: her feelings about death and she stated that she wasn't afraid. On the subject of pain control, she hinted that pretty soon she may need 3 Tylenol instead of 2. She was going to mention it to the doctor when she saw him. She also verbalized that "she might try asking for Tylenol sooner before the pain got too bad". I encouraged her to try that. ... The vast changes in my patient's lower legs in one week surprised me. I was aware that skin damage can occur easily (especially in one with the diagnosis and health status as my patient) and

deteriorate rapidly but to actually see the evidence myself has definitely made an impact on me. I resolve to pay particular attention to the demands that ADLs (activities of daily living) and bedrest (as well as her health status) put on the integrity of her skin (3:3).

My patient was discharged today. Before she left I expressed my appreciation for her cooperation over the last two weeks of our relationship. I also asked her if she had any questions or concerns regarding our relationship. We also talked about the goals that have been set regarding her diabetes. She assured me that she would watch her diet and maintain her medication schedule. With the end of our conversation our nurse / patient relationship was terminated (4:3).

*Today was a real learning experience in clinical. The first thing that I learned was, that nurses have to make some important decisions with regard to how much time will be spent with each assigned patient. This **prioritizing** of patient care was made somewhat clearer to me when I was required to (do) it. Both the patients that were assigned to me were, according to their charts, experiencing some emotional difficulties. Both were also in need of nursing assistance with many of their ADLs. After helping both with their morning care and baths, I made the decision that Mr. K., psychologically, was in more urgent need of my attention than Mr. H was. I came to this decision after talking with both men as we went about their morning care. At that time it became apparent to me that Mr. H. was feeling fairly good about himself, at least at this point, as he had set some goals for his physio and was looking forward to achieving them; whereas, Mr. K. was confused and disoriented and so I decided to spend extra time with him (4:8).*

Metacognitive Processes

Journal entries that were coded as metacognitive processes involved more complex activities and thought processes. Inherent were the elements of higher level thinking and conscious monitoring. Many writers have contributed to the understanding of what constitutes metacognition². Royer et al (1993) provide a comprehensive definition:

Metacognitive skills are cognitive activities that allow an individual to reflect on and to control performance in a useful and efficient manner.

Skilled performers possess the capability of planning their activity, monitoring the success or failure of their own activities, and altering behavior in accordance with the monitoring activity (p. 208).

Basic skills of metacognition include: (1) predicting the consequences of an action or event, (2) checking the results of one's own actions (did it work?), (3) monitoring one's ongoing activity (how am I doing?), (4) reality testing (does this make sense?), and (5) a variety of other behaviors for coordinating and controlling deliberate attempts to learn and solve problems (Brown & DeLoache, 1978 in Roberts & Clifton, p. 234).

Overall, 68% of the transcribed lines of student journals were coded as metacognitive processes (refer to Table 5). They have been sub-divided into strategies, goal-setting, self-monitoring, causal attribution, affectively-based learning, and metacognitive awareness. None of these categories functions independently. There is considerable interaction among and between categories in order to accomplish the overall metacognitive result. This must be kept in mind even though the results are reported in distinct categories.

Strategies

Strategies refer to the process involved in planning and managing nursing care activities. Inherent in the concept is a broad range of mental activities that facilitate knowledge acquisition and application (Prawat, 1989 in Kraiger et al, 1993). Statements that referred to a coping, preparation, or caregiving strategy and statements that demonstrated management or planning represented 2% (10 lines) of the transcribed journals (Journal Sample 6). The examples selected include the strategy employed by one subject to meet a goal set the previous week: to find out the patient's understanding of her prognosis (3:3). In the

second example the subject demonstrates how humor was used (in response to a challenge posed in earlier instructor feedback) (4:10). Note that the strategy and the process are coincidentally reported in this entry.

Journal Sample 6: Demonstration of Strategies

She and I discussed the nature of her disease and she is comfortable discussing the topic. She is well aware of the outcome and verbalized that she is ready when the day comes for her to die. ("Hopefully I won't have too much pain"). I asked her re: her feelings about death and she stated that she wasn't afraid (3:3).

... I did this by making a remark about hospital life, to which he laughed. Once this was done, I was able to steer the conversation in the direction of his living arrangements after he left the hospital. I also use humor with other staff. I use it particularly as a form of defense, but also as a rapport builder. The defense side comes at the beginning of the relationship when I'm trying to feel out the relationship (i.e.) is it going to be a friendly, or a you do your thing and I'll do mine type of relationship. Once this is established, and I know it's a friendly relationship, I use humor just because it's fun, makes the day go faster, and most importantly for this profession, in which there can be some very serious and stressful moments, it is a very good way to release stress, at least for me it works (4:10).

C. started to discuss his (increased) level of emotionality with age and how he cried all afternoon yesterday. He said he didn't know why he cried so much but he had felt much better afterwards and was glad that it had happened. C. mentioned this openly to both E. (his roommate) and myself. Then E. volunteered that he most likely would have a good cry when he got home. I replied that if he felt that need before then, to please express it to someone and/or go ahead and have a good cry. Being one who knows the merits of crying ... I sang its praises! The "2 men" seemed to have formed a strong bond in a short time. Their feelings about life (its worth and its trials) their open respect and genuine liking and concern for one another, their intellect and senses of humor all contributed to the development of friendship and camaraderie for them – the big plus, they let (instructor) and me into the Boy's Club! They were happy to share the caring atmosphere. When

C. was leaving upon discharge, E., C. and I all ended up with lumps in our throats and tears in our eyes. I felt especially bad for E. as he was left behind. C. is in good hands, his wife is terrific, but I'm sure he'll experience a few blue days upon arrival at home (3:8).

Goal-setting

Goal-setting is defining an object or an end that one strives to attain (Webster's, 1988). Mechanisms that are presumed to operate through goal setting include direction, arousal, and persistence of effort (Kraiger et al, 1993). An implicit assumption is that if students are metacognitively aware, they are also aware of their goals. Goal-setting will lead to assessing the task at hand and contemplating appropriate strategies in a metacognitive manner. Goal-setting, developing metacognitive awareness, and implementing strategic action are seen as interactive facets of the same process.

All the statements in this coding category indicated an intent to do something in the future. Specified or inferred goals accounted for 5% (22 lines) of transcribed journal entries (Journal Sample 7). The examples chosen are fairly indicative of the subjects' intentions to achieve. Most goal-setting statements were enmeshed with self-monitoring comments, such as self-evaluation.

Journal Sample 7: Evidence of Goal-Setting

As for my patient, if she is still there I would like to find out how much she knows about diabetes and if she would like to know more. I would like to teach her what it is and what it is doing to her and maybe what she can do to make things better for herself (1:2).

I resolve to pay particular attention to the demands that ADLs and bedrest (as well as her health status) put on the integrity of her skin (3:3).

I think that I am going to have to improve my time management skills in order to accomplish all that I want and need to accomplish in a day ... I think that by improving my assessment skills, which I believe is happening a little each day of clinical, my time management problem will lessen (4:4).

I have to work on being tactful when it comes to assertiveness (5:9).

Self-monitoring

Self-monitoring includes self-knowledge and involves self-evaluation, self-regulation, and self-reinforcement (Pesut, 1990).

