Validation of the Learning and Study Strategies Inventory With a Sample of Students in Nursing

Sandra Beermann Chacko, Des Moines Area Community College

Mary E. Huba, Iowa State University

The authors examine the construct validity of the Learning and Study Strategies Inventory (LASSI) using first semester nursing students. Although 10 subscales have been identified by the authors of the instrument, factor analysis of the LASSI data obtained from the current subjects resulted in 4 reliable subscales. Results suggest that academic advisors, counselors, and learning center specialists should be cautious in the use of the LASSI with undergraduate students.

Academic advisors, counselors, and learning center specialists work with college students to promote academic success. They assess students' abilities and needs and make referrals to appropriate resources for assistance. One area in which assessments are made is that of learning strategies — the strategies students use for effective learning and retention of information (Nisbet & Shucksmith, 1986; Weinstein & Underwood, 1985). According to Wittrock (1974, 1978), effective learners are individuals who actively process, interpret, and synthesize information using a variety of such strategies.

Learning strategies is a broad term that encompasses a number of different competencies needed for effective learning and retention of information. Dansereau (1985) stated that students use primary and support strategies for effective learning. Primary strategies, such as paraphrasing, imagery, and networking, are used to acquire, store, and retrieve information. Support strategies, such as planning, scheduling, and concentrating, are used to maintain a suitable state of mind for learning.

Several instruments are commercially available for advisors, counselors, and learning center specialists to measure such learning strategies as note taking, time management, work habits, and attitudes toward school and study (e.g., Brown & Holtzman, 1953; Carter, 1958; & Christensen, 1968). However Weinstein, Zimmermann, and Palmer (1985) concluded that available commercial learning strategies instruments generally lacked desirable psychometric properties. They asserted that most of the recommended or "good" study skills instruments had not been empirically validated. There was no consistent definition of study skills, and most of the study skills inventories were self-report instruments that relied on subjects responding truthfully when completing the instrument. In addition, the reliability of the subscales was often so low that the subscales could not be used separately. Similar findings have been reported more recently by Sherman (1990). Another major concern is the availability of instruments validated for use with specific student groups in college versus instruments for use with the general college population.

At the time of Weinstein, Zimmermann, and Palmer's (1985) review of available instruments, they found that no study skill instrument had been validated for use as a diagnostic instrument. The Learning and Study Strategies Inventory (LASSI) (Weinstein, Schulte, & Palmer, 1987) has been recently presented as a diagnostic measure to (a) assess the study habits and active learning of individuals, (b) assist in planning individual prescriptions for remediation and enrichment, and (c) be used as a counseling tool with individuals. This instrument is recommended for use in college orientation programs, developmental education programs, learning assistance programs, and learning centers. The norm group consists of 880 incoming freshmen at a southern university.

The LASSI is a self-report instrument consisting of 77 items that use a Likert scale response format. The test comprises ten subscales: (a) study aids, (b) select main ideas, (c) information processing, (d) self-testing, (e) test strategies, (f) attitude, (g) motivation, (h) academic anxiety, (i) concentration, and (j) time management. After reading each item, the student responds that the statement is not at all typical (1), not very typical (2), somewhat typical (3), fairly typical (4), or very much typical (5) of him or her. Some items are stated in a positive direction, and others are stated in a negative direction. In the current study, all negatively stated items were recoded so all scales were scored in the positive direction.

The LASSI is a relatively new instrument with limited validity data. Construct validation has consisted primarily of obtaining the judgments of experts about the appropriateness of items within subscales. A multistage process involving the judgment of small groups of three or four persons was used. This limited number of experts may have resulted in shared bias in the development of the LASSI. To be useful to advisors, counselors, and learning center specialists, more empirical data are needed to provide evidence of the validity of the LASSI with entering college students in two-year and four-year institutions. The purpose of this study was to provide data regarding the construct validity and internal consistency of the LASSI for use with adult nursing students enrolled in a two-year community college.

Methodology

Subjects

The subjects of this study were first-year nursing students enrolled at a Midwestern community college during the 1988-89 academic year. All first-year nursing students were invited to participate. Of that group 134 (88%) volunteered. The institution is a multicampus college with a nursing program at three of the four campuses. Because the college has an open admissions policy, students are admitted to the nursing program based on the date of their application. The educational attainment of entering nursing students varies from a GED to a 4-year college degree. Ninety-seven percent of the nursing students are female.

