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ABSTRACT

The Student as Learner Inventory, which was developed at Alverno College (Wisconsin), is described. Alverno College is a private, 4-year liberal arts college for women with an enrollment of 2,500 students. The inventory, which is completed by entering and second semester students in an undergraduate program, is integral to the curriculum. The inventory is part of a New Student Seminar and involves: self-reflection by students on their development as learners; support for discussions by student, advisor, and instructor concerning learning issues; and identification of students "at risk" for attrition. Teachers bring students into a conversation about their learning perspective in relation to what will make them effective as learners in the curriculum. Consideration is given to: the rationale for research in a curriculum context; the contextual validity of the learning statements in the inventory; collaboration among researchers, instructors, and advisors; reframing validity as research and instruction are combined; the value of putting learning ahead of research and measurement goals; integration of research and measurement with instruction; use of qualitative and quantitative responses to interpret student responses to the inventory; measurement perspectives on score uses; items specific to the local context and philosophy of learning; and inventory revision based on statistical techniques and informed judgment. The inventory is appended, along with an educator's guide to the inventory. (Contains 34 references.) (SW)

Integrating Teaching, Advising, and Research Tools

The Student as Learner Inventory as Retention and Learning Intervention

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ALVERNO COLLEGE
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Paper presented at the annual meeting of the Association for Institutional Research, Boston, May 30, 1995

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Jean Endo
Editor
AIR Forum Publications

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INTEGRATING TEACHING, ADVISING, AND RESEARCH TOOLS: THE STUDENT AS LEARNER INVENTORY AS RETENTION AND LEARNING INTERVENTION

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ABSTRACT

A locally developed learning inventory—completed by entering and second semester students in an undergraduate program and integral to the curriculum—integrates several purposes: 1) self-reflection by students on their development as learners, 2) support for student/advisor/instructor discussions on learning issues, and 3) identification of students "at risk" for attrition.

SETTING

Alverno College is a private four-year liberal arts college for women in Milwaukee, Wisconsin, with 2,500 degree students enrolled in either a weekday or weekend time frame. Generally, students are from southeastern Wisconsin, are first-generation college students, and work during and after college. Currently, 72% are Caucasian, 15% are African-American, and 13% are of other cultural backgrounds. Overall, 88% of Alverno incoming students are retained after their first year, with the comparable statistic just for minority students at 80%.

Since 1973, graduation from Alverno has required students to demonstrate eight abilities to an explicit level of effectiveness in the context of disciplinary or professional content: communication, analysis, problem solving, valuing in decision making, social interaction, global perspectives, effective citizenship, and aesthetic responsiveness. Faculty have determined and taught these abilities in general education courses and in a variety of disciplines. They have made them explicit through criteria and assessed them in multiple modes and contexts through their student performance assessment system. Alverno has tested these abilities by collaborating with many other institutions and their faculty through a variety of consortia that cross the educational spectrum from elementary to professional schools (Consortium for the Improvement of Teaching, Learning, and Assessment, 1992).

INTRODUCTION

The Integration of Instruction and Research Purposes

In our development of an inventory that addresses how students understand their learning, we have constantly held ourselves to the standard of making this inventory meet the immediate teaching and learning purposes of students, instructors, and advisors. Moreover, we held ourselves to this standard before we could hope to have what would be considered a diagnostic inventory that statistically profiled the student as learner. So, we began with the rather simple idea that completing the inventory about learning had to be a learning experience for the student.

All along we have also had a more long-range goal of using the inventory to collect data that would enlarge our institutional understanding of the development of students as learners in the College's curriculum. However, we have held each administration of the instrument, even those aimed at its development as a research tool, to the standard of immediate student learning from the experience of completing the inventory. As a result of keeping this requirement for learning paramount, we have created a different kind of inventory. This paper is about how the Student As Learner Inventory has become integrated into our practice, how it has become a tool for both diagnosing and simultaneously intervening around learning issues that may put students "at risk" of attrition, and about how the inventory has become a seminal learning experience for students, as well as meeting some of our research goals. The paper is neither a chronology nor an exhaustive history. In particular, we do not review the extensive research that articulated the models. Instead, we try to illustrate the meaning of the integration of research and pedagogy in the development and use of the inventory, including its application to student retention, by discussing the ideas that emerged from the attempt to accommodate these multiple purposes.