1. Self-knowledge is thought to be at the foundation for all knowledge and as "a unified process of thinking ... has moved (us) to appreciate the continuum of logic and emotion, mind and body, individual and nature, and self and other" (Kincheloe & Steinberg, 1993, p. 311).
2. Self-evaluation, the appraisal of one's own performance, involves a discrimination response -- a comparison between the information obtained from self-monitoring and the performance criteria, standards, or expectations of a desired behavior (Kanfer, 1975 cited in Pesut, 1990).
3. Self-regulation is the process of deliberately and carefully attending to one's own behavior (Kanfer, 1975 cited in Pesut, 1990); the act of checking on or regulating one's own performance (Webster's, 1988). Metacognitive skills of self-regulation are essential to successful task performance as learners detect and correct their own errors. A student who effectively self-regulates is one who bases explicit goals for learning on high levels of self-awareness -- one who has both a target goal (which provides a motivating challenge) and

metacognitive awareness (which provides information about possible appropriate strategies for accomplishing the goal) (Ridley et al, 1992, p. 295).

4. Self-reinforcement, or acknowledgment of accomplishments, is the motivational component of self-monitoring that involves administration of contingencies to shape behavior in order to meet established behavioral criteria or standards. Individuals will continually refine and/or shape their ideas, arguments or products based on their perceptions of a desired outcome (Kanfer, 1975 cited in Pesut, 1990).

Through the process of self-monitoring individuals develop metacognitive knowledge and experience, and thus are in a better position to understand and regulate their behavior (Kraiger et al, 1993). When students consciously monitor their cognitive activity they are able to benefit from failure by abandoning strategies that proved ineffective (Short & Weissberg-Benchell, 1989).

Self-monitoring comments accounted for 23% (107 lines) of the transcribed journals (Journal Sample 8). Basic appraisal comments like "my day went well" were common. The first sample is a good representation of this phenomenon (1:3). The other samples include examples of self-evaluation (1:7), self-regulation (5:9), and self-reinforcement (3:6).

Journal Sample 8: Evidence of Self-Monitoring

I feel I had a good day today. (I made it through the day). I got to know my patient a little better and I learned a lot about her ... I'm also starting to feel more comfortable in the hospital atmosphere (1:3).

She seems to want validation / feedback. I have tried to do this without making any decisions for her (3:3).

I did what I could to make her comfortable. I feel that I did a good job with her. By the time I left she was feeling better which made me feel good for her (1:7).

I have to work on being tactful when it comes to assertiveness. Often if I am arguing with someone I come off as more aggressive than I would like to (5:9).

C. imparted a compliment to me today that I needed to hear. It's really special when the roles reverse and the patient gives the nurse "care" and "timely empathy." It's something that nurses need to remember, to graciously accept such a "gift" from the patient -- we all have the need to give and contribute in some capacity (3:6).

Now that I have been on the floor a few times, I am feeling quite comfortable with the staff. Asking questions is much easier now. I am also glad that they feel comfortable enough with me to approach me when they need a hand or want something done (4:3).

Causal Attributions

All statements expressing reasons for success or failure were coded as causal attributions (Alderman et al, 1993). Causal attributions represented 4% (20 lines) of the transcribed journals (Journal Sample 9). Interestingly, there were no negative reportings, only positive attributions. Attributions were easily divided into five general categories and an example of each has been included in the sample: knowledge (5:3), nursing staff (3:1), assigned patients (5:9), clinical peer group (5:2), and nursing instructor (2:11).

Journal Sample 9: Causal Attributions

I am beginning to feel a lot more confident about transfers than I used to be (5:3).

Staff were most helpful and appreciative of our efforts (3:1).

Both my patients were cooperative and enjoyed visiting with me (5:9).

Our group is one of the reasons why I am feeling more confident about my abilities with each passing clinical day (4:2).

Because our group is so close I find clinical to be a real fun time (5:2).

I feel this was a very educational and energizing posting thanks to (instructor) ... She is (a) very supportive, understanding, thought provoking instructor with an excellent sense of humor. ... (sincere) in student education and (her) effort to better it. I feel energized by watching (her) efforts to increase her own knowledge of others, to always try to better (herself) by taking the extra time to ask for feedback on teaching skills, approaches, etc. (2:11).

Affectively-Based Learning

Affective learning outcomes arise from feelings or emotions that produce an effect strong enough to evoke a reaction or a change in action, thought, nature, or behavior (Webster's, 1988). Affective learning involves attitude (an internal state that influences the choice of personal action) and motivation (to increase one's competence) (Kraiger et al, 1993). All reportings in this study relate to attitude. Motivation, as a concept, was more likely to be noted in the goal-setting entries made by the subjects. Fourteen percent (61 lines) of the transcribed journals were dedicated to affectively-based learning (Journal Sample 10).

Journal Sample 10: Affectively Based Learning

Staff were most helpful and appreciative of our efforts. This demonstration by them helped to dispel some of our preconceived anxieties. I usually try to reserve judgment in such matters ... I too was prepared to defend myself with the staff ...

The positive interactions today have reminded me to keep an open mind and prepare to meet others halfway until given good cause to change my opinion (3:1).

I think that by changing our plans so we could help the staff in the morning we laid down the foundation on which to build a good rapport with them. I am looking forward to next week (4:1).

I enjoyed the challenge and using the admission form but was disappointed I couldn't finish it (1:8).

Metacognitive Awareness

Metacognitive awareness is reflective thinking that demonstrates self-awareness, knowledge awareness, task awareness, and strategy awareness. This conscious informed knowing or realizing is a pre-requisite to effective behavior control (Ridley et al, 1992).

Twenty percent (95 lines) of the transcribed journal entries indicate metacognitive awareness (Journal Sample 11). The first example included in the sample is the final and by far the most prolific journal entry for this particular subject (2:11). After a pattern of short entries and maximum use of the think-aloud option, this final entry demonstrates profound personal and professional growth. Chaffee (1992) refers to a similar process when he reports that students

seem to be undergoing a developmental process in which skills, attitudes, and perceptions are progressively reorganized into new cognitive patterns. This leads to breakthrough or "aha" experiences as students discover new methods and abilities ... revealed in student comments like, "part of my brain awakened" (p. 6).

The second example is the result of a topical suggestion made at one of the clinical post-conferences (3:4). Subjects were invited to write about their experience of writing a journal. The clip shared here is only a small sample of the entire entry by this subject on the value of journal writing. It is real testimony to the value of journals for this particular subject. The final example, a response to a written feedback challenge, demonstrates self-knowledge and a level of introspection and self-disclosure that was not apparent with this subject until the tenth week of writing (4:10).

Journal Sample 11: Evidence of Metacognitive Awareness

From my first meeting with Mr. G. in January to now, his condition and spirits improved 113%. Our first meeting G. laid in bed, did no ADLs, had no eye contact, did not talk to others but only to mimic what they said, tell them off or to moan and groan. Myself, I thought the first time I worked with him he would surely die within the next month, of respiratory complications or an embolism. I even verbalized to (instructor) that if I was in G.'s condition (bedridden, unable to care for myself) that I would feel the same as G., wishing I would die. Now G. sits himself on the edge of his bed, asks to sit in his chair, today said at 1100 hours that he could not go on the trip outside because he had to go to physio. He expresses interest in going home, he smiles, laughs, jokes, has eye contact, does his own ADLs. This a.m. I gave him the washcloth and he washed his own arms, face, trunk, plus peri-care. He wheels himself over (the unit) in his wheelchair and is becoming more restless being on the unit. He is looking for more stimuli to keep his interest, stating he enjoyed the humor room, going to physio, and going outside for the first time in 3 months. I've learned that when things look impossible and at their worst there still is hope. After all the medical interventions, pills, (treatments), there is still a stronger factor to heal and that's the spirit and will to improve ... (I've learned this posting the most challenging and educational type of patients ... not only (have) physiological but psychological conditions.) I know I've learned a very important lesson this posting with G. G. has learned how to get back on his feet I've learned that not always do you need a strong pharmacy to put you on those feet but a strong will. G. has the will but needed a little help to get him to realize it (2:11).