The subjects were largely adult learners; 68% were over 24 years of age (M = 29, median = 27). Forty-four percent of the subjects were married, 35% were single, and 21% were separated or divorced. It should be noted that subjects included students both with and without children. Over one third of the subjects worked more than 20 hours per week.

Instrumentation

The LASSI provides 10 subscales measuring learning strategies of students:

Study aids—use of headings, special typefaces, special markings, summaries, and statements of objectives (Weinstein, 1987).

Select main ideas—ability to "pick out important information for further study" (Weinstein, 1987, p. 3).

Information processing—techniques used to organize and elaborate on incoming information, making it more meaningful (Weinstein & Underwood, 1985).

Self-testing—self-assessment of the degree to which learning has occurred and, if necessary, modification of strategies for achieving goals (Weinstein & Mayer, 1986; Weinstein & Rogers, 1985).

Test strategies—approaches used to prepare for and take examinations (Weinstein, 1987).

Attitude—interest in college and general motivation for succeeding in school (Weinstein, 1987).

Motivation—"diligence, self-discipline and willingness to work hard" (Weinstein, 1987, p. 2) to learn and achieve.

Academic anxiety—worry about performance in school (Weinstein, 1987).

Concentration-close attention to academic tasks (Weinstein, 1987).

Time management—ability to organize and systematically plan use of time (Weinstein, Zimmermann, & Palmer, 1985).

Each subscale contains eight items, with a possible score range of 8-40, with the exception of the Select Main Ideas subscale, which contains five items and has a possible range of 5-25. The manual (Weinstein, 1987) reports that coefficient alphas for the 10 LASSI subscales ranged from .68 to .86, and the test-retest correlation coefficients ranged from .72 to .85. No information regarding correlations among the 10 subscales is provided in the manual. With regard to validity, the manual states that "the LASSI has been subjected to repeated tests of user validity" (Weinstein, 1987, p. 5) and that advisors, counselors, and learning center specialists in more than 30 colleges and universities have found the LASSI useful.

Procedures

The LASSI was administered to the subjects between the fourth and sixth weeks of the Fall 1988 semester. Permission was obtained from the subjects prior to the administration of the instrument. The instrument was administered during class time and required approximately 15-20 minutes to complete.

Data analyses

Pearson correlations were computed to examine interrelationships among the 10 LASSI subscales. Further Pearson correlations were

computed among the subscales resulting from the factor analyses.

Principal component factor analysis was conducted to examine the construct validity of the LASSI. Oblimin rotation was used, and the number of factors was set at 10, the number of subscales in the LASSI. Successive analyses were conducted with the number of factors set at two through nine to determine the best representation of the data.

Reliabilities of the subscales derived from the factor analyses were determined by examining internal consistency estimates as computed by Cronbach's alpha.

Results

Correlation coefficients among original LASSI subscales and reliability estimates are reported in Table I. The correlation coefficients indicate moderate interrelationships among the subscales. The alpha coefficients ranged from 0.59 to 0.86 and are comparable to the alpha coefficients reported in the LASSI manual (Weinstein, 1987). Brown (1983) suggests reliabilities of .85 or higher for instruments measuring typical performance.

The factor analysis, with the number of factors set at 10, failed to converge to form a rotated factor matrix. Additional factor analyses were conducted with the number of factors set at 9, 8, 7, 6, 5, 4, 3, and 2. A rotated factor matrix was formed for each of these factor analyses. The criterion of eigenvalues being greater than one was used in determining the number of significant factors (Kaiser, 1958). The significant factors in each factor matrix were examined to determine the best representation of the data. We were best able to interpret a pattern and to assign meaning to the factors when four factors were extracted. Examination of the items led to labelling the factors as follows: (a) self-monitoring/use of study strategies, (b) self-efficacy, (c) concentration/preparation for class, and (d) motivation.

The eigenvalue and percent of variance after rotation for each of the factors are: (a) self-monitoring/use of study strategies, 15.04 and 19.50;

TABLE 1
Internal consistency estimates for and correlation coefficients among the Learning And Study Strategies Inventory (LASSI) scales

