



User's Manual

for those administering the

**LASSI for
Learning
Online
Inventory**

Claire E. Weinstein, Ph.D.

Department of Educational Psychology,
University of Texas at Austin

David R. Palmer, Ph.D.

Texas Health and Human Services Commission

Stephanie B. Corliss

Alicia D. Beth

Yoonjung Cho

Stephan J. Bera

Cynthia King

Angela L. Vaughan

Department of Educational Psychology



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**Claire E. Weinstein, Ph.D.
David R. Palmer, Ph.D.**

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FAX (727) 442-2195
E-Mail hhservice@hhpublishing.com
Web www.hhpublishing.com

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INTRODUCTION: THE LASSI AND LEARNING IN ONLINE ENVIRONMENTS

The Learning and Study Strategies Inventory, 2nd Edition (LASSI) (2004) is a 10-scale, 80-item self-report inventory that assesses students' awareness about and use of learning and study strategies in 10 different areas related to strategic and self-regulated learning: anxiety, attitude, concentration, information processing, motivation, selecting main ideas, self testing, study aids, test strategies, and time management. It is widely used in educational and training settings in the United States, as well as in other countries, to assess students' use of effective strategic and self-regulated learning and study methods in face-to-face learning contexts. However, despite the enormous success and effectiveness of the LASSI, it is not completely appropriate for use in online learning contexts due to some of their unique instructional characteristics and learning demands. For this reason the LASSI for Learning Online was developed. It uses the same theoretical framework of the Model of Strategic Learning and includes the same 10 scales as the LASSI with the addition of a new scale, Communication, because of the unique communication demands and opportunities in online learning environments. In addition, although some of the items on the LASSI for Learning Online are the same as those on the LASSI (in particular, the Anxiety Scale items), most of the items have been created for this measure or adapted from LASSI items to more accurately reflect studying and learning in online learning contexts.

For many reasons, online learning is increasing at an exponential rate in higher education, continuing education, and training settings in the United States. We have much to be excited about as online learning spreads to all levels and types of higher education. For example, over time

online instruction is more cost-effective, it is more easily accessible to learners for whom traditional education often has been inaccessible (e.g., older or working students and those in the military), it can provide high quality instruction in a broader range of areas than can be covered by "in-house" faculty, it is self-paced and the instruction in online environments is easily updated. However, despite the promises of this increasingly sophisticated instructional medium and the exciting educational possibilities it offers, there are many challenges inherent in online instruction from a student's perspective. Online learning offers the learner tremendous control of both the instructional resources and the technical tools provided in these learning environments. In the hands of students who know how to use these tools and are prepared to take responsibility for using these tools to enhance their learning, they can indeed be powerful tools. However, in the hands of students who may not be skilled strategic and self-regulated learners, such as students who have problems with managing time, meeting commitments, maintaining motivation, and knowing how to use learning strategies effectively and efficiently, online learning can offer many challenges.

The first step in helping students to thrive in online instructional contexts is to determine their awareness about and use of effective learning and study strategies and skills for online learning. The Learning and Study Strategies Inventory for Learning Online (LASSI for Learning Online) was developed to meet this growing need to assess students' ability to learn online so that steps can be taken to help them be better prepared to succeed in these rich instructional environments.

PART 1: OVERVIEW OF THE LASSI FOR LEARNING ONLINE

WHAT IS THE LASSI FOR LEARNING ONLINE AND WHAT DOES IT MEASURE?

The LASSI for Learning Online is an 11-scale, 88-item self-report assessment of students' awareness about and use of learning and study strategies related to **skill** (e.g., selecting main ideas and using cognitive learning strategies), **will** (e.g., maintaining motivation and having realistic goals), and **self-regulation** (e.g., time management and using a systematic approach to studying) components of strategic learning in online educational settings. In addition, a new scale has been added that does not appear on other versions of the LASSI. This new scale, the Communication Scale, was added because of the unique ways students, proctors, instructors or tutors interact with one another in online environments. Because it is important that students understand and use these communication methods and tools to be successful, their attitudes and feelings about communicating online are also important contributors to their success.

The focus of the LASSI for Learning Online is on both covert and overt thoughts, behaviors, attitudes, motivations and beliefs that relate to and underlie successful learning in post-secondary online educational and training settings **and** that can be altered through educational interventions. Research has repeatedly demonstrated that these factors contribute significantly to success in college and that they can be learned or enhanced through educational interventions such as learning strategies and study skills courses.

The LASSI for Learning Online is both **diagnostic** and **prescriptive**. It provides standardized scores (percentile score equivalents) and national norms for eleven different scales (there is no total score reported because this is a diagnostic instrument). It provides students with a diagnosis of their strengths and weaknesses, compared to other college students taking online

courses, in the areas covered by the eleven scales. It is prescriptive in that it provides feedback about areas where students may be weak and need to improve their knowledge, strategies, skills, attitudes, motivations and beliefs.

HOW CAN THE LASSI FOR LEARNING ONLINE BE USED?

The LASSI for Learning Online is designed for use as:

- (1) A self-evaluation measure to help students develop greater awareness of their learning and studying strengths and weaknesses in online settings;
- (2) A diagnostic measure to help identify areas in which students could benefit most from educational interventions designed to help them be more successful in online settings;
- (3) A basis for planning individual prescriptions for both remediation and enrichment;
- (4) A means for instructors to use to examine individual students' scores and class trends to help them decide where to place the greatest emphasis for assignments, projects, individual logs, journals, portfolios and other class activities that could help students become more strategic learners when using online instructional materials;
- (5) A pre-post measure to assess progress for students participating in programs or courses focusing on learning strategies and study skills in online settings;
- (6) An evaluation tool to assess the degree of success of intervention courses or programs; and
- (7) An advising/counseling tool for college orientation programs, advisors, developmental education programs, learning assistance programs, and learning centers.