Journals are a reflection of what was, what is, what can be, and what is yet to be. They are the friend that never grows tired of listening to you, the teacher and interpreter of the meanings of life's lessons and pathways. They encourage objective self-examination in sometimes brutal, or sometimes gentle ways. Journals provide an impetus for self-growth, acceptance of self and appreciation of self. Through use of them, courage, independence and self-esteem can be restored. The ability to see a written review of one day and the place in time where one was physically, emotionally, cognitively, spiritually and socially is indeed a gift. It may not always be a review of what one most likes or desires regarding themselves but therein lies the secret to the worth of journals. The very personal relationship one has with oneself can be enriched with written meditation. It clarifies values and beliefs while providing necessary cohesion for the mind and the spirit (3:4).

I do know that I use humor when establishing a rapport with either patients, staff, or family. I find that humor, in the right situation, and when used correctly, can lower a person's inhibitions and make it easier for them to open up about a topic that they might have trouble talking about under more tense conditions ... I also use humor with other staff. I use it particularly as a form of defense, but also as a rapport builder. The defense side comes at the beginning of the relationship when I'm trying to feel out the relationship (i.e.) is it going to be a friendly, or a you do your thing and I'll do mine type of relationship. Once this is established, and I know it's a friendly relationship, I use humor just because it's fun, makes the day go faster, and most importantly for this profession, in which there can be some very serious and stressful moments, it is a very good way to release stress, at least for me it works (4:10).

Qualitative Analysis of Instructor Feedback

Both the student journals and think-aloud sessions were responded to in writing consistently using the Vision-Challenge-Support formula described earlier (refer to Appendix E). Written feedback was entirely contingent upon student input. Representative samples of vision, challenge, and support responses follow.

Vision

It was important to provide the subjects with a sense of direction -- a sense of where they had come from and where they were going. Fifteen percent (106 lines) of the transcribed instructor feedback was coded as vision statements (Feedback Sample 1). In some cases the visionary response merely enlarged upon or clarified what the subject had alluded to in the journal (2:11). In other cases the response was meant to provide insight to a patient behavior (3:11), or a nursing behavior (5:10). Some vision responses involved providing additional information and/or suggesting supplementary resources.

Feedback Sample 1: Vision Responses

Your 2nd paragraph (top of page two) encapsulates the essence of nursing practice ... (2:11).

This tendency to depend on the family for socialization needs is part of Mr. S.'s "culture." To be different he needs to learn new norms, new values (3:11).

It is my belief that the more in touch we are with self, the more effective we can be as caregivers (4:6)

Sometimes if we also explain why we insist the patient sit up, even if the explanation is repeated day after day, it helps the patient understand our reasoning. Therefore, assertiveness will usually be accompanied by good rationale (5:10)

If you were to rethink this statement are you certain that you did nothing to alleviate her pain? They say quality nursing care can be as effective as a heavy sedation (1:9).

Challenge

Some challenges appeared as short directives or questions written in the borders of the journal to inspire greater contemplation of a phenomenon. Other challenges appeared on the summary page as a list of invitations to engage in observation and introspection and to write about the experience in subsequent journals.

Malek (1986) asked comparable "thought-provoking questions" at four levels: (1) Begin with broad questions that focus on learner observations and encourage concept formation. (2) Incorporate questions that require interpretation of observations. (3) Develop questions that require application of principles to explain new situations. (4) Introduce questions that relate to interpretation of feelings, attitudes, and values (affective domain). She challenges students to expand their observations ("What are the similarities ...?", "Which observations appear to be significant?"), interpret data ("What did you find while assessing...?"; "What differences did you notice?"), apply principles to explain new phenomena ("Why do you think this could happen?"; "If this pattern continues what might result?"), and interpret feelings, attitudes, and values ("What happened when you ...?"; "How do you think he feels about it?") (p. 21-23). Raths (1986) also provides practical suggestions for effective responses to promote thinking skills: (1) Ask students to reflect on their own ideas to assume ownership. (2) Ask for analysis, that includes such things as examples, summaries, inconsistencies, assumptions, alternatives. (3) Challenge students' ideas, by asking them to generate hypotheses, interpret data, make judgments, and transfer information to new situations (cited in Wassermann, 1987, p. 464).

Thirty percent (211 lines) of instructor feedback was dedicated to challenging the subjects (Feedback Sample 2). Five types of challenge were presented: (1) asking the students to build upon a concept they have initiated; (2) asking for examination of values; (3) suggesting advanced planning; (4) presenting a challenge for individualized growth; and (5) metacognitive-like challenges. If entries were too brief probing questions were used to inspire more in-depth reflection (see #1). If entries were restricted to generalities subjects were directed to be more specific (see #4). Two subjects received a similar challenge to examine their values regarding "doing for" versus "doing with" the patient (see #2). They had both written similar scenarios about "feeling useless." Others were challenged to do specific advanced planning for the next clinical day (see #3). The presence of written metacognitive-like challenges came as a welcome surprise (see #5), as most of the metacognitive-like challenges were assumed to have occurred through oral dialogue about journal writing during clinical post-conference and one-to-one discussions.

Feedback Sample 2: Challenge Responses

1. Build Upon a Concept

What kinds of things did you do that worked? What didn't work? What would you try another time (1:7)?

What did you learn about Mr. T.'s pain that you did not already know? (4:4).

What kinds of things did you learn about Mrs. K.? Did you find anything that surprised you after you did research and had some preconceived ideas? (5:2)

What did you learn about the things to assess? dietary restrictions? risk of infection? effect on other body systems? (2:2)

2. Examine Values

Interesting, in your first statement you use the word "useful" and infer that you were not able to do much. What I would like to see you do is re-evaluate what happened last week. What is the nature of nursing? Is there more value placed on "doing for" patients than "doing with" patients? Is this allocation of value appropriate? Was there any benefit or gain for the patient when your assignment was strictly interactive (2:3)?

What was your reaction to use of the term "carwash" (used in reference to the wheelchair shower) (3:1)?

3. Advance Planning

When the "work" runs out, what can you do to make good use of your time? Develop a list of things you would like to do when time permits and keep the list handy for easy reference (1:4).

Next week with Mr. G. be conscious of measures to take to prevent circulatory and respiratory complications in view of his inactivity (2:6).

One dilemma for you is inadequacy of time to accomplish your goals. I encourage you to set your goals for next clinical day and then assertively stick to those goals. I have a tendency to keep students too busy sometimes. Don't be afraid to discuss your needs -- to be assertive with me (3:2).