The inventory is different in many ways from most other inventories. As we will show, the way we create "scores" is different, and how we interpret them is different. We did not start out looking for these differences. We did, however, intend to focus on articulating an institutional understanding of how students develop as learners in the curriculum, which we saw as distinctive. And so, we readily acknowledge that the inventory embodies a view on learning that is located within a specific curriculum (Alverno College Faculty, 1976, rev. 1985, 1992) and its corresponding educational principles.

The faculty continue to develop the curriculum and their understanding of teaching, learning, and assessment through their research and practice-based experience (Diez, Rickards, & Lake 1994; Loacker, 1988; Alverno College Research and Evaluation Committee, Office of Research and Evaluation, and Additional Faculty and Staff, 1993; Riordan, 1993). This reflective practice is also informed by institutional and program assessment (Mentkowski, 1994) which broadens research and evaluation of the curriculum (Mentkowski, 1988; Mentkowski & Doherty, 1983, 1984; Mentkowski , Rogers, Deemer, Ben-Ur, Reisetter, Rickards, & Talbott, 1991). Out of its reflective practice, the College has developed a curriculum and a shared perspective on student learning, development, and abilities that is distinctively its own (Alverno College Faculty, 1976, rev. 1985, 1992; Alverno College Faculty, 1979, rev. 1985, 1994). While the particulars of this shared perspective are the achievements of a particular community of educators, many of its underlying principles are widely shared (Consortium for the Improvement of Teaching, Learning, and Assessment, 1992). It is beyond the scope of this paper to describe fully this shared perspective. However, the Student as Learner Inventory (see Appendix A) is itself intended to both reflect and communicate this shared perspective on the development of learners in Alverno's ability-based curriculum.

A Broad Rationale For Research In a Curriculum Context

Many frameworks are available for understanding student development, learning, and retention. In particular, Tinto (1993) has developed a generalizable model of components that affect student retention. Research in this model has clarified that students' integration into both the academic and social life of college contributes to retention. In Tinto's model, integration involves the interaction of the college's system, with the individual student. Understanding how students become academically integrated into college can be inferred from the literature on factors that affect student learning and development, for example, the impact of students' level of involvement or quality of effort (Astin, 1991; Pace, 1984; Pascarella, 1985). Perry's (1970) work on the intellectual and ethical development of college students continues to provide a framework for understanding

how college students change their conceptualization of knowledge and learning and how this impacts their relationship to college instruction (see Reisetter Hart, Rickards, & Mentkowski, 1995). Kolb's (1984) theory of experiential learning likewise offers insight into how different learning styles relate to different instructional strategies (see Hutchings & Wutzdorff, 1988).

These models of learning, along with Tinto (1993), suggest that academic integration is a complex phenomenon arising from the interaction between student learning characteristics and educational practices (see Riordan, 1993). Cross-institution models and instrumentation can provide useful frameworks and tools. At the same time, institutionally-designed instruments based on the study of a college's own student body in the context of the institution's mission and educational philosophy have the potential to contribute to a more usable picture of students and their experiences, as well as to the development of an institutional perspective on educational principles (Mentkowski, Astin, Ewell, & Moran, 1991).

In the process of developing instrumentation around the learning frameworks of students in the curriculum, an institution may have a greater potential for uncovering sources of student difficulty in academically integrating with the curriculum. Instrumentation that directs students and faculty specifically to frameworks for performance within the curriculum would seem to have the potential to more seamlessly contribute to faculty and student understanding of student academic experiences. Thus, Rogers (1988) has observed that the contextual validity of assessment instruments and research and evaluation practices are critical to their success (cf. Wiggins, 1993). In this spirit, the *Student As Learner Inventory* was developed by integrating Alverno's extensive longitudinal research on student perspectives on their learning with faculty deliberation on student development in the curriculum.