LASSI Scales	Correlation coefficients									
	ATT	MOT	TMT	ANX	CON	INP	SMI	STA	SFT	TST
ATT (Attitude)	.66 (.72)	.53	.43	.26	.55	.48	.51	.40	.38	.41
MOT (Motivation)		.81 (.81)	.71	.14	.57	.52	.38	.49	.60	.34
TMT (Time Management)			.81 (.86)	.16	.60	.33	.24	.43	.54	.34
ANX (Anxiety)				.86 (.81)	.45	.22	.53	−.01	−.03	.55
CON (Concentration)					.78 (.84)	.42	.37	.29	.43	.49
INP (Information Processing)						.82 (.83)	.54	.50	.55	.38
SMI (Selecting Main Ideas)							.74 (.74)	.30	.20	.69
STA (Study Aids)								.59 (.68)	.56	.15
SFT (Self-Testing)									.76 (.76)	.19
TST (Test Strategies)										.78 (.83)

Note. The diagonal coefficients are the alpha estimates for the sample and the normative group, with the normative group in parentheses. $p < .05$ for $r \geq .19$ (df = 133).

(b) self-efficacy, 6.89 and 8.90; (c) concentration/preparation for class, 3.70 and 4.80; and (d) motivation, 2.77 and 3.60. The total amount of variance accounted for by the four subscales was 36.8%. The factor loading of each item was examined, and any item with a factor loading below +.30 was eliminated. This resulted in the deletion of two items: (a) "I memorize grammatical rules, technical terms, formulas, etc., without understanding them," and (b) "When they are available, I attend group review sessions." When an item loaded on more than one factor, the item was chosen for the factor with the highest loading.

A listing of each item with its factor loading for each of the four subscales is presented in Tables 2, 3, 4, and 5. Subscale 1—self-monitoringluse of study strategies (see Table 2)—consists of 18 items and principally comprises items from the original information processing, self-testing, and study aids subscales. Two items from the other subscales were included.

Nineteen items form Subscale 2—self-efficacy (see Table 3)—which is primarily a combination of the LASSI subscales of academic anxietv, testing strategies, and selecting main ideas. All or most the LASSI's anxiety and testing strategies items are included here.

Subscale 3—concentration/preparation for class (see Table 4)—consists of 22 items. It includes 5 items from the concentration scale, all 8 of the time management items, 6 motivation items, and 3 self-testing items.

Sixteen items form Subscale 4—motivation (see Table 5). It consists of 7 of the 8 attitude items, as well as items from a variety of other subscales.

Subscale scores were formed by simply summing subjects' scores on the items comprising the scale and dividing by the number of items on that subscale. The mean, standard deviation, and range for each of the four subscales are reported in Table 6. The subjects' average motivation score was high, indicating that, on the scale used, it was "fairly typical" of subjects to be motivated in their academic studies. The behaviors being measured by the other three subscales were found to be, on the average, "somewhat typical" of the subjects. A wider range of scores was found for these three subscales, as com-

TABLE 2
Factor loadings and LASSI items for Subscale 1
Self-monitoring/use of study strategies

Factor loading	Content focus of LASSI Items	Original LASSI scale
.61	Translates study material into own words.	Information processing
.58	Interrelates themes in study material.	Information processing
.56	Identifies main points of lecture.	Select main ideas
.55	Applies study material to everyday life.	Information processing
.54[a]	Logically fits together study material.	Information processing
.53	Periodically stops and reviews material read.	Self-testing
.53	Enhances understanding by creating drawings or sketches.	Study aids
.51	Identifies possible test questions when reviewing study material.	Self-testing
.49	Uses textbook study helps, such as italics and headings.	Study aids
.47	Thinks through topic to determine what to learn.	Information processing
.45	Creates possible exam questions.	Self-testing
.45	Summarizes study material by creating charts, tables, or diagrams.	Study aids
.42[b]	Focuses on first and last sentence of paragraphs.	Study aids
.41[c]	Relates study material to own experiences.	Information processing
.40	Visualizes the meaning of new words or ideas.	Information processing
.40[d]	Reviews homework assignments.	Self-testing
.35	Uses chapter headings to identify important points.	Study aids
.31	Sets high standards for self.	Motivation

[a]Loaded .31 on Factor 4.
[b]Loaded .33 on Factor 4.
[c]Loaded .31 on Factor 4.
[d]Loaded .36 on Factor 3.

pared to the first. Reliabilities for the four subscales were determined by examining the internal consistency estimates as computed by Cronbach's alpha. The resulting coefficients (.86, .88, .91, and .80) are considerably higher than those of the original 10 LASSI subscales. Three of them were above .85, whereas only 1 of the 10 coefficients for the original subscales was that high.