4. Individual Growth Challenge

I would like you to journalize for the next two weeks on:

- 1. Behaviors in other members of the health care team that inspire patient cooperation. Be specific.*
- 2. Behaviors in other members of the health care team that seem to create barriers with the patient. Be specific.*
- 3. What you feel could be done to improve the quality of life for your patients. Be specific (2:9).*

We have only three clinical days left on (this floor). In the remaining time I want to pose a special challenge ... For the next two weeks I would like you to observe and journalize

- 1. How other members of the health care team use humor to gain staff cooperation, patient cooperation, family cooperation. Be specific.*

2. *Other methods that are effective in gaining cooperation. Be specific.*
3. *Your own behaviors that inspire rapport with staff, patient, family -- What worked? What didn't work? Be specific (4:9).*

With only 3 weeks of clinical left I am challenging each member of my clinical group in a special way. This is the challenge I have for you. For the next 2 weeks observe and journalize

1. *Examples of assertiveness in other members of the health team (nursing staff, doctors, physio, students, patients, family, etc.). Be specific.*
2. *Examples of times when assertiveness behaviors would have been more appropriate than what actually happened. Be specific.*
3. *Examples of your own assertiveness and lack of assertiveness. Be specific (1:9).*

5. Metacognitive-Like Challenges

Writing-to-learn (through journal writing) involves developing insight into choices and decisions you make. For example: if you chose to get Mrs. M. a glass of ginger ale rather than the grapefruit juice on her tray -- why did you chose to do that? what was the result? would you do it again? why? why not? Next time you write chose two or three choices or decisions from clinical and develop them in this way. Then comment on how it felt to analyze your thinking so carefully (1:7).

My intent (through verbal or written dialogue) is to inspire deeper examination of the thought processes that are involved in your nursing activities and decisions (2:4).

Support

Fifty percent (365 lines) of the transcribed lines were devoted to support statements (Feedback Sample 3). This high percentage of support was necessary to gain and maintain a safe environment for reflection. Six types of supportive comments were coded: (1) response to the first journal; (2) response to think-aloud sessions; (3) border comments; (4) commendations; (5)

acknowledgment of a response to a challenge; and (6) recognition of evidence of personal or professional growth.

A supportive response to the first journal attempt was vital to the success of the project for it established an indication of what could be expected (see #1). Response to think-aloud sessions provided the role modeling which eventually inspired the courage and/or the incentive to write (see #2). Border comments were merely short reactions to specific journal content (see #3). Commendations were especially powerful in affirming the subjects' self-worth (see #4). They were not limited to instructor approval, but came from staff, patients, family, and other members of the health care team and were shared via the instructor feedback. Acknowledgment of a subject's response to a challenge was key to ensuring similar behaviors in the future (see #5). Recognition of evidence of personal or professional growth was acknowledgment of the fruits of our collaborative effort -- the success of the action research project (see #6).

Feedback Sample 3: Support Responses

1. Response to First Journal

I was really impressed by your sensitivity to Miss L.'s needs for personal hygiene and grooming. She is very concerned about cleanliness, odor control, and personal appearance. Your sensitive manner put her at ease with your care (1:1).

*You did exceedingly well with a very challenging patient. You did not seem intimidated by his **numerous** attachments -- NG, IV, O². Morning care was accomplished efficiently. Mr. L. seemed very receptive to your care (2:1).*

You worked with Mr. K. very effectively -- were able to establish an early rapport and trust with this man. (Also), I must comment on your supportiveness of your peers -- noted throughout the morning care, the orientation, and so on (4:1).

Your ability to work with M.V. in a supportive and non-judgmental way was excellent. I watched as you patiently organized and escorted her to the shower. You were able to accomplish this even before breakfast despite your lack of familiarity and preparation for a patient assignment (5:1).

2. Response to Think-Aloud

I found our conversation really enlightening – you have really good insights into your patient interactions and their interactions with others (e.g. the relationship between Mrs. K. and her daughter – the (positive) effect on Mrs. K.'s self-esteem) (5:4).

You demonstrate a fair amount of insight regarding patient behaviors and your nursing decisions (e.g. differences in your assigned patients and your ability to change your approach accordingly) (1:5).

Your thoughts on prioritizing (also reflected in your organizational plan) were based on sound thinking (5:4)

3. Border Comments

This is progress -- organizational skills are definitely getting better each week (1:8).

I'm glad you were prepared to explain IVP to Mr. D. (2:2).

You worked well with her especially in the area of allowing her to explore her concerns about housing (4:3).

Good, you gave her a chance to explain her frustrations (1:9).

4. Commendations

This was a good opportunity to participate in some of the ward routines. I'm glad to see your self-direction in creating opportunities to learn and to contribute to the team (1:9).

You have a unique relationship with your patients. I really am fascinated by the way you get them to focus on strengths and ability to overcome adversity. It is also neat, the way you help roommates develop a relationship (3:10).

I appreciated your participation by offering examples of judgmental data from your research. Notice I didn't label anything as judgmental -- I merely acknowledged the objective and subjective data (4:3).

As a nurse you will always allocate your time according to the greatest need. It is neat that you are trying to think of how to maintain balance (with both patients) (5:7).

5. Acknowledgement of Student Response to a Feedback Challenge

You've provided interesting examples of assertive behaviors or lack of... You have also indicated a desire to develop assertive behaviors in yourself. If you continue to record examples in this way, there is absolutely no doubt that you will develop more and more in this area (1:10).

*Your ability to express all those things I hope can happen through journalling is phenomenal ... You are my very best example of what can occur if one frequently consciously reflected on things. Because **you have** kept a diary through the years, you are familiar with the process. But I believe that what is expressed here is far more than years of practice with writing. The depth of your exploration can only be attributed to tremendous personal growth (transformation) as the result of intense reflection on life. From my limited experiences, this only happens for people who have survived serious crises in life. The more we grow through our own pain the more effective we are in working with others (3:8).*

I am wondering if posing a question helped you focus your thoughts and your writing? Were you inspired to take more of a risk in writing after you shared your journal with a classmate? Or are you perhaps at the point where the trust level is high enough that you can just let your thoughts flow freely (4:10)?

6. Acknowledgment of Evidence of Personal or Professional Growth

I've just re-read your journal and all I can say is WOW! Up until now you've been a man of few words. Did asking you to focus on something help? This journal entry demonstrates a fair amount of insight into your beliefs and values concerning patient care and patient rights. It helps me to understand that your approach is intentional and purposeful and, above all, therapeutic. Thank-you for the extra effort, for responding to my questions, for letting me know who you are as a practicing nurse (2:10).

It is difficult to put into words what an incredible "gift" your last journal is for me. I started to read it and got one check mark on paper -- when I realized I was

into something much different than you have submitted before -- there is insight and feeling and so much honesty. You have no idea how rewarding it is for me as an instructor to be witness to this incredible personal and professional growth (2:11).

I am moved to emotion having read your journal. You are clearly able to articulate your role in supporting patient and family. They are so fortunate that you have evolved to the level that you are at through your own experience with loss and grief. There is no greater gift to give than what you have given these people (3:5).

This concludes the data analysis section. Admittedly, some of the representative samples have been long and uncommonly revealing. These personal aspects have been shared without reticence in the hopes that demonstrating the process and the results will be inspiring to other educators.