INTRODUCTION TO THE LASSI FOR LEARNING ONLINE SCALES

There are eight items on each of the eleven scales. These eleven scales are: Anxiety, Attitude, Communication, Concentration, Information Processing, Motivation, Selecting Main Ideas, Self Testing, Study Aids, Test Strategies, and Time Management.

Each of these scales is primarily related to one of the three components of strategic learning: **skill**, **will** and **self-regulation**. The conceptual framework of the Model of Strategic Learning underlies each of these components and their associated scale categories so there is some overlap and interaction among and within the components and the individual scales included in each one. However, strategic learners need to know about each of these categories and how to use the information and skills in each category for their own individual advantage. They also need to know how to pick and choose among the various elements in each category to help them reach specific learning goals and objectives. It is the interactions among elements from all three component areas that are crucial to successful strategic learning, transfer of learning, and ultimately, students' academic success, retention, and graduation.

Skill Component of Strategic Learning

The LASSI for Learning Online scales related to the skill component of strategic learning are: **Information Processing**, **Selecting Main Ideas**, and **Test Strategies**. These scales examine students' learning strategies, skills and thought process that are critical for successful learning and performance in online learning contexts. They include identifying, acquiring and constructing meaning for important new information, ideas and procedures, and how students prepare for and demonstrate their new knowledge on tests or other evaluative procedures.

The **Information Processing Scale (INP)** assesses how well students' can use imagery, verbal elaboration, organization strategies, and reasoning skills as strategies to help learn new infor-

mation and skills and to build bridges between what they already know and what they are trying to learn and remember. This is especially important in an online learning environment as students are often required to draw connections between new material and prior knowledge with less help from an instructor than might be available in a traditional, classroom-based, course.

Do students try to relate what they are studying in their online courses to their existing knowledge or past experiences?

Do they try applying what they are studying in their online courses to new tasks or their everyday life?

The **Selecting Main Ideas Scale (SMI)** assesses how well students can identify important information for further study from less important information and supporting details in their online courses. This is particularly necessary in an online learning environment where students often work independently.

Can they pick out the important information while studying online course material?

Can students distinguish between more important and less important information in online course materials?

The **Test Strategies Scale (TST)** assesses students' use of both test preparation and test-taking strategies in their online courses. Effective test performance depends on the strategies used to prepare for and take a test or other form of assessment. This is important in online courses, where testing and assessment situations may be different and perhaps unfamiliar from those in traditional classroom environments.

Do students understand how to adapt their studying to prepare for a test in an online course?

Do they save time after completing a test in an online course to go back and check their answers?

The Will Component of Strategic Learning

The LASSI for Learning Online scales related to the will component of strategic learning are: **Anxiety, Attitude, Communication and Motivation**. These scales measure the degree to which students worry about their academic performance, their receptivity to learning new information, their attitudes and interest in college, their attitudes about communicating with others in online settings, their diligence, self-discipline, and their willingness to exert the effort necessary to successfully complete academic requirements in online settings.

The **Anxiety Scale (ANX)** measures students' apprehension and anxiety about approaching academic tasks in online courses. If students are anxious about an academic task or learning situation their attention will be diverted from the learning opportunity and instead will turn inward to self-concerns, self-criticism or irrational fears. In online settings, students may also exhibit anxiety toward computers in general or computer-based learning activities.

Do students worry that they will flunk their online courses?

Do they feel panicky when they take an important test or other assessment online?

The **Attitude Scale (ATT)** assesses students' general attitudes towards school, online learning, and performing tasks necessary to be successful in online courses and for achieving academic success. Because students' attitudes impact their efforts devoted to self-directed studying and learning, having positive attitudes is particularly important in online environments.

Do students have a positive attitude about completing online lessons?

In general, do they like using a computer to learn new things?

The **Communication Scale (COM)** assesses students' attitudes towards communicating online and using different types of online communica-

tion tools. Often students are not able to meet or communicate with their classmates or instructors face-to-face in online courses; therefore, their attitude towards and their use of these online communication tools could be an important factor in successfully meeting their course objectives.

Do students participate in bulletin board discussions in their online courses?

Do they find it easy to share their ideas with others online?

The **Motivation Scale (MOT)** assesses students' diligence, self-discipline, and their willingness to accept responsibility and exert the effort necessary to successfully complete academic requirements in online courses.

Do students have enough self-discipline to complete the work in online courses?

Are they motivated to complete the work even if they are having difficulty in an online course?

The Self-Regulation Component of Strategic Learning

The LASSI for Learning Online scales related to the self-regulation component of strategic learning are: **Concentration, Self Testing, Study Aids, and Time Management**. These scales measure how students manage, or self-regulate and control, the whole learning process through using their time effectively and efficiently, focusing their attention, maintaining their concentration over time, checking to see if they have met the learning demands for a class, an assignment or a test, and using study supports such as review sessions, online tutors or special help features of online instructional materials.

The **Concentration Scale (CON)** assesses students' abilities to focus and maintain their attention on instructional activities and tasks related to their online courses. Given the limitations on human capacities to process information, if students in online courses become distracted (by their friends, jobs, families, or even

the graphics or pictures on a webpage), they will be less able to self-regulate and focus on the learning tasks.