Discussion

The results of this study indicate that when the LASSI is used with nursing students enrolled in a two-year nursing program, 4 reliable subscales are identified instead of the 10 intended by the authors of the LASSI. This may be due to the conceptual overlap and redundancy of the original LASSI subscales, which make it difficult to clearly distinguish among 10 separate constructs. For example, motivation and attitudes are two constructs that are closely related. When addressing the academic achievement of students, differences between these constructs may narrow and overlap.

Another possible reason for identifying 4 subscales rather than 10 may be the nature of the population studied. Adult learners have probably developed and stabilized their study strategies over numerous years of educational experiences, resulting in integrated patterns. From this point of view, it is not surprising to find that different constructs may be required to describe the learning process of adult learners. For example, one unique characteristic of the adult nursing students in this study was their uniformly high motivation, a characteristic that would not be expected with all student groups.

Regrouping of LASSI items is compatible with the view of Mealey (1988), who contends in a review of the instrument that "in some instances, items belonging to one subscale could be included in another" (p.383). For example, on the first subscale, self-monitoringiuse of study strategies, items represent several original LASSI subscales, yet all but one assess a student's ability to actively transform or rehearse information so that the underlying organization is made apparent or relationships with previously acquired knowledge are established. If

TABLE 3
Factor loadings and LASSI items for Subscale 2
Self-efficacy

Factor loading	Content focus of LASSI Items	Original LASSI scale
.81	Feels panicky during exam. (R)	Anxiety
.75	Doesn't do best on exam because of nervousness and confusion. (R)	Anxiety
.69	Can't concentrate on exam because of anxiety. (R)	Anxiety
.67	Feels anxious during exam even if well prepared. (R)	Anxiety
.64	Feels tense when studying. (R)	Anxiety
.64	Worries will fail. (R)	Anxiety
.61	Loses points because of misunderstanding exams or assignments. (R)	Test strategies
.61	Doesn't understand what test question is asking. (R)	Test strategies
.60	Gets discouraged by low grades. (R)	Anxiety
.56	Gets lost in detail when studying. (R)	Select main ideas
.55	Finds it difficult to adapt studying to different courses. (R)	Test strategies
.52	Performs poorly on test because of poor planning. (R)	Test strategies
.51	Can distinguish between less important and more important points of lecture.	Select main ideas
.49	Has trouble figuring out how to study well. (R)	Test strategies
.48	Can't easily identify important points in reading. (R)	Select main ideas
.48	Feels confident about test performance.	Anxiety
.44	Feels little control over self in school. (R)	Attitude
.44	Studies wrong material for exams. (R)	Test strategies
.34[a]	Compares class notes with others.	Study aids

[a]Loaded .32 on Factor 3.
(R) Indicates items with reverse coding.

TABLE 4
Factor loadings and LASSI items for Subscale 3
Concentration/preparation for class

Factor loading	Content focus of LASSI Items	Original LASSI scale
.81	Puts off studying. (R)	Time management
.69	Procrastinates. (R)	Time management
.68	Allows mind to wander. (R)	Concentration
.63	Studies only when test is imminent. (R)	Time management
.60	Reviews notes after class.	Self-testing
.59	Reviews notes before next class.	Self-testing
.56	Has difficulty maintaining study schedule. (R)	Time management
.52	Crams for tests. (R)	Time management
.51	Makes excuses for not doing assignments. (R)	Motivation
.50	Is easily distracted. (R)	Concentration
.49	Is current with assignments.	Motivation
.49	Reads textbooks.	Motivation
.48	Sets specified time to study and carries through with it.	Time management
.48	Cannot concentrate because restless and moody. (R)	Concentration
.45	Concentrates when studying.	Concentration
.44	Continues to work if material is dull	Motivation
.43[a]	Uses study time between classes.	Time management
.41[b]	Neglects school work because of personal problems. (R)	Concentration
.39	Works hard regardless of interest in course.	Motivation
.36	Is unprepared for class. (R)	Motivation
.33	Spends time with friends at expense of work (R)	Time management
.32	Tests self.	Self-testing

[a]Loaded .32 on Factor 1.
[b]Loaded .35 on Factor 2.
(R) Indicates items with reverse coding.

individuals' scores are low on the subscale, counselors could refer students to learning centers to assist them in the development of the study skills outlined in the items.

A review of the items on the second factor suggest that it represents one's perception of self-competence (McCombs, 1988; Palmer & Goetz, 1988). Self-efficacy appears to be an appropriate term to describe this scale because the items (see Table 3) reflect an individual's feelings and beliefs about performing tasks needed to be academically successful, such as understanding main ideas or taking tests (Bandura, 1982). Some items deal with feelings about one's general ability to succeed. Low scores on this subscale may indicate that students lack academic skills and have high test anxiety. Counselors could work with these low-scoring students to determine if there is a mismatch between their academic abilities and the courses for which they have registered. Further assessment in the area of test anxiety would be warranted, as would appropriate referrals.