Discussion

The initial intent of this project was merely to increase the quantity and the quality of journals kept by student nurses during a clinical practicum. In-depth analysis of five journals has provided evidence that both goals (quantity and quality) were achieved, and to an extent beyond the researcher's expectations. The subsequent decision to analyze the journals for evidence of metacognitive growth also proved fruitful. Even in the absence of intentional instruction in metacognition, two-thirds of the subjects' journal entries identified metacognitive processes. For all intents and purposes this study demonstrates that metacognitive growth can be evident and even measured through journal writing. However, the outcome was the result of an interactive process that was essential to the success of the study. The process and the outcomes will be

discussed under four headings: journal writing for metacognitive development, the role of instructor feedback, individual metacognitive growth, and the use of journals to assess learning. Then the limitations of the study and suggestions for future research will be examined. Finally, two theories will be discussed. The theory of writing-to-learn (Allen et al, 1989) will be confirmed and a theory of writing-to-come-to-metacognitive-awareness will be proposed.

Journal Writing for Metacognitive Development

Several things were accomplished by employing the learning journal: (1) The subjects explored and took risks through a process of self-questioning and self-talk. (2) In the process they employed higher-level thinking skills that incorporated both "thinking" cognition and "feeling" cognition. (3) They formulated definitions of themselves, their beliefs and their values. And, (4) they engaged in developing their own voice through reflective writing.

The weekly written dialogue provided an opportunity for the subjects to raise questions not dealt with elsewhere and allowed freedom (on the part of the subjects and the researcher) to respond to comments and observations. Just as Newton (1991) observed, as the subjects recorded their responses, their metacognitive awareness grew. They became increasingly more comfortable as critics of their own learning processes as they reviewed their own meaning-making processes. Ultimately, they became aware of care-giving and coping strategies, and they gained insight about themselves as learners and as human beings (p. 478).

As a teaching strategy, the learning journal allowed the instructor to develop a personal relationship with each subject so that instruction could be individualized. With the insights the journals provided, the instructor was

better able to generate ideas and to stimulate the students' powers of observation and their emotions, making it harder for them to remain passive (Worrell, 1990). Also, clinical assignments could be customized to meet the learning needs of each individual.

When the subjects were asked to think about their thinking and write about their insights they were actually being asked to identify metacognitive activities and processes. By participating in this weekly self-examination, not only did they encounter self-discovery but they were launched into a sequence of metacognitive processes that resulted in more prolific and more introspective journalizing by the end of the project. The subjects were metacognitively aware and metacognitively inspired to become more active in planning their activities, predicting consequences, testing reality, monitoring their progress, and regulating their behaviors accordingly.

The Role of Instructor Feedback

Although it is difficult to determine the degree to which the feedback stimulated metacognitive responses, there seemed to be a high correlation between the Vision-Challenge-Support formula and student self-disclosure of thinking and doing processes. Especially at the outset, there was a fine line between potential learning (with the journal) and potential roadblocks to learning. When Cameron and Mitchell (1993) engaged in interactive journal writing, to explore the use and misuse of journals, the student's needs were identified as, (1) an explicit understanding of why, what, and how to keep a journal, and (2) a safe environment free of fear of reprisal. An attempt to deal with the first concern, a need to understand the intent and the expectations, occurred at the introduction to writing-to-learn, when the purpose of the

learning journal was clarified. The second concern, a need to feel safe, may have been accomplished, in part, through supportive feedback and modeling.

The supportive nature of the instructor feedback seemed to help relax participant anxiety regarding the unknown factor in the instructor. The predominance of positive feedback gave the subjects permission to acknowledge the positive elements in their practice as well. Cameron and Mitchell (1993), however, pointed out that there is a fine line between a safe environment for sharing and an environment that is too safe. One can only speculate on whether the right climate was achieved in this study. It is certainly possible that a different distribution of feedback comments (more challenges, for example) could have resulted in an even more "metacognitive" outcome.

Modeling was likely another important element. Turner (1993) recommends that all educators help their students by modeling and encouraging metacognition in the classroom and other educational settings. Because students may not appreciate the significance of strategic behavior unless they witness the facilitative effects of strategies on another's behavior, it is important for educators to model cognitive, metacognitive, and motivational strategies (Short & Weissberg-Benchell, 1989). Modeling was a conscious element in three ways: (1) a think-aloud approach was employed to work through questions and dilemmas in the classroom as well as the workplace, (2) the researcher kept a journal, albeit for a another purpose, that four of the five subjects read each week, and (3) thoughtful feedback was written in response to each student journal and/or think-aloud session.

Although the supportive comments were identified as playing an important role in creating a safe environment in which to dialogue, the challenges had the

most potential to stimulate deeper reflection and identification of metacognitive processes. Some challenges arose out of the contents of the journal; others arose out of insights gained through clinical interactions and observations. Specific and challenging goals, like the challenges given to each participant two weeks before end of the clinical rotation, are said to lead to higher levels of performance than would result from easy goals, vague goals, or no goals (Ridley et al, 1992). Questions for the sake of creating work would not have been productive. The questions posed needed to be thoughtful and individualized challenges in order to inspire personal and professional growth.

Admittedly, more vision comments could have been inspiring as well as educative. To aim for more vision would be a valid goal in future use of the interactive learning journal. In the absence of any comparable research with student nurses, one has to conclude that the process worked well.

The relationship developed with the subjects through the interactive journal definitely changed their perceptions of journal writing and possibly their attitudes changed as well. Chamberlain and Vallance (1991) found that "students who perceived their relationships with professors to be open and encouraging ... reported they were more likely to ... go beyond" the expectations of the experience. However, they also reported that students who were overwhelmed by a task and lacked trust in the process tended to imitate (their teacher) in order to survive (p. 153-154). One can only speculate on the degree to which the students in this study may have yielded to the wishes of their instructor, whether out of generosity and support or as a strategy for survival.

Whether it was an advantage or a disadvantage that the interactive learning journals were completed far in advance of the decision to subject them to intense scrutiny is uncertain. Prior knowledge would have perhaps ensured even more consistent results. Other similar studies recommended more structure. Alderman et al (1993) reported that increased structure led to increased writing and increased monitoring by students. They concluded that: (1) students cannot be left to discover strategies on their own -- they need specific strategy instruction, and (2) facilitators of learning must be good strategy users themselves in order to instruct and model these behaviors. Zellermyer, Salomon, Globerson, & Givon (1991) alluded to the same principle when they claimed that instructor facilitation depended on the capacity to provide the desired metacognitive-like guidance. However, some of the elements of the "informal" approach may have been essential to the progress of the subjects of this study. For example, using think-aloud as an alternative to writing was responsive to the differences in learning preferences and may have significantly influenced subsequent journal writing.

Individual Differences in Metacognitive Growth

There were significant differences in the subjects' use of the journal writing process. Most of the difference seemed to be related to comfort with writing and trust of authority. It would have been inappropriate to hold the same expectation for all of the participants. Some subjects communicated their thought processes much more fluently in oral dialogue. This is likely related to individual learning preferences. I do not apologize, however, for continuing to prefer written dialogue, for several reasons. Those who wrote more freely may have experienced a medium of expression previously not valued in their

educational process. Those who were uncomfortable probably benefited from the stretch to function in less comfortable learning modes. Writing is a strategy that assists in learning, as well as in the development of thinking processes, and the development of a "voice" to express what and why, for example in nursing, actions and decisions are chosen.