Do students find it easy to pay attention during online lessons?

Do they find it difficult to maintain their concentration over time while doing their online coursework?

The **Self Testing Scale (SFT)** assesses students' awareness of the importance of self-testing and reviewing, and the degree to which they use these methods in their online courses. Self testing and reviewing are critical for meaningful learning. Its importance is highlighted in online learning situations because students often work independently. In this type of environment, students must guide much of their own understanding of the material and resolve many of their own misconceptions.

Do the students test themselves to be sure they have learned the online course material they have been studying?

When reviewing their online course material do they try to identify potential test questions?

The **Study Aids Scale (STA)** assesses students' use of support techniques, materials or online resources to help them acquire and remember what they are trying to learn. To be more successful, students must know how to use the study aids offered in their online courses as well as how to create their own study aids.

Do students complete practice exercises during online instructional sessions?

Do they create or use graphic organizational aids for learning online course material?

The **Time Management Scale (TMT)** assesses students' use of time management principles for academic tasks. Managing time effectively is an important support strategy for learning in any environment but it is especially important for online learning because students are likely to engage in self-paced study.

Are students well organized in their online courses?

Do they anticipate scheduling problems for completing the work in their online courses?

PART 2: ADMINISTRATION AND SCORING

The LASSI for Learning Online is administered online and takes approximately 12-18 minutes to complete. It is designed to simplify administration and scoring as much as possible without losing power or diagnostic information. To help achieve this goal, it uses a self-report format and does not require any special administration procedures. Additionally, administering the LASSI for Learning Online does not require any specially trained personnel. The directions are included at the beginning of each individual administration. Scoring is completed online and scoring reports are computer-generated.

The LASSI for Learning Online yields 11 individual scale scores, one for each of the 11 scales. No total score is computed since this is a diag-

nostic instrument. These scale scores can then be compared numerically or graphically to the national norms provided, or to local norms or cut-off scores developed by an institution or program. The data provided with the LASSI for Learning Online includes percentile score equivalents. Based on a student's scale scores, either in relation to the national norms included with the instrument or to a percentile cut-off score (75% being a common cut-off used on many campuses), prescriptions can then be made. For example, if a student scores poorly on the Test Strategies Scale, he or she should be advised to concentrate at least part of their efforts on learning more about how to prepare for and take tests. A poor score on the Anxiety Scale indicates a difficulty with focusing atten-

tion on task-relevant thoughts and behaviors rather than on fears and concerns about failure and incompetence. Students who do poorly on this scale would need to learn more about dealing with irrational thoughts and negative self-talk. They would have to learn how to cope with anxiety-arousing stimuli and take more responsibility for the direction of their own thinking processes.

Each LASSI for Learning Online administration contains the following parts: An introduction to the inventory; an explanation of how to complete it; the inventory items; a summary of the students responses coded by scale; scoring summary sheets; and, some information about interpreting individual scale scores. These scores are keyed to the appropriate scale using a 3-letter code (e.g., SMI represents the Selecting Main Ideas Scale).

For each of the 88 items on the LASSI for Learning Online, students are requested to mark the letter that corresponds to how well the statement describes them. For example, marking the letter **a** for an item would indicate that the statement is **not at all typical** of the student, while marking the letter **e** would indicate that the statement was **very much typical** of the student. Students are also cautioned to respond according to how well the statements reflect their behaviors or thinking processes and not how they think they should respond or how others would respond.

To get a better overall view of their performance, students' scale scores are printed on a graph that uses the national norms for each scale. The graph depicts raw scores that were transformed into percentiles so that relative performance in different areas can be assessed. In addition, by using the graph students can also see how their answers compare to the answers of the norm group. The graph is also marked off at the 75th and 50th percentiles to facilitate advising and counseling. Students who score above the 75th percentile often do not need to work on the strategies or skills for that scale. Students who score between the 75th and the 50th percentile on any scale should consider improving the relevant learning and study strategies and skills to optimize their academic performance in online courses. Students who score below the 50th percentile usually need to improve their relevant knowledge and skills in that scale area to increase their chances of succeeding in a post-secondary online setting. It should also be noted that these cut-offs could be modified depending on the local setting or the development of local norms. A copy of the national norms used to create the graph can be found in Appendix D of this user's manual. The data in Appendix D represent the percent of students in the norm group that fall at or below a given raw score for each scale.

PART 3: DESCRIPTION OF THE INDIVIDUAL LASSI FOR LEARNING ONLINE SCALES

ANXIETY (ANX)

Current conceptions of anxiety emphasize the interactive effects of students' own thought processes, beliefs, and emotions and how they affect academic performance in their online courses. Cognitive worry, a major component of anxiety, is manifested in fearful concerns and negative self-referent statements. These negative thoughts, beliefs, and feelings about one's abilities, intelligence, future, interactions with others, or likelihood of success, divert a student's attention away from the task at hand, such as studying for an online course or taking a test. This is especially important for online learning, where students may also exhibit anxiety towards computers in general or computer-based learning activities. If students worry that they will not have time to finish an assignment for their online course, then they could be making matters worse by taking even more time away from the task to worry about their performance. This type of self-defeating behavior often sabotages a student's efforts. If students are tense, anxious, or fearful about studying or their performance in online learning situations, this will divert their attention away from the academic task and inward to self-criticism or irrational fears.