Concentrationlpreparation for class is the label assigned to the third subscale in this study. This subscale refers to one's focus on academic tasks, as well as to the use of time management principles to both complete class assignments and prepare for examinations. The grouping of concentration and time management together is conceptually logical because students who have difficulty concentrating frequently manage time poorly. The original motivation items (see Table 4) included here also seem to address concentration or time management issues. Students who receive low scores on this subscale could be referred to resources to assist them with time management skills and the ability to focus on educational materials.

Motivation is the label assigned to the fourth subscale, which seems to measure one's desire to learn and one's commitment to learning, al-

though the items loading on this subscale seem more heterogeneous in content than those of the previous subscales. While three of the original concentration items are included in this factor, it could be argued that these particular items measure lack of motivation instead of lack of concentration. High scores on this subscale may indicate that students have selected a program of study consistent with their interests. Counselors may need to help low scoring individuals reassess their career interests.

Of course, the ultimate validity question concerning these constructs is their usefulness in explaining academic achievement (American Psychological Association, 1985). In a companion study to the current one, Chacko and Huba (1991) tested a conceptual model and found that the four subscales identified in this study were related to the academic achievement of undergraduate nursing students. This supports their usefulness to those who assist nursing students to become effective learners.

TABLE 5
Factor loadings and LASSI items for Subscale 4
Motivation

Factor loading	Content focus of LASSI Items	Original LASSI Scale
.56	Has difficulty paying attention. (R)	Concentration
.52	Relates material being learned with what is already known.	Information processing
.51	Gives up or studies easy parts when course work is hard. (R)	Motivation
.51	Is not interested in classwork. (R)	Attitude
.50	Does not value what is taught in courses. (R)	Attitude
.49	Studies only subjects interested in. (R)	Attitude
.43	Is interested in getting a job, not education. (R)	Attitude
.42	Is undecided about educational goals. (R)	Attitude
.42	Checks understanding of lecture material.	Self-testing
.40[a]	Has difficulty determining important points in text. (R)	Select main ideas
.40	Doesn't listen carefully and understanding suffers. (R)	Concentration
.40	Finds underlining helpful when reviewing text.	Study aids
.38	Is concerned about finding a spouse, not finishing school. (R)	Attitude
.37	Would prefer not to be in school. (R)	Attitude
.34	Doesn't listen to lecture; thinks about other things. (R)	Concentration
.32[b]	Can't summarize lecture and textbook material.	Test strategies

[a]Loaded .39 on Factor 2 and .31 on Factor 1.
[b]Loaded .30 on Factor 2.
(R) Indicates items with reverse coding.

TABLE 6
Means, medians, standard deviations, and ranges of four subscales of Learning and Study Strategies Inventory (LASSI)

LASSI Subscale	Mean	Median	S.D.	Range[a]
Self-monitoring/use of study strategies	3.52	3.47	.55	1.78-5.00
Self-efficacy	3.41	3.53	.62	1.58-4.58
Concentration1 preparation for class	3.40	3.36	.61	1.45-4.77
Motivation	4.18	4.25	.44	2.44-5.00

[a]Each total scale score was divided by the number of items in the respective subscale, resulting in a possible range of 1-5 for each scale.

TABLE 7
Intercorrelations among the four subscales of Learning and Study Strategies Inventory (LASSI)

	SM/USS	SE	C/P	M
Self-monitoringluse of study strategies (SM/USS)	1.000	.309	.597	.555
Self-efficacy (SE)		1.000	.330	.463
Concentration/preparation for class (C/P)			1.000	.485
Motivation (M)				1.000

Although this study concerns the use of the LASSI with a specific group of students (nursing students) at a specific type of institution (an open admissions community college), the results point to a more general issue: the need for validating instruments with various populations. The fact that items in this study clustered in ways different from that proposed by the authors of the LASSI illustrates that additional validation studies would be prudent with students of various disciplines and ages prior to its use by academic advisors, counselors, and learning center specialists. Further validation studies might focus on subjects who are directly entering college from high school and those who are adult learners. Special emphasis should be placed on members of the latter, increasing population whose approach to learning may be very different from that of traditional-age students. Validation studies should also be conducted with subjects in a variety of educational settings because different institutions may attract different types of learners.