A significant transformation seemed to occur, especially in the subjects who were initially uncomfortable to write. Peer influence may have played a role in this perceived increase in comfort. The subjects, as a group, demonstrated an exceptional level of peer support. They nurtured one another every step of the way, especially during difficult times, and they celebrated one another through all times. It is possible that they helped one another develop the confidence and the trust to write more freely.

As one would expect, the subjects in this study were all functioning at different cognitive levels. Some focused more on surface strategies, the non-complex activities that are pre-requisites to metacognitive processes and are thus, important markers in assessing metacognitive growth. Alderman et al (1993) observed that students tend to mention strategy use (equivalent to surface activities in this study) more when initially acquiring them. As strategies become a part of the learners' repertoire, they mention them less and concentrate more on monitoring them. This evolutionary process that moves the student into the realm of self-regulation and other metacognitive processes was definitely occurring as we progressed through the semester.

Although the subjects demonstrated varying degrees of self-awareness at the outset, they all developed a way of demonstrating increased self-awareness through their writing by the end of the experience. The most prolific writer

admitted to a strong affinity for introspective writing and, as a result, demonstrated what Scheier, Carver and Gibbons (1979) refer to as high private self-consciousness. They found that individuals with high private self-consciousness (1) are better able to elaborate on their self-characteristics; (2) behave in a manner more consistent with their personal values, beliefs, feelings, and attitudes; (3) use their greater sensitivity to their own cognitive and affective states to manage stressors, thus resisting stress-related illnesses better than individuals low in private self-consciousness; and (4) are less prone to accept misleading feedback because of greater sensitivity to their own beliefs, values, and emotions (cited in Ridley et al, 1992, p. 297). These four points are all strong reasons to promote self-awareness as part of the socialization process for nurses.

Use of Journals to Assess Learning

If nurse educators are truly committed to teaching critical thinking and decision-making skills then it is essential that the curriculum design match the intent. Thinking and decision-making imply a questioning stance and exploration of alternatives. In order for this to happen, students must be provided with opportunities to question and explore. The interactive learning journal, as presented in this study, provides an excellent medium for these processes to occur, especially when augmented with oral dialogue. Dialogue is an excellent way to develop thinking skills. Use of both oral and written dialogue is responsive to differences in learning styles and learning preferences.

Dialogue, whether written or oral, can reveal the decision making process, rationale for actions, outcomes, and the evaluation thereof. It will also reveal evidence of self-knowledge, knowledge of task, and knowledge of and ability to

vary strategies (metacognitive awareness); as well as how cognitive activity is directed, planned, and monitored as a predictor of success (self-regulation) (Bondy, 1984). This approach makes the students an integral part of their own evaluative process, which is in keeping with the philosophy of adult teaching/learning..

Two limitations of clinical supervision have potential to be overcome through the use of the learning journal: (1) thought processes cannot be assessed without dialogue and (2) much of nursing practice will never be witnessed. For example, to demonstrate this dilemma, the nursing instructor can only observe students in isolated short-term encounters, and cannot always take time to assess the full intent or come to know the thought processes behind behaviors and decisions. In this study, the journals revealed some important cognitive processes that contributed to effective nursing practice. Only through the journal was the researcher privy to some very significant learning events.

Bagley and Gallenberger (1992) propose journal writing can be an effective method of gathering information about students' disposition toward nursing practice -- as they reflect, explore alternatives, and demonstrate perseverance and sustained interest. They feel journals are a viable alternative method of evaluating students. Through journal entries, instructors can identify which students are understanding and which are not, and where students are having difficulty (Feathers & White, 1987, p. 273). Additionally, evidence of capabilities in self-regulation and evidence of self-control in cognitive processing may provide valuable information when making up student assignments. However, del Bueno (1983) warns that numerous factors (such as risk, urgency, possible consequences, previous experience, available data base,

values, and anxiety) may complicate the conclusions drawn from any single example of a person's clinical behavior or judgment (p. 7). This observation only serves to emphasize the need for multiple approaches to assessment of learning.

Limitations of Study

Because the study was not identified as a formal research project at the outset it lacked some of the planning and control of variables that may be seen as essential to valid research. There are several limitations apparent in this study that should be corrected in a future study: (1) Commitment to a research project from the outset would help to ensure an intact set of data for analysis. (2) If metacognitive strategies are to be assessed they should be taught in a more intentional way at the outset of the study. (3) Consistent use of think-aloud and other modeling strategies by the instructor would benefit from advanced planning. (4) All students in the study should write a consistent number of journals (e.g. every week). (5) Think-aloud sessions used in the place of journal writing should be used for a pre-planned period of time with all of the participants. (6) Intentional instructor feedback could be designed to ensure a consistent percentage of vision, challenge, and support comments. (7) Data analysis could include a breakdown of surface activities and metacognitive processes for each subject.

Processing of the data could also be handled differently. Coding and categorizing of data for this study was done exclusively by the researcher (due to time constraints and to protect the privacy of the subjects). In future studies, it would be important to work with a colleague or an expert in learning journals

and/or metacognitive processes to collaborate on the appropriateness of classifications and groupings of data.

There are other factors that must be considered in any qualitative study. Some of the subjects may have written what they thought the researcher wanted to hear. The optimal relationship between the subjects and the researcher may not have been achieved. There is potential for the researcher to either over identify with the subjects or to fail in establishing the necessary relationship and therefore be less effective in stimulating learning and growth potential. Other things that may have tempered the responses were not consciously examined. For example, the differences in past experience, current comfort with journal writing, and learning style differences were not addressed, but would add an interesting dimension to future research.

Suggestions for Future Research

Although the results of this study have provided strong evidence that learning journals provide a window to metacognitive development, it would be important to replicate the study (under more controlled conditions discussed under limitations) in the hopes of replicating the findings and confirming the theories (that will be discussed in the next section) (Firestone, 1993). In future studies it might be wise to consciously address learning style differences, previous experience with writing, and differences in individual benefits from journal writing. A post-experience survey (either a questionnaire or an interview) could be completed to determine the subjects' reactions to the experience with the learning journal. The subjects of this study were in their first year of the nursing program. It would be valuable to study groups of

students at the second and third year levels as well, or perhaps to do a longitudinal study with one set of students over the entire three years of the nursing program.

A Theory of Writing-to-Come-to-Metacognitive-Awareness

When one generalizes a theory, one uses a theory to make predictions and then confirms these predictions. Allen et al (1989) proposed a writing-to-learn theory. This study clearly supports their theory that (1) learning occurs through writing, (2) writing skills are primarily thinking skills, and (3) writing promotes understanding and discovery. The ultimate intent of this study, was not only to test and support the existing theory on writing-to-learn, but to develop a theory of writing-to-come-to-metacognitive-awareness. This may seem presumptuous, given the fact that several others have demonstrated, through qualitative research, the value of journals to demonstrate students' metacognitive processes. None of these predecessors, however, has made a strong case for writing-to-come-to-metacognitive-awareness. A theory of writing-to-come-to-metacognitive-awareness goes beyond Allen et al's (1989) theory of writing-to-learn to incorporate thinking and processing skills at the highest level in order to arrive at private self-consciousness.