Students' scores on this scale assess how tense or concerned they are when approaching online academic tasks and courses. This is also the only totally reversed scale on the LASSI so students who score low on this measure (indicating high anxiety) need to learn techniques for coping with anxiety and reducing worry so that they can focus on the task at hand and not their anxiety. Many very capable students are often incapable of demonstrating their true level of knowledge and skill because they are paralyzed or distracted by debilitating anxiety. In fact, helping some students learn how to reduce their anxiety is sufficient for helping them to improve

their performance in their online courses. Once these attentional blocks are removed, many students show significant increases in performance.

Coefficient Alpha = 0.85

Sample items:

Even when I am well prepared for a test in my online courses, I feel very anxious.

I become very tense when I study for online courses.

ATTITUDE (ATT)

Students' general attitudes toward their courses and succeeding in school have a great impact on their diligence when studying, particularly in online courses where they are likely to engage in more self-directed study. If the relationships among school and life goals (academic, personal, social and work-related goals) are not clear for students it can be difficult to maintain a mindset that promotes good work habits, concentration, and attention to online courses and course related tasks.

Students' scores on this scale assess their general attitudes and approach for performing the tasks necessary to be successful in online courses. Students who score low on this scale need to work on high-level goal setting and reassess how school and their online courses fit into their future. If their online courses are not seen as relevant to students' life goals and attitudes, then it will be difficult, if not impossible, to generate the levels of motivation, attention, and active information processing needed to help take responsibility for one's own learning and for helping to manage one's own study activities.

Coefficient Alpha = 0.83

Sample items:

I dislike most of the work in my online courses.

I am able to learn effectively from online courses.

COMMUNICATION (COM)

Effective communication is essential to the learning process, especially in online courses where there is little, if any, face-to-face contact between the instructor and students. Communicating with the instructor and other students in an online course can be an important resource for students. For example, if a student becomes confused when studying online course material, discussing the problem with the instructor or other students may be the best way to solve the problem. Students need to feel comfortable contacting these people even though they may have never interacted with them face-to-face. In addition, in many online courses, students are required to communicate online with the instructor and other students.

Students' scores on this scale assess their attitudes and preferences towards communicating online and their use of online communication tools. Students who score low on this measure may need to develop more positive attitudes toward communicating online and they may need to learn more about how to communicate effectively and clearly online. Becoming involved in online discussions or chat sessions, using email, and posting questions on bulletin boards, can help students establish a sense of classroom community that can help them as they study for their online courses.

Coefficient Alpha = 0.71

Sample Items:

I like to use e-mail to communicate with other students in my online courses.

I need to meet face-to-face with other students in my online courses rather than communicating with them online.

CONCENTRATION (CON)

Concentration helps students to focus and maintain their attention on school-related activities, such as studying and working on online course assignments, rather than on distracting thoughts, emotions, feelings, or social situations. People have a limited capacity to process what is going on around them and in their own thoughts; if they are distracted, there will be less capacity to focus on the task at hand. For students this means that distractions, or anything else that interferes with concentration, will divert attention away from tasks related to their online courses.

Students' scores on this scale assess how well they are able to concentrate and direct their attention to school activities and tasks related to their online courses. Students who score high on this measure are effective at focusing their attention and maintaining a high level of concentration. Students who score low on this measure are less successful at focusing their attention on the task at hand by eliminating interfering thoughts, emotions, feelings, and situations. They need to learn techniques to enhance concentration and to set priorities so that they can attend to their online courses as well as to their other responsibilities. Learning techniques for focusing attention and maintaining concentration help students implement effective learning strategies and can make learning and studying both more effective and more efficient.

Coefficient Alpha = 0.86

Sample items:

My mind wanders when I study online course materials.

I find it easy to pay attention during online lessons.

INFORMATION PROCESSING (INP)

Meaningful learning is enhanced by the active use of rehearsal, elaboration and organization strategies. These strategies help to build bridges between what a student already knows or has experienced and what he or she is trying to learn and remember. Using what we already know, that is, our prior knowledge, experiences, attitudes, beliefs, and reasoning skills to help make meaning out of new information is critical to success in educational and training settings. This is especially important in an online learning environment, where students are likely to be required to make connections between new material and prior knowledge on their own, with less help from an instructor than what might be available in a traditional, classroom-based course. The difference between an expert and a novice is not just the amount of knowledge they possess but also, and perhaps even more important, the way that knowledge is acquired and organized. It is the difference between storing one thousand folders by throwing them in the middle of a room versus storing them by some meaningful organization scheme in filing cabinets.

Students' scores on this scale assess how well they can create visual and verbal elaborations and organization schemes to foster understanding and recall of the information they are learning in their online courses. Students who score low on this measure need to learn methods that they can use to help add meaning and organization to what they are trying to learn. These methods range from simple paraphrasing and summarizing to creating analogies, applying or using new information and skills, creating organizational schemes and outlining, and using synthesis, inferential, and analytic reasoning skills. A student who does not have a repertoire of these strategies and skills will find it difficult to incorporate new knowledge and understanding in such a way that acquisition and recall will be effective, often despite a large amount of time spent studying. The effectiveness and efficiency of learning in online courses can be facilitated by the use of information processing strategies.

Coefficient Alpha = 0.85

Sample items:

I make connections among the different ideas or topics I am studying in my online courses.

I try to apply what I am learning to my everyday life.

MOTIVATION (MOT)

The Attitude Scale measures students' general attitudes for succeeding in online courses. Although general attitudes are important, so is a student's motivation to perform the specific tasks related to achievement. The degree to which students are motivated and accept responsibility for studying and for their performance is reflected in the everyday behaviors they exhibit related to their online courses and the academic tasks related to these courses. These behaviors include reading the assigned material, preparing for class or online lessons, finishing assignments on time, and being diligent in studying, even if the topic is not particularly interesting to them (or even trying to figure out ways to make it more interesting).