The Contextual Validity of the Original Learning Statements

Between 1976 and 1980, the college's Office of Research and Evaluation conducted extensive longitudinal interviews with a sample of students as they moved through the curriculum (Much & Mentkowski, 1982. 1984). It is beyond the scope of this paper to review this research. Nonetheless, the research based on these interviews provides a fundamental record of students' own constructions of their development as learners. This weights the student perspective in the inventory. With this base of research into student constructions in support of a deliberative process, the Assessment Council (a committee of senior faculty with responsibility for overseeing assessment on campus) developed a portrait of performance characteristics for beginning, developing, and advanced learners. This faculty-developed narrative description of the student's development of Six Characteristics of Performance (integration, independence, creativity, commitment, awareness of capability, and habituality) further elucidates the development of students as learners in the ability-based curriculum. Except to the degree that they overlapped with the eight curriculum abilities that students were taught and assessed for (communication, analysis, problem solving, valuing in decision making, social interaction, effective citizenship, global perspectives, and aesthetic responsiveness) the Six Characteristics of Performance were not specifically required of students. Mentkowski and Strait (1983) demonstrated that when faculty rated students on these six characteristics a single underlying "developmental" factor accounted for the variance in faculty ratings. They found that this ratings-based factor was related to external measures of student development.

Rogers (1988) documents subsequent interactive processes where faculty identified further behavioral descriptors of the Six Characteristics. These behavioral descriptors expanded the original item pool and sharpened the picture of the developing learner from the faculty perspective. At the same time, the

Office of Research and Evaluation reviewed the analysis of the longitudinal interviews of student perspectives on their learning and thereby provided items with language congenial to student understandings. This provided an independent analytic framework for describing student development of themselves as learners. The Office of Research and Evaluation integrated this analysis with the results of the faculty generation of descriptive statements of the Six Characteristics and previous definitions to produce multi-item rating forms. The Student as Learner Inventory is a subsequent inventory developed for use with students, using these items and conceptual understandings as its base of development.

OVERVIEW OF THE STUDENT AS LEARNER INVENTORY

Purposes, Uses, and Description of the Inventory

Alverno College developed the *Student As Learner Inventory* as a multipurpose instrument administered to students in the context of their learning in the curriculum. It connects the college's extensive research on student constructions of their learning and development (see Mentkowski, 1988) with a strategy for students to self-reflect on their performance in the curriculum, while providing data for research at the level of the institution. The inventory was introduced for student use in 1986, with major revisions in 1991 and 1994.[1] Faculty envisioned and developed the inventory for use within an introductory seminar taken by all non-transfer students in the weekday time frame as another way to invite students to self-reflect on the ability-based curriculum and the expectations of the college for them as learners. Instructors and advisors have continuously used it to support student learning and integration into the college since 1986. The instrument measures students' adjustment to the academic requirements of college and is also an integral part of the teaching-learning process. As such, it simultaneously informs students, teachers, and advisors about learning issues and supports conversations with students about their role as learners. More recently, the capacity of the inventory to both identify students "at risk" as learners in the college and to support an intervention with students that supports their retention has become an emergent purpose of the inventory.

Long-standing purposes for learning
- Student self-reflection on their development as learners in the college
- Socializing the students into the college's philosophy of self-directed learning
  - — items *were* interspersed with commentary reflecting a faculty perspective on learning
  - — discussions facilitate student development as learners

Emergent retention purposes
- Supporting retention through discussion with students about their individual learning issues
- Identifying students most "at risk" as learners in the college

Since 1986 the inventory has been administered in New Student Seminar. This is a course taken by all non-transfer students in the Weekday College time frame and provides an in-depth orientation to college learning. Completion of the inventory is integral to how students' reflectively integrate their learning in the course. As of 1994, the inventory is also administered in

[1] The first author, as Coordinator of New Student Seminar, has envisioned and overseen the use of the inventory as an instructional device. From 1985 to present, she has been a leader in its conceptualization and revision.

Preprofessional Seminar. This is a course taken by all non-transfer students in their second semester, with the exception of nurses who take a nursing specific version of the course. In this credit course, the student develops and explores her interests, her pattern of dealing with others, and her dominant personality themes, as well as her learning and work styles.[2] The readministration of the Student as Learner Inventory offers the student another opportunity to reflect on her learning.

Description of the current instrument
- 73 sentence stems eliciting self-ratings
- Self-rating on how characteristic the stem is of their performance as a learner
  1 Not characteristic
  2 Partly characteristic
  3 Characteristic
- A self-reflective essay on their learning

Since 1986, the Student as Learner Inventory has been comprised of sentence stems that elicit a self-rating on how characteristic a statement is of the student's learning and a self-reflective essay on their learning. The inventory advises students that "something may be "characteristic of your performance" either because you usually do it or because it describes your thinking or feeling as you perform." The current version has 73 self-rating items (see Appendix A). Each item has three values "*not characteristic*," "*partly characteristic*," and "*characteristic.*" When administered in Preprofessional Seminar, only reflection topic number ten, "committing to professional goals," is used to elicit a self-reflective essay (see Appendix A).