This is my theory of writing-to-come-to-metacognitive-awareness:

With an adequate foundation (including instruction in strategies for metacognitive awareness) and regular, thoughtful feedback (designed to stimulate metacognition), students will develop self-knowledge, self-evaluation, self-regulation, self-reinforcement, and other inherent metacognitive skills that can be monitored (by themselves and/or their instructor) through their learning journals.

Implications for Nursing Education

It is pretty well agreed throughout the literature that critical thinking and decision making skills are becoming increasingly important for nurses in an age of rapid information production and technological advances; in the face of increasing complexity of health problems and the health care system; with rapidly expanding roles for nurses; and time constraints on nursing education programs. In order to effect the necessary changes in nursing education to cope with these rapid changes we need to adopt what I like to call the "thinking" curriculum.

It is time to abandon much of the content-driven curriculum in favor of a more process-driven curriculum. It is time to engage our students in dialogue as full participants in their learning process -- to allow nursing students to adopt a questioning stance -- so that they might develop a "voice" and a language to describe what they know and what they do as nurses. And it is time to re-examine the use of standard multiple-choice exams as the primary means of assessing learning.

Writing-to-come-to-metacognitive-awareness is but one tool that would be helpful in developing the critical thinking skills, the decision making skills, as well as the voice and the language that will be essential to the success and survival of nurses now and in the future. The interactive learning journal, demonstrated in this study, could have a much wider application than just the clinical practicum. It could become an adjunct to classroom teaching/learning -- even as an alternate method of assessing and measuring cognitive activity. To

recapitulate the words of Cameron and Mitchell (1993) and others, journals can be used as a teaching strategy, a diagnostic tool, an evaluation tool, a research method, and as a tool for professional and personal development.

Conclusion

This study demonstrates that the potential for discovery of metacognitive processes -- the monitoring of complex activities and thought processes -- lies just beneath the surface of human consciousness. Even in the absence of formal instruction in metacognitive processes, a verbal challenge to think-about-thinking was all that it took to prompt one group of first year nursing students to identify metacognitive processes from day one of a learning journal assignment. With the introduction of an interactive component -- weekly instructor feedback -- evidence of self-knowledge, theoretical knowledge, skill knowledge, and self-monitoring proliferated as the subjects identified their strategies and goals, as well as ongoing self-evaluation and self-regulation.

This study has clearly demonstrated the usefulness of the interactive learning journal as a teaching/learning strategy, a diagnostic/evaluation tool, a research method, and a tool for personal and professional growth. As a teaching/learning tool it promoted active participation of the learners in their own meaning-making processes: as they reflected on their practice they planned, predicted, monitored, regulated, evaluated and revised their strategies.

As a diagnostic/evaluation tool, the journals provided a window to metacognitive development, for both the learners and their facilitator, to examine, not only the thinking behind actions and decisions, but the level of self-awareness, task-awareness, and strategy-awareness. For the learners this

self-examination was tantamount to writing their own evaluations and having them confirmed by the facilitator. For the facilitator, the journals allowed a view of the learners' metacognitive processes and an opportunity to stimulate deeper reflection through the feedback dialogue.

Use of the journal as a research method -- a window to metacognitive development -- although not well represented in the literature accessed for this study, is demonstrated and supported through the results of this study. Replication through future studies will, however, be important.

As a tool for personal and professional growth, the interactive learning journal has unlimited potential for both the learner and the facilitator. Not only are self-conversation and self-reflection (elements inherent in the learning journal) a liberating experience (Moffett, 1968 cited in Allen et al, 1989), but they promote high private self-consciousness that results in confidence and convictions (Scheier et al, 1979 cited in Ridley et al, 1992). And there is no stronger case to be made in support of teaching metacognitive processes, as an integral part of nursing education, than the case made earlier (p. 59, this paper), for promotion of high private self-consciousness as an educational goal.

Nurses with high private self-consciousness are predictably better prepared to survive the rigors and the stressors of professional nursing practice without compromising their beliefs and values or succumbing to the socialization pressures within the health care system.

Prior to this study, I supported the use of journals as a means of helping nursing students to develop their thinking skills through reflection on practice. Based on this study I will now emphasize and promote both the interactive and the learning aspects of the journalizing process. The interactive learning

Student Journals: A Window to Metacognition

journal is one way that we, as nurse educators, can help student nurses to develop independent thinking, a voice and a language for nursing activities, and ultimately, metacognitive awareness.

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Notes

1. Different definitions for journals circulate in the literature. The definitions adopted for this study match with definitions by Heinrich (1992), Simmons (1989), and Fulwiler (1980). Heinrich makes a clear distinction between three commonly but inappropriately interchanged terms: logs, diaries, and journals. She points out that whereas logs develop a student's ability to "write with scientific objectivity", and diaries are "introspective exercises" written for the self only, journals are a "written dialogue between the self and a chosen audience of teachers, mentors, or colleagues" (p.17). Simmons clarifies the difference between journals and diaries; "the journal is typically posed as public discourse," the diary is private and personal. Fulwiler describes journals "somewhere on a continuum between diaries and class notebooks: whereas diaries are records of personal thought and experience, class notebooks are records of other people's facts and ideas. Like the diary, the journal is written in the first person; like the class notebook, the journal focuses on academic subjects the writer would like to learn more about" (p. 5-6).

2. Although there are many different definitions of metacognition they all contain common elements. Bondy (1984) clarifies "the difference between cognition and metacognition is a difference in self-awareness and control. Whereas cognitive processes may occur automatically and subconsciously, metacognitive processes involve conscious monitoring and regulation" (p. 234). Brown (1978) further clarifies that metacognition includes awareness (self-knowledge, knowledge of task, knowledge of and ability to vary strategies), and

regulation (how the subject directs, plans, and monitors cognitive activity -- the ability to predict success) (cited in Short & Weissberg-Benchell, 1989). Metacognitive skills include planning, monitoring, and revising goal-appropriate behavior (Brown, Bransford, Ferrara, & Campione, 1983; Schoenfeld, 1985), or understanding the relationship between task demands and one's capabilities (Pressley, Snyder, Levin, Murray, & Ghatala, 1987), and include skills in regulating or evoking appropriate strategies (Bereiter & Scardamalia, 1985). Metacognition has both a knowledge dimension (beliefs about one's ability, the demand of the task, and potentially effective learning strategies) and a skill dimension (mental acts of self-regulation via planning, predicting, monitoring, regulating, evaluating, and revising strategies) (Worrell, 1990, p. 171). Metacognition is "thinking about thinking" (Babbs & Moe, 1983 in Roberts & Clifton, 1992). It implies execution of tasks, and application of knowledge and skills integrated with self-knowledge, self-monitoring, and self-regulation; devising, monitoring and evaluating the outcome of a strategy -- observing or recording one's own actions, behaviors, thoughts, and/or affect (Klein, 1988 in Alderman et al, 1993). Metacognition addresses whether the learner is aware of how knowledge about the "self", the "task", and the "strategies" influences performance (Flavell & Wellman, 1977 cited in Short & Weissberg-Benchell, 1989, p. 42).

Learning-to-write paradigm	Writing-to-learn paradigm*
1. learn content whether or not they write well (memorize)	1. writing is the process through which content is learned and understood
2. writing and thinking involve different skills	2. writing skills are primarily thinking skills
3. know something before writing about it	3. writing is a process of developing understanding
4. writing is a sequential, linear activity; involves cumulative mastery	4. writing is a dialectical, recursive process
5. purpose is communication	5. purposes of learning and discovery as important as communication

* Adapted from Allen, Bowers, & Diekelmann, 1989

TOPICS FOR JOURNAL WRITING*

Class: Professionalism

Journal Writing Topic: Discuss the attitudes, skills & knowledge that constitute professionalism . . .