In general, there is a need to continue to focus on the development of valid and reliable instruments to measure the learning strategies of students. Although numerous instruments are available, their usefulness to academic advisors, counselors, and learning center specialists is limited due to insufficient validity and reliability data.

References

American Psychological Association. (1985). ***Standards for educational and psychological testing.*** Washington, DC: Author.

Bandura, A. (1982). Self-efficacy mechanism in human agency. ***American Psychologist, 37,*** 122-147.

Brown. F. (1983). ***Principles of educational and psychological testing*** (3rd ed.). New York: Holt, Reinhart & Winston.

Brown, F. G., & Holtzman, W. H. (1953). ***Survey of study habits and attitudes.*** New York: Psychological Corporation.

Carter, H. D. (1958). ***California study methods survey.*** Monterey, CA: California Test Bureau.

Chacko, S., & Huba, M. (1991). Academic achievement among undergraduate nursing students: The development and test of a causal model. ***Journal of Nursing Education, 30,*** 267-273.

Christensen, F. A. (1968). ***College adjustment and study skills inventory.*** Berea, OH: Personal Growth.

Dansereau, D. G. (1985). Learning strategy research. In J. Segal, S. Chipman, & R. Glaser (Eds.), ***Thinking and learning skills: Vol. 1. Relating instructions to basic research*** (pp. 209-239). Hillsdale, NJ: Erlbaum.

Kaiser, H. F. (1958). The varimax criterion for analytic rotation in factor analysis. ***Psychometrika, 23.*** 187-200.

McCombs, B. L. (1988). Motivational skills training: Combining meta-cognitive, cognitive, and affective learning strategies. In C. E. Weinstein, E. T. Goetz, & P. A. Alexander (Eds.), ***Learning and study strategies: Issues in assessment, instruction, and evaluation*** (pp. 141-170). San Diego: Academic Press.

Mealey, B. L. (1988). Test review: Learning and study strategies inventory (LASSI). ***Journal of Reading, 31,*** 382-385.

Nisbet, J., & Shucksmith, J. (1986). ***Learning strategies.*** Boston: Routledge & Kegan Paul.

Palmer, D. J., & Goetz, E. T. (1988). Selection and use of study strategies: The role of the studier's belief about self and strategies. In C. E. Weinstein, E. T. Goetz, & P. A. Alexander (Eds.), ***Learning and study strategies: Issues in assessment, instruction, and evaluation*** (pp. 41-61). San Diego: Academic Press.

Sherman, T. (1990). ***Assessing student abilities.*** Paper presented at the meeting of the American Educational Research Association, Boston.

Weinstein, C. E. (1987). ***LASSI user's manual.*** Clearwater, FL: H & H Publishing.

Weinstein, C. E., & Mayer, R. E. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), ***Handbook of research on teaching*** (3rd ed.) (pp. 315-327). New York: Macmillan.

Weinstein, C. E., & Rogers, B. T. (1985). Comprehen-

sion monitoring as a learning strategy. In G. d'Ydewalle (Ed.), ***Cognition, information processing, and motivation: Vol. 3*** (pp. 619-629). New York: Elsevier.

Weinstein, C. E., Schulte, A. C., & Palmer, D. R. (1987). ***Learning and Study Strategies Inventory (LASSI).*** Clearwater, FL: H & H Publishing.

Weinstein, C. E., & Underwood, V. L. (1985). Learning strategies: The ***how*** of learning. In J. Segal. S. Chipman, & R. Glaser (Eds.). ***Thinking and learning skills: Vol. 1. Relating instructions to basic research*** (pp. 241-258). Hillsdale, NJ: Erlbaum.

Weinstein, C. E., Zimmermann, S. A., & Palmer, D. R. (1985). College and university students' study skills in the U.S.A.: The LASSI. In G. d'Ydewalle (Ed.), ***Cognition, information processing, and motivation: Vol. 3*** (pp. 703-726). New York: Elsevier.

Wittrock, M. C. (1974). Learning as a generative process. ***Educational Psychologist, 11***, 87-95.

Wittrock, M. C. (1978). The cognitive movement in instruction. ***Educational Psychologist***, 13, 15-29.

Sandra Beermann Chacko is Nursing Instructor and Mary E. Huba is Professor of Education. Address correspondence concerning this article to Sandra Beermann Chacko, 1624 Johnson Street; Ames, IA 50010.