The ten sections of the inventory present an overview of students as learners at the college (see Figure 1). The sequence of categories and the category names, as well as the items themselves, are intended to introduce students to a philosophy of how they can develop as lifelong-learners (cf. Rogers, 1988). The "inventory sections and reflection topics" (see Appendix A) help reinforce for the student a vision of how they will develop as independent learners through self-assessment and feedback, so that they develop their own perspective, understand multiple perspectives and establish meaningful career goals. The section names (see Figure 1) are not intended to be the basis for the development of subscales.

- College work and independent learning
  - committing to college work
  - becoming independent in learning
  - self-assessment
  - using feedback and assessment criteria
  - commitment to improve
  - understanding Alverno's integrated learning process
- Personal development
  - developing one's own perspective and being creative
  - applying concepts
  - taking multiple points of view
  - committing to professional goals

Figure 1: Sections of the Student As Learner Inventory as Pedagogy

[2] Through interviews with local professionals, she gathers information that enables her to explore and select a chosen field of study.

Rationale Supporting the Construction of the Inventory

The Student as Learner Inventory relies on student's constructions of their own learning as the primary source of the understanding of learning that it portrays in the item statements. The rationale is that students who are "learning to learn" as they enter the college will do that more effectively if they can relate to an understanding of learning that reflects how prior students actually experienced and understood learning. Thus, the inventory relies primarily on the student's perspective on learning, as it developed over time in interaction with a faculty-designed coherent curriculum. Because the inventory is based on individual, longitudinal interviews during the college years at Alverno, it reflects ways of learning that move from beginning to advanced understandings within the curriculum.

The development of the inventory is extended by faculty constructions of learning that mirror the educational assumptions and learning principles that ground the curriculum, and therefore, the learning experiences that are designed for students across their college years. It also mirrors faculty-developed characteristics of student performance, that are not required for graduation, but that faculty teach toward in many kinds of ways through the formal curriculum and through their daily interactions with students. In that sense, the Student as Learner Inventory is an opportunity for students to experience faculty constructions side-by-side with student constructions. It organizes the statements or items in such a way that the items themselves reflect a perspective on learning and its development that evolved from the longitudinal interviews and the faculty's goals for the student as learner. Thus, the inventory is another way that the environmental press for learning is communicated to students—by prior students and by faculty.

Collaboration Among Researchers, Instructors, and Advisors

The Office of Research and Evaluation[3] has been the "administrative home" of the inventory and its development, with responsibility for coordinating the development and use of the instrument. The faculty's Assessment Council[4] was particularly instrumental to the early development of the inventory.

The ongoing development of the inventory is also a shared responsibility (see Figure 2). Across its nine years of use, this development has involved the continuous collaboration of researchers and faculty. Figure 2 details the extent of the collaboration among departments and identifies the authors in their roles. In addition, the administrative heads of these departments and committees fully supported this work.[5] Many individuals in diverse roles across the campus have substantively contributed. In particular, the users of the inventory (course instructors and advisors) have also assumed important roles in

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[3] Marcia Mentkowski is the Director of this office. She envisioned the development of the student constructions as the basis for inventory items and helped guide the early development of the inventory. Office of Research and Evaluation consultant, Nancy Much, provided support. William Rickards has also played an instrumental role in developing cross-department conversations around the use of the inventory.

[4] The Assessment Council is a faculty led committee, chaired by Georgine Loacker. The 1986 "student-as-learner subcommittee" reviewed and revised the inventory items (Kathleen Bultman, Wendell Kringen, Georgine Loacker, Marcia Mentkowski, Glen Rogers, and Christine Trimberger).

[5] Other administrators and committee chairs in positions not mentioned above are: Marlene Neises, (Executive Director, Academic Services; co-chair, Retention Committee); Camille Wiersgalla, (past Co-Chair, Retention Committee); Elaine Pagliaro, (Co-Chair, Advising Committee); Kelley Talley, (present Co-Chair, Retention Committee); Marcia Mentkowski, (Chair, Research and Evaluation Committee, as well as Director, Office of Research and Evaluation)

envisioning and developing the inventory. For example, in 1994, the director of the Academic Advising Office, along with the course coordinators, assumed an active role by suggesting alternative response formats, revising item stems, and suggesting elimination of items. Each of these activities was then negotiated through meetings with research and evaluation staff. For example, suggested revisions of items were examined in relation to (1) the history of the development of the statements and their intended meaning, (2) the current research findings, and (3) the broad purposes of the inventory, including describing the domain of learning at Alverno College.