Students' scores on this scale assess the degree to which they accept responsibility for performing specific tasks related to overall college success and success in online courses. Students who score low on this measure need to work on goal setting, perhaps at the more global levels assessed on the Attitude Scale, but certainly at the more specific level of individual tasks and assignments. Accepting more responsibility for studying and achievement outcomes requires that students learn to attribute much of what happens to them in their online courses to their own efforts rather than to outside causes such as luck or poor teachers, or to uncontrollable forces, such as innate (verses acquired) ability. Accepting more responsibility and attributing success to one's efforts results in more effective studying and academic performance.

Coefficient Alpha = 0.88

Sample items:

I have enough self-discipline to complete the work in online courses.

Even if I do not like an assignment in an online course, I am able to get myself to work on it.

SELECTING MAIN IDEAS (SMI)

Effective and efficient studying requires that students select important material for in-depth attention. Most online lessons, discussions, supplementary textbooks and other materials contain redundant information, extra examples, and many supporting details to help explain what is being taught or presented. A major task in online courses involves separating the important from the unimportant, or even simply didactic, information that does not have to be remembered. If students cannot select the critical information, then the learning task becomes complicated by the huge amount of material they are trying to acquire. Lacking this skill also increases the likelihood that students will not have enough time to study everything that must be covered.

Students' scores on this scale assess their skills at selecting important information to concentrate on for further study in their online courses. Students who score low on this measure need to learn more about how to identify important information in an online course so that they can focus their attention and information processing strategies on appropriate material.

Coefficient Alpha = 0.85

Sample items:

In an online course, it is easy for me to decide what I need to include in my notes.

When studying online course material, I seem to get lost in the details and miss the important information.

SELF TESTING (SFT)

Reviewing and testing one's level of understanding are important for knowledge acquisition and comprehension monitoring. These strategies both support and contribute to meaningful learning and effective performance. Without them, learning could be incomplete or errors might persist undetected. Reviewing and self testing also contribute to knowledge consolidation and integration across topics. Using mental reviews, going over notes and course materials, thinking of potential questions to guide reading or help prepare for an exam are all important methods for checking understanding, consolidating new knowledge, integrating related information (both from what is being learned and from what is already known), and deciding if additional studying is needed. Self testing can be extremely important in an online learning environment where students are likely to be working independently much, if not all, of the time; it is up to the students to check for misconceptions and understanding of the material.

Students' scores on this scale assess their awareness of the importance of self testing and reviewing and the degree to which they use these methods in their online courses. Students who score low on this measure need to learn more about the importance of self testing as well as specific methods for reviewing material in their online courses and monitoring their comprehension. These methods include structured reviews of individual study segments; asking questions before, during, and after reading, studying, or completing an online lesson; trying to use new information in novel ways; trying to apply a principle or method; and using a systematic approach to studying and learning online.

Coefficient Alpha = 0.83

Sample items:

I stop periodically while completing an online lesson and mentally go over and review what was presented.

I try to identify potential test questions when reviewing my online course material.

STUDY AIDS (STA)

Students need to know how to create their own study aids and how to use those created by others. This is especially critical in online learning environments where students are likely to be working independently. For example, online course or textbook authors (or publishers) will often use headings, special type, white space, special markings, summaries, and statements of objectives to help students learn from their materials. Many also provide links to additional websites or supplemental materials to help students learn the material. However, unless students know how to recognize and use these hints and aids, they will not benefit from them. It is also important for students to know how to generate their own study aids using methods such as creating diagrams, summarizing text, creating charts or topic summary sheets, and trying to explain the material to another student. There are other supplementary activities that also support and enhance meaningful learning such as attending group review sessions, participating in online discussions, contacting the instructor, searching for related material on the Web, forming study groups, or comparing notes with other students to check for accuracy or completeness.

Students' scores on this scale assess their ability to use or create study aids that support and increase meaningful learning and retention. Students who score low on this scale may need to learn more about the types of study aids provided in educational materials for their online courses and how to create their own study aids. Using and creating study aids improves both the effectiveness and efficiency of online learning.

Coefficient Alpha = 0.69

Sample items:

I try to find a study partner or study group for my online courses.

I use the titles and headings in my online lessons as a guide to study the material.

TEST STRATEGIES (TST)

Effective test performance depends on both preparation strategies and test taking strategies. A student needs to know how to prepare for the type of performance that will be required and how to maximize that performance. This is especially important in online courses where testing situations may be different than those the student has experienced before in traditional classroom-based environments. Test preparation includes knowing about the type of tests and assessments students will be taking. For example, is it going to be a short-answer or a multiple-choice exam? Will performance require simple recall or will concepts, principles, and ideas need to be applied? Test preparation also includes knowing about methods for studying and learning the material in a way that will facilitate remembering the material and using it at a later time. Test taking strategies include knowing about the characteristics of tests and test items, and how to create an effective test taking plan.

Students' scores on this scale assess their use of test preparation and test taking strategies in online courses. Students who score low on this measure may need to learn more about how to prepare for tests, how to create a plan of attack for taking a test, the characteristics of different types of tests and test items, and how to reason through to an answer. Often, students' performance on a test is not an accurate indicator of what they have learned. Knowing about test preparation and test taking strategies and how to use them in their online courses helps students target their study activities, set up useful study goals, implement an effective study plan, and demonstrate their knowledge and skill acquisition so it can be accurately evaluated.