Class: Transcultural Nursing

Journal Writing Topic: When the patient has a background and beliefs different from your own ... how will you proceed?

Unit: Aging

Journal Writing Topic: Identify evidence of positive adaptive responses to aging in assigned patient (s).

Unit: Human Needs

Journal Writing Topic: Of all the human needs safety is one of the greatest . . .

Unit: Loss, Death & Grieving

Journal Writing Topic: Compare principles of the grieving process applied to a patient's experience with interruption in health . . .

GENERAL QUESTIONS FOR JOURNAL RESPONSE

What was it like to initiate a relationship with your assigned patient?

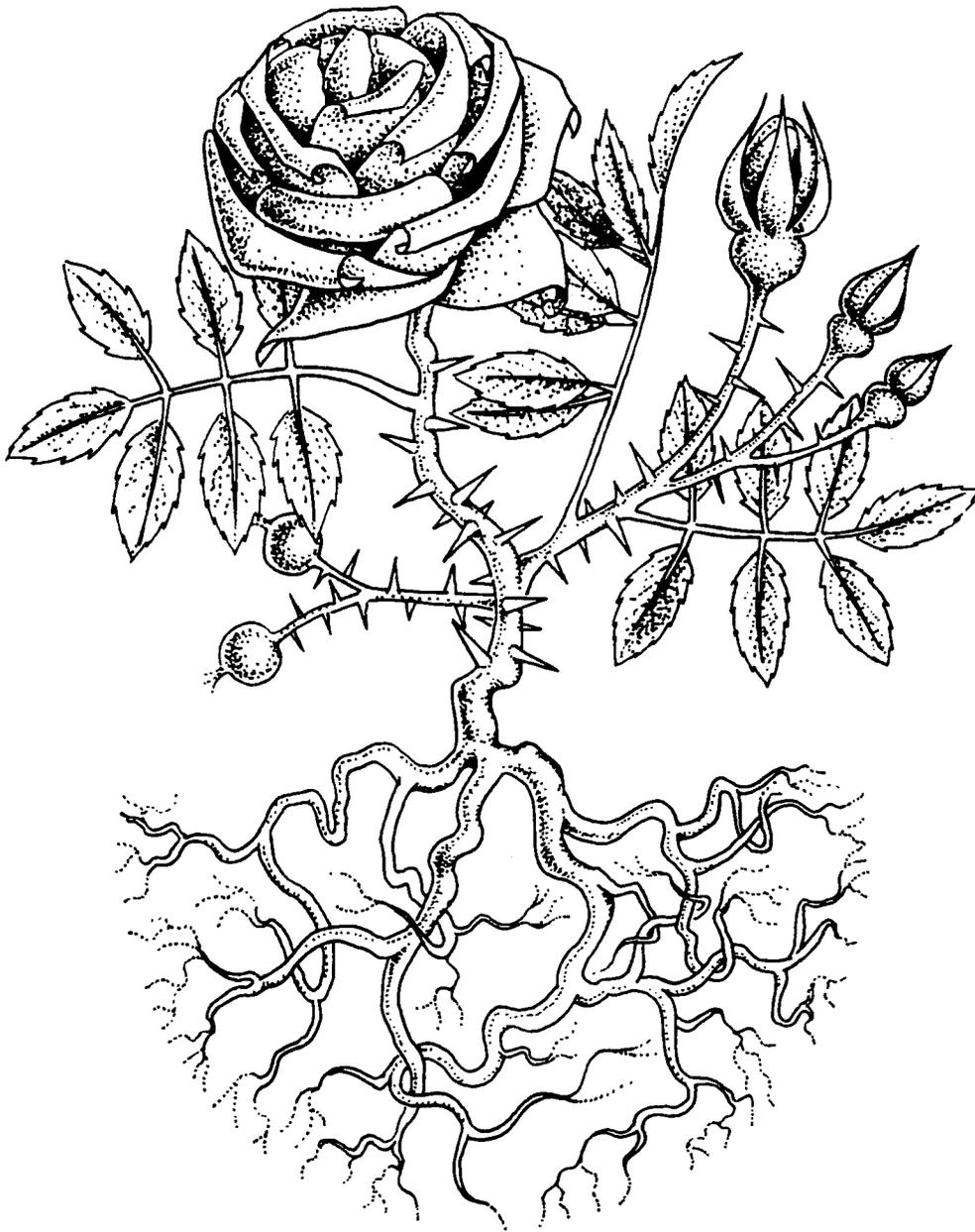
What new skills are you learning?

What are your feelings on terminating your relationship with your patient?

What is the experience of writing the interactive journal like for you?

* Adapted from Chamberlain & Vallance, 1991; Heinrich, 1992; Simmons, 1989

THE ROSE



* Artist: Georgia Pow-Graham (1987)

RESPONSES TO THE ROSE

Student

At first all I saw was a dumb tree pulled out of the ground with all the dirt cleaned from the roots . . . just hanging there. Then I started to see a connection with life - from beginning as a root, through all the trials in life, represented by the thorns, to the stage of full bloom.

You can not start out as the finished product (flower), rather it is a growing process in which there are some hard times that will be encountered (thorns).

Student

The picture compares to life

- * rose - softness - happy times, love, good things in life
- * thorns - hard times, death, unhappiness
- * roots - busy times, every day business, the roots are away from the thorns and flower to show how we get so involved in every day
- * new buds - things in life to come
- * half open bud - things we're accomplishing now (nursing)
- * leaves - closest to flower is our closest friends - close to bud, people we have not yet met - leaves farther from rose, acquaintances.

Instructor

The pen and ink drawing of the rose bush originated in 1987. As I put my experience of "growth through the pain of a loss" into words, the words were artistically translated, even as I spoke, into the most representative depiction I could imagine -- the drawing of the rose bush before you. The Rose continues to tell my story. These are only the highlights from *The Rose Bush Analogy* written for M.Ed. 5550 in 1993.

Note: After the students had shared their impressions, I provided a very brief overview of my analogy. I did not take time to allude to all the parts of the rose.

- The *roots*, naked for our viewing, are my *foundations*.
- The *stem* represents my *strengths* and my *limitations*.
- The *thorns* represent a dichotomy -- both *challenge* and *protection*.
- The *leaves* represent *opportunity* and *renewal*.
- The *buds* represent both *possibility* and *potential*.
- The *rose bloom* is the stage of *realization* of both my investment and my full potential.
- The *seed pods*, rose hips, are the *gifts* I have to offer - the vision, the challenge, the support; the ideas, values, and inspiration; the insight and the wisdom.

**USE OF JOURNALS:
GUIDELINES FOR
INSTRUCTOR FEEDBACK***

VISION

Help learner to see
where s/he is going

CHALLENGE

Create cognitive dissonance
by posing questions and
other ways of thinking

SUPPORT

Provide positive reinforcement
that confirms learner's worth

* McAlpine, L. (1992). Learning to reflect: using journals as professional conversations. Adult Learning. Jan., 15, 23-24.