- academic advising office (Jane Frederick, Director)
- advising committee (Jane Frederick, co-chair; Celestine Schall)
- assessment council (faculty led, including research and evaluation representatives)
- career development center (Celestine Schall, Director)
- new student seminar course coordinator (Bernardin Deutsch)
- office of research and evaluation (including Glen Rogers, Tamar Ben-Ur)
- pre-professional seminar course coordinator (Debra Chomicka, present; Celestine Schall, past)
- retention committee (including Bernardin Deutsch, Glen Rogers)

Figure 2: Authors in relation to key positions and groups across the institution as they contributed to the development of the inventory across the last 10 years

REFRAMING VALIDITY AS RESEARCH AND INSTRUCTION ARE COMBINED

As we get to the heart of what we have to say, we return to the modest idea that completing the Student As Learner Inventory foremost had to remain a learning experience for the student,[6] even as we pursued our research and diagnostic score-based interpretations of the inventory. The first step we took was hardly even an extrapolation of this simple idea. In the first administration, we added a page for students to write a reflective statement about what they had learned about themselves as a learner by completing the invento y. This idea followed naturally from the principles undergirding the philosophy and practice of assessment-as-learning (see Alverno College Faculty, 1976, revised 1985, 1994).

By making student learning foremost in the administration and design of the inventory, we were led to reframe our thinking about validity. Reframing validity in this context of student learning meant thinking about more than just measurement (cf. Moss, 1994; Rogers, 1994). From a measurement perspective, validity involves the interpretation of a "score" (Messick, 1993). Often, the discussion of the validity of an inventory or test will assume *measurement* validity is the only meaning for the term validity. And, yet, our experience suggests that many contextual factors affect what is a valid interpretative process. Bringing a "score" into an interpretative process brings issues of measurement validity, but does not thereby exclude other interpretative processes with their own "validity" concerns.

We believe our experience in integrating individualzed instruction and aggregate research purposes has taught us something about creating scales and assessing their validity in an instructional context. While our practice has engaged some of the murky boundaries that surround the idea of validity, we largely confine ourselves to describing some examples of how we have concretely rethought what we were doing as we tried to maintain the standard that an inventory about learning should maximize learning as it is completed. Before we take up how our research and diagnostic uses of the inventory are beginning to be realized, we need to linger on how we first maximized its learning purposes.

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[6] The Consortium for the Improvement of Teaching, Learning, and Assessment (1992) also took "what did students learn by taking the assessment" as a common evaluative question in the development of student performance-based assessments across a variety of campuses

Putting Learning First in a Learning Inventory

Putting learning first in the inventory has meant that we have made some compromises that affect the psychometric properties of the inventory. In this section of the paper we explore some examples of how our thinking has been affected by putting learning first and then how we tried to integrate our research goals into our design of the learning inventory.

Inventory as Pedagogy

First, we have created a simplified response scale, which was a psychometric compromise. Psychometrically, we might prefer a response scale with a wide range of values in order to generate greater statistical variance. Pedagogically, however, we have strongly preferred a three value response scale, because a few distinctive response categories best supports a meaningful discussion of the response. We used the following scale, which facilitates discussions about personal stances toward learning (see Figure 3). For most items the distribution of responses is strongly skewed, for example less than ten percent answering "not characteristic."

Please indicate the degree to which the following is characteristic of your performance

1 Not characteristic
2 Partly characteristic
3 Characteristic

Figure 3: The Response Scale

Second, putting learning ahead of our research and measurement goals also affected how we presented the items on the inventory. Measurement theory generally works on the principle that separate items will be completed with independence. Otherwise they take on the undesirable measurement characteristic of "correlated error." Thus, psychometrically, we might prefer scattering related items. This is particularly important if we are interested in subscales, where method variance—owing to proximity on the inventory—might be confused with substantive correlations between items. Pedagogically, however, we prefer grouping related items. Such groupings enable the meaning of one item to spill over into the next, which is productive for a learner who is trying to develop an overall picture of how all of the learning principles and stances relate to one another[7]. We went even farther, however. Up until 1994, each group of items was preceded by commentary that related to students how faculty expect them to develop as learners. In effect, we were helping students see the "socially desirable" response to the items, as part of the teaching effort. We stopped doing this only because we developed an alternative strategy. We made this commentary about faculty expectations connect instead with the inventory's self-reflective statement. This self reflective statement is, of course, key to how the inventory becomes a summative learning experience.