Coefficient Alpha = 0.72

Sample items:

When I prepare for a test in an online course, I have trouble figuring out what to do to learn the material.

When taking a test, I am unable to summarize what I have studied in an online lesson.

TIME MANAGEMENT (TMT)

Managing time effectively is an important self-regulation strategy for learning in any environment. However, time management is critical for online learning because students are likely to engage in self-paced study. Most students have various demands on their time; only by creating realistic schedules and using them can they set priorities and try to fit in everything they want to do. Creating and using schedules also encourages students to take more responsibility for their own behavior. It requires some knowledge about themselves as students and learners in online educational settings. What are their best and worst times of day to study for their online courses? Which subjects are easier or harder for them? What are their preferences for learning methods? This type of knowledge and self-awareness helps students create workable schedules, and perhaps even more important, it helps students to create the motivation to use them.

Students' scores on this scale indicate the degree to which they create and use schedules to manage their time. Students who score low on this scale may need to learn about how to create a useful schedule and how to deal with distractions, competing goals, and procrastination. Accepting more responsibility for studying and achievement outcomes requires that students set realistic academic goals and create plans that will facilitate goal achievement. Effective time management enhances these activities.

Coefficient Alpha =0.86

Sample items:

I put off studying for online courses more than I should.

I spread out my study times for my online courses so I do not have to "cram" for a test.

PART 4: THE DEVELOPMENT OF THE LASSI FOR ONLINE LEARNING

The developmental work that led to the creation of the LASSI for Learning Online began in January 2001 as part of the Cognitive Learning Strategies Project at the University of Texas at Austin. The LASSI for Learning Online was developed to:

1. Create a LASSI for use with the increasing numbers of learners in online settings. To this end, new field test items were created (50 items), including items for the new Communication Scale, and existing items from the LASSI, 2nd Edition, were modified for online settings (55 items) or used for the new measure with none or only minor changes (21 items); primarily for the Anxiety Scale.

2. Incorporate current research findings on the role of strategic learning factors in technology-rich and online learning environments. For example, a greater emphasis was placed on the role of students' increased need for self-regulation in these environments.

3. Incorporate changes in educational practice and instruction in higher education. For example, all scales were updated to reflect strategic learning factors in typical online learning environments.

4. Broaden the scope of the scales to increase the degree to which they appropriately sample the underlying domains, given the online learning context. For example, the Study Aids Scale

samples more broadly from the domain of specific tasks required of learners in online learning settings.

5. Establish sound psychometric properties. For example, the lowest Coefficient Alpha for any scale on the LASSI for Learning Online is now 0.69, and all but two scales are above 0.83.

6. Create national norms generated from a broad-based sample of online learners (N = 679). (Note: This sample will be expanded over time and the norming process will continue.)

EARLY DEVELOPMENTAL ACTIVITIES

The initial task in this project consisted of a review of relevant research, learning assistance materials, and websites with regard to students' learning in online settings. In addition, a series of interviews was conducted with professionals in developmental education, educational psychology, and instructional technology that had either worked with or conducted research about students in online learning settings in higher education, broadly defined. The data from the literature review and interviews helped us to identify criteria both for the modification of the LASSI, 2nd Edition, and for the development of new items for the LASSI for Learning Online. Finally, feedback was solicited from educational psychometricians with expertise in diagnostic/prescriptive assessments.

DEVELOPMENT OF AN ITEM POOL

Using the data gathered during the early developmental activities, as well as a number of pilot tests, a final item pool was created. These items included those that were created specifically for the LASSI for Learning Online (50 items) which

included items for the new Communication Scale), existing items from the LASSI, 2nd Edition which were modified for online settings (55 items), and items from the LASSI 2nd Edition used for the new measure with no or only minor changes (21 items) primarily used for the Anxiety Scale). A team of developmental educators, instructors, educational psychologists, instructional technologists, and psychometricians examined this initial pool of 126 items. As a result of their input, a number of modifications were made: the wording of some of the items was changed, a number of items were removed, and new items were created to replace some of the discarded ones. After a series of reviews, the items were randomly sorted to create a field test version of the instrument.

FIELD TESTING AND NORM DEVELOPMENT

The final field testing and norming version of the LASSI for Learning Online contained extra items for each scale (only 88 of the 111 items field tested were needed for the final instrument). The field test/norming version was administered to 679 students from 2 prototypical higher education institutions. Balancing both conceptual and psychometric analyses, eleven scales of eight items each were developed using those items that best represented the breadth and depth of the conception underlying each scale and that provided the strongest psychometric properties for the scale. Summaries of the item statistics for each of the LASSI for Learning Online scales can be found in Appendix A (Tables 1-25). Appendix B contains a summary of the individual scale statistics (mean, standard deviation, and Coefficient Alpha) and Appendix C contains the inter-scale correlations for all scales. Appendix D contains a listing of the norms for the LASSI for Learning Online Scales.