[7] There may even be some psychometric ben[illegible]t from better communicating the meaning of the item

Including Research and Measurement Goals

The examples so far suggest how a pedagogical perspective modifies decision-making in the direction of communicating with the students. Accepting leadership from the pedagogical perspective of faculty does not mean that their pedagogy is not informed by the perspective of the researcher—or of measurement theory. This brings us to a third example of how our thinking was affected by putting learning first. Several faculty articulated the perspective that we should explicitly support beginning learners by acknowledging that their beginning learning perspective was indeed a legitimate one "at this time." As a result, we focused on developing a "beginning" student inventory that would both address the characteristics of "pre-thriving" learning and positively describe those early learning characteristics that students may show even just six to ten weeks into the curriculum.[8]

This meant that the most sophisticated learning statements—which were more characteristic of students who had developed through prolonged engagement with the curriculum (see Mentkowski & Doherty, 1984; Mentkowski, 1988)—would only be represented on separate inventories, if at all. Thus, our emergent plan was to develop several separate inventories—each inventory with its own version of items. Each would describe learning that was consistent with learners at a specific place in the curriculum.[9] We would try to support beginning students with positive statements about them as beginning learners. Of course, creating different inventories would mean that the inventory could not *measure* longitudinal change: For this reason, our research and measurement goals would suggest that common items, should be given to students at different places in the curriculum. If well designed, such items would be rated differently by students with different learning stances.

Over time, faculty have included in their articulation of a pedagogical stance, perspectives that are also compatible with these research and measurement goals. In this new view, faculty put equal emphasis on the value of presenting students with a view of how they might develop as learners. This new emphasis supports the measurement rationale for using a single inventory with common items for beginning and more established students in the curriculum[10]. At the same time, we have remained concerned to make sure that the items that describe the more sophisticated learning stances do not overburden the inventory with a vision of learning that beginning students would not understand.

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[8] Many students come to the institution with positive attitudes toward learning that enable them to quickly construct learning stances that are congruent with the curriculum's expectations.

[9] While "developing" and "advanced" student inventories *nominally* existed as item banks of learning statements, they were never administered as separate inventories.

[10] Indeed, the creation of a positive description of the beginning learner was developed by using many of the item-statements that faculty felt described the developing learner. Relatively few descriptions of a beginning learner could be construed as positive. In other words, if a student was a "beginner" on all statements, she was probably more what our faculty would call "pre-beginning." By including the developing statements on the pre-1991 "Beginning Student" version of the inventory, the instrument designers helped to show the student a better picture of where her development was expected to lead Finally, the tentative assignment of statements to a "beginning," "developing," or "advanced" status has not been tested by use of the inventory with students who are more established in the curriculum. The strategies initially used to assign statements to a theoretical level of student development as a learner on the campus are described by Rogers (1988).

A key to understanding our collaborative success in working across departments and roles is that each colleague is ready to take on a pedagogical or research perspective.[11] We are careful to not engender a "dichotomous debate" between research and pedagogical implications. And so, the modified pedagogical perspective should be understood as an evolving view: research and pedagogical implications are raised at key moments in a conversation and accommodated as seems prudent to our college's teaching mission.

In 1991, we revised the "beginning student" inventory to include statements about learning from more "developing" and "advanced" learners in the curriculum. When we made this change toward including more sophisticated descriptions of learning on the inventory, we agreed to expand the number of items on the inventory temporarily, to develop an empirical basis for item refinement. We also experimentally included an alternative item format, which was a forced choice between two statements about the characteristics of the student's learning. While we made these temporary research based decisions, which strained the attention of the beginning student and the available time for administration of the inventory, we did so only because these changes were deemed ultimately compatible with the expanded use of the inventory as a teaching and learning device. For example, the goal of having students reflect on changes in their learning would be facilitated by having them review their responses across time to the same items. Throughout the use and development of the inventory in the courses, we have remained focused on teaching and learning as the primary purpose for the inventory. In putting heavier demands on the student's attention, we strained—but were careful not to break—the effectiveness of the inventory as a device for students to reflect on their learning.

This brings us to a fourth example of how putting learning first has changed our thinking about the inventory. The teaching and learning goals have been sufficient to sustain use of the inventory. Thus, we could collect a great deal of preliminary data—without having to focus on effectively reporting data summaries. While the inventory has been used as an instructional device in New Student Seminar since 1986, we did not have a strategy for creating useful scoring procedures for the inventory until 1993. We did not report total scores nor subscale scores from the student self-ratings. Since 1986, we occasionally reported aggregate frequency data and we analyzed intercorrelations between items, and investigated possible differences in how minority students interpret the inventory.[12] Because we essentially had no advice on how to interpret the student self-ratings, when we routed the inventory to advisors, we put the self-reflective statement on top.

Even without a score construction strategy, our commitment to making the inventory an effective part of student reflection was sufficient to sustain its use by the New Student Seminar instructors. This success was foreshadowed by our 1986 analysis of student evaluations of the inventory as an aid to reflection on their learning. We asked students to describe the strengths and weakness of the inventory. The most typical strengths were comments such as "it helps me understand myself as a learner" and "it points out questions which the student should be asking themselves as they learn." While the most typical response was to find no

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[11] For example, research staff have helped write the stimuli for the student's reflective learning statement and faculty have consistently emphasized the need for longitudinal data on a single inventory.

[12] The frequency data has been the most useful of these in developing an understanding of student learning. A report in 1986 noted with some surprise that half of the students in New Student Seminar acknowledge some "emotional reaction to feedback that interferes with insight into her performance." An early Factor Analysis in 1987 of 30 items, with an *n* of 184, yielded three possible Factors, but they accounted for only 18% of the variance. In 1991, a faculty expert in culturally based learning differences reviewed the inventory for any cultural biases: Peter Murrell (personal communication, 1991) reported that the inventory did not appear to have any obvious cultural biases and, moreover, that the inventory's systematic focus on learning was a critical means for productively addressing potential learning and cultural differences.

weaknesses, some students did make observations like "some of the questions were vague to me" and "too many questions," both of which could be seen as valid complaints at that time. Thus, the sustained use of the inventory for eight years was based on the effectiveness of the inventory as a learning tool. We had some hopes for it as a research tool, but this latent promise of the inventory remained unrealized.

Integrating Research and Measurement with Instruction

While we were glad the inventory was meeting its first priority of promoting learning, we were concerned that instructors and advisors were reporting that the length of the inventory made it difficult for them to find a focus in their review of students' responses. As we addressed the question of how we might facilitate interpretation of the inventories, we were struck not only by the psychometric limitations of the self-ratings, but also by the difficulty of communicating tentative and developing understandings. Also, we confronted real logistical hurdles if we were to get the inventories scored and routed to instructors and advisors when they would be meeting with students.

Reframing Validity In An Educational Context

Ultimately, we built our strategy for facilitating interpretation of the self-ratings to be congruent with what our faculty and advisors were already doing in their use of the self-ratings. They were interpreting the student self-ratings in the context of other information about the students. The scoring and interpretation innovation we ultimately developed integrates teaching, advising, and research frameworks.

Focusing on Specific Responses

We realized we needed to facilitate an interpretation of student self-ratings so that they could be tied to the individualized analysis of the qualitative data on the inventory, as well as to the other data on the student that the instructor and advisor were integrating in their interpretative analysis (See Appendix B). This scoring interpretation needed to be made in the real-time of instruction and advising and needed to include our research-based understandings. The "real-time" interpretation strategy involved, in part, focusing attention on very specific responses. In the sample item below, only the first response is designated as potentially incongruent with successful academic integration. Thus, for *designated* "pre-thriving" items *one* specific "incongruent" value is **bolded** (see example below) on the carbon copies of the inventory that are used by the instructor and advisor (see Appendix A).