Appendix A: Descriptions of the Field Test and Norming Sample (Tables 1-25)

Table 1

LASSI for Learning Online Norming-Sample Demographics
Sample Size by Type of Institution

	Number of Schools	Number of Students
University	4	335
Community College	1	109
State College	2	59
Total	7	503

Table 2

LASSI for Learning Online Norming-Sample Demographics
GPA by Gender

GPA	Male	Female	Total
Below 2.5	26	21	47
2.5 - 3.0	63	88	151
3.0 - 3.5	52	85	137
3.5 - 4.0	43	87	130
Total	184	281	465

Table 3

LASSI for Learning Online Norming-Sample Demographics
Ethnicity by Gender

Ethnicity	Male	Female	Total
White, non-Hispanic	108	187	295
African-American	6	23	29
Hispanic	108	59	112
Asian or Pacific Islander	11	9	20
Other	7	13	20
Grand Total	240	291	476

Table 4

LASSI for Learning Online Norming-Sample Demographics
Age by Gender

Age	Male	Female	Total
17-18	19	29	48
19-20	101	134	235
21-22	24	37	61
23-24	17	20	37
25 or older	35	85	120
Total	196	305	501

Table 5

LASSI for Learning Online Norming-Sample Demographics
Ethnicity by Age

Ethnicity	17-18	19-20	21-22	23-24	25 or older	Total
White, non-Hispanic	22	127	32	19	95	295
African-American	6	18	3	1	1	29
Hispanic	15	55	19	12	11	112
Asian or Pacific Islander	1	14	3	2	0	20
Other	1	8	2	0	9	20
Total	45	222	59	34	116	476

Table 6

LASSI for Learning Online Norming-Sample Demographics
Ethnicity by GPA

Ethnicity	Below 2.5	2.5 - 3.0	3.0 - 3.5	3.5 - 4.0	Total
White, non-Hispanic	25	73	96	93	287
African-American	3	13	4	4	24
Hispanic	17	50	18	13	98
Asian or Pacific Islander	1	3	3	13	20
Other	0	6	8	3	17
Total	46	145	129	126	446

Table 7
LASSI for Learning Online Norming-Sample Demographics
GPA by Age

GPA	17-18	19-20	21-22	23-24	25 or older	Total
Below 2.5	5	27	8	3	4	47
2.5 - 3.0	14	74	27	12	24	151
3.0 - 3.5	13	59	12	13	40	137
3.5 - 4.0	10	57	11	5	47	130
Grand Total	42	217	58	33	115	465

Table 8
LASSI for Learning Online Norming-Sample Demographics
Ethnicity by GPA — Males

Ethnicity	Below 2.5	2.5 - 3.0	3.0 - 3.5	3.5 - 4.0	Total
White, non-Hispanic	12	27	37	29	105
African-American	1	3	0	0	4
Hispanic	12	26	8	4	50
Asian or Pacific Islander	0	0	2	9	11
Other	0	4	2	1	7
Total	25	60	49	43	177

Table 9
LASSI for Learning Online Norming-Sample Demographics
Ethnicity by GPA — Females

GPA	Below 2.5	2.5 - 3.0	3.0 - 3.5	3.5 - 4.0	Total
White, non-Hispanic	13	46	59	64	182
African-American	2	10	4	4	20
Hispanic	5	24	10	9	48
Asian or Pacific Islander	1	3	1	4	9
Other	0	2	6	2	10
Total	21	85	80	83	269

Table 10

LASSI for Learning Online Norming-Sample Demographics
Age by GPA — Males

Age	Below 2.5	2.5 - 3.0	3.0 - 3.5	3.5 - 4.0	Total
17-18	4	5	5	4	18
19-20	14	34	25	23	96
21-22	6	7	7	3	23
23-24	1	6	6	1	14
25 or older	1	11	9	12	33
Total	26	63	52	43	184

Table 11

LASSI for Learning Online Norming-Sample Demographics
Age by GPA — Females

Age	Below 2.5	2.5 - 3.0	3.0 - 3.5	3.5 - 4.0	Total
17-18	1	9	8	6	24
19-20	13	40	34	34	121
21-22	2	20	5	8	35
23-24	2	6	7	4	19
25 or older	3	13	31	35	82
Total	21	88	85	87	281

Table 12

LASSI for Learning Online Norming-Sample Demographics
Ethnicity by Age — Males

Ethnicity	17-18	19-20	21-22	23-24	25 or older	Total
White, non-Hispanic	9	55	12	6	26	108
African-American	0	6	0	0	0	6
Hispanic	9	24	8	8	4	53
Asian or Pacific Islander	0	8	2	1	0	11
Other	0	2	1	0	4	7
Total	19	101	24	17	35	196

Table 13
LASSI for Learning Online Norming-Sample Demographics
Ethnicity by Age — Females

Ethnicity	17-18	19-20	21-22	23-24	25 or older	Total
White, non-Hispanic	13	72	20	13	69	187
African-American	6	12	3	1	1	23
Hispanic	6	31	11	4	7	59
Asian or Pacific Islander	1	6	1	1	0	9
Other	1	6	1	0	5	13
Total	27	127	36	19	82	291

Table 14
Item Statistics for the Anxiety Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
10	2.771	1.250	0.669	0.549	0.831
18	2.801	1.312	0.754	0.651	0.818
31	3.356	1.185	0.725	0.626	0.822
42	3.944	1.336	0.658	0.525	0.834
47	3.636	1.096	0.655	0.549	0.831
67	3.598	1.163	0.741	0.648	0.819
70	2.847	1.282	0.622	0.487	0.839
76	3.672	1.303	0.730	0.621	0.822

Table 15
Item Statistics for the Attitude Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
14	3.754	1.251	0.690	0.559	0.806
26	3.650	1.190	0.724	0.611	0.798
35	3.541	1.130	0.806	0.725	0.783
40	4.131	1.031	0.642	0.527	0.810
53	3.765	1.185	0.824	0.745	0.779
57	3.022	1.271	0.632	0.482	0.818
61	3.622	1.106	0.705	0.596	0.801
64	4.135	1.032	0.335	0.176	0.850

Table 16
Item Statistics for the Communication Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
1	2.706	27.682	0.340	0.175	0.697
4	3.765	28.498	0.322	0.299	0.699
16	2.197	27.389	0.460	0.306	0.670
39	2.626	27.295	0.435	0.230	0.674
44	3.127	26.283	0.450	0.325	0.671
73	3.002	26.450	0.501	0.315	0.660
81	3.581	30.125	0.279	0.173	0.705
84	2.563	27.873	0.425	0.306	0.677

Table 17
Item Statistics for the Concentration Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
2	3.942	0.999	0.579	0.450	0.857
7	3.686	1.163	0.735	0.623	0.839
21	3.296	1.089	0.700	0.586	0.843
34	3.453	1.119	0.759	0.659	0.834
49	3.734	0.915	0.709	0.619	0.840
56	3.706	1.026	0.692	0.584	0.843
59	3.348	1.062	0.788	0.704	0.829
71	3.253	0.991	0.701	0.600	0.841

Table 18
Item Statistics for the Information Processing Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
9	3.843	0.978	0.545	0.411	0.855
13	3.682	1.031	0.602	0.470	0.849
20	3.306	1.135	0.734	0.623	0.831
38	3.274	1.020	0.719	0.617	0.832
55	3.093	1.016	0.653	0.535	0.841
58	3.523	1.039	0.781	0.695	0.822
78	3.177	1.116	0.785	0.692	0.822
86	3.404	0.993	0.780	0.699	0.822

Table 19
Item Statistics for the Motivation Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
11	3.708	1.068	0.705	0.602	0.864
19	3.302	1.117	0.544	0.399	0.886
28	3.952	0.946	0.809	0.746	0.851
32	3.948	1.055	0.778	0.697	0.854
41	3.791	1.167	0.799	0.714	0.852
46	3.759	1.093	0.803	0.725	0.851
65	3.789	1.065	0.721	0.622	0.862
80	3.992	1.031	0.711	0.613	0.863

Table 20
Item Statistics for the Selecting Main Ideas Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
6	3.447	1.008	0.672	0.553	0.835
12	3.708	1.102	0.654	0.515	0.841
22	3.708	0.970	0.719	0.617	0.827
30	3.388	1.029	0.696	0.579	0.832
63	3.241	1.006	0.660	0.538	0.837
68	3.420	0.962	0.747	0.653	0.823
72	3.587	0.921	0.742	0.652	0.824
79	3.604	0.960	0.705	0.601	0.829

Table 21
Item Statistics for the Self Testing Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
8	2.795	1.129	0.705	0.586	0.810
17	2.978	1.076	0.671	0.550	0.815
23	3.262	0.957	0.629	0.514	0.820
36	2.952	1.083	0.761	0.665	0.800
45	2.229	1.117	0.633	0.497	0.822
52	3.036	1.071	0.720	0.613	0.807
75	3.153	1.076	0.629	0.497	0.822
87	2.783	1.146	0.687	0.561	0.814

Table 22
Item Statistics for the Study Aids Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
3	2.988	1.368	0.534	0.313	0.678
24	2.537	1.274	0.581	0.388	0.658
27	3.431	1.174	0.563	0.384	0.659
33	3.561	1.090	0.562	0.398	0.656
43	2.251	1.232	0.500	0.298	0.679
50	2.915	1.182	0.622	0.456	0.642
66	2.648	1.171	0.595	0.424	0.650
82	3.362	1.020	0.553	0.399	0.657

Table 23
Item Statistics for the Test Strategies Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
5	3.871	1.077	0.476	0.277	0.720
15	3.831	1.077	0.598	0.425	0.689
25	3.670	0.979	0.610	0.458	0.683
54	3.604	1.043	0.640	0.484	0.676
62	3.600	0.983	0.652	0.509	0.672
69	3.817	1.187	0.456	0.231	0.734
74	3.581	1.010	0.694	0.559	0.661
85	3.587	0.966	0.559	0.398	0.694

Table 24
Item Statistics for the Time Management Scale

Item Number	Item Mean	Standard Deviation	Item-Total r	Item-Total r Excluding This Item	Coefficient Alpha Excluding This Item
29	3.726	1.142	0.689	0.579	0.849
37	3.064	1.206	0.749	0.649	0.841
48	3.857	1.106	0.612	0.489	0.859
51	3.370	1.168	0.722	0.619	0.845
60	3.014	1.121	0.724	0.626	0.844
77	3.523	1.109	0.656	0.543	0.853
83	3.322	1.152	0.754	0.661	0.840
88	3.088	1.199	0.793	0.708	0.834

Table 25
 Scale Statistics for the Final Version of Each Scale

Scale Name	Scale Mean	Standard Deviation	Coefficient Alpha
Anxiety	26.63	6.89	.85
Attitude	29.62	6.20	.83
Concentration	28.42	5.94	.86
Communication	23.56	5.89	.71
Information Processing	27.30	5.85	.85
Motivation	30.24	6.26	.88
Selecting Main Ideas	28.10	5.55	.85
Self Testing	23.19	5.89	.83
Study Aids	23.69	5.36	.69
Test Strategies	29.56	4.85	.72
Time Management	26.96	6.57	.86

LASSI for Learning Online Inventory

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User's Manual

This User's Manual includes a history of the instrument's development, a complete description of the eleven scales, a section on administration and scoring, results of pilot and field testing, scale statistics, norms, and the processes used in scale construction. In addition, it contains information to help create individual prescriptions for enhancing students' skills.

Ordering Information

Complete information on ordering **LASSI FOR LEARNING ONLINE** is available from:

H&H Publishing Company, Inc.
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