E.g., item stem: "I do more than asked for"

1. **"not characteristic of my performance"**
2. "partly characteristic of my performance"
3. "characteristic of my performance"

Through the "at a glance" **bolding** of responses, we support a real-time interpretive reading of the self-ratings, and a real-time intervention. A key to our success in enabling utilization of the inventory is that advisors and instructors do not need to wait for a report based on data entry. A bolded carbon copy of the completed inventory is immediately routed to the student's advisor, and one is available to the instructor as well. In addition, the hand "scoring" is so effortless, that it hardly even seems to be a "scoring" process.

By **bolding** selected response values, instructors and advisors notice potential "at risk" responses "at a glance." Without the bolding, the *reverse* scored items create perceptual barriers to distinguishing the "at risk" responses "at a glance." An additional perceptual barrier to reading the inventory, without the selected bolding, is that those "low" responses that are "typical" of *thriving* beginning student need to be distinguished from those that are "at risk" responses. For example, while we would like students to come to say "I enjoy exploring assessor responses in relation to my own analysis of my performance," a beginning student may not have enough experience with our system of assessment and learning to develop this confident attitude. Thus, their response, "not characteristic of my performance" might be little cause for immediate concern. Unpacking the implications of how we focus on specific infrequent responses illustrates how our instructional and aggregate research purposes are integrated within the educational context of the curriculum and how this integration has led us to reframe our approach to validity.

Context sensitive and real-time interpretation

- Faculty and advisors use such bolded responses in relation to the student self-reflection statement, and other knowledge of the student's performance, to discuss potential learning issues with the student
- Score "interpretation" in the context of a performance-based assessment system with feedback and self-assessment learning principles is a negotiated and provisional process

Conceptualizing the Pre-Thriving Construct

An explicit goal of New Student Seminar includes helping the students construct and continue to develop a viable perspective on their learning in the college and afterward. Thus, the inventory would be expected to "makes sense" to many students only as they are informed about and begin to experience the ability-based curriculum. The instrument addresses the degree to which the students are able to construct an initial image of themselves as self-directed learners that is congruent with fundamental principles that undergird the college's expectations for them as learners. There are intensive efforts to help students construct this congruent identity as learners, so the inventory really addresses a facilitated achievement of academic integration in a context where these educational principles have been articulated (Alverno College Faculty, 1976, revised 1985, 1992; 1976, revised 1985, 1994). In this context, the "at risk" response is conceptually defined as a rejection of a key principle that the student will need to embrace as a thriving member of a community of learners in a coherent curriculum.

Because the integration of beginning students into the academic milieu of the college generally proceeds along a well-supported path, only a few students show a tendency to reject the particulars of the Alverno philosophy of learning. This lack of statistical variance, of course, puts a strain on traditional strategies for developing a measure that is supported by item-level analysis. Appendix C shows the frequencies of these responses in the form of a handout used to inform instructors and advisors of the distribution of "at risk" (or "pre-thriving") responses on the 1991 version of the inventory. In the college we use the term "pre-thriving responses" to highlight—for those "at risk"—the potential to grow into thriving students. In Appendix C, the "pre-thriving" responses are sorted by frequency and by the direction of response scoring. The potential lack of integration into the curriculum is signaled, perhaps over-dramatically, by labeling potentially "pre-thriving" responses as "Not Me," or "That's Me," depending on the direction of the response that is scored as "at risk." The hand-out also specifies infrequent (but not rare) responses that are associated with student attrition at the level of the item. Overall, the handout is distinguished by the fact that it draws attention to the *rarest* and most *infrequent* responses students make. Most of the items have less than five percent of the students giving a "pre-thriving" response, and so no item level correlation is given for these.

Once we realized that the rare and infrequent rejection of a key Alverno learning principle could be summed across items, and committed ourselves to this theoretical stance, we then could develop a real-time interpretation strategy.[13] Our key insight was that the "rare" response could have an intrinsic theoretical meaning. In particular, we theorized that each individual student who was not integrating into the educational philosophy and principles of the college had a relatively different set of principles that they had difficulty accommodating. First, students might have specific "gaps" in their understanding of the college's learning principles. Second, even if they understood the learning principles, they might reject some. In particular, students with different world views might create different "defenses" for the traditional learning expectations they brought with them, such as the expectation for grades. Thus, fairly *infrequent* ways of rejecting or misunderstanding the educational perspective underlying the curriculum— as well as some more common learning issues—became theoretically important. The more non-normative the response, the more likely we might be identifying a unique way the student was constructing a maladaptive "rejection" of the expectations of the Alverno student as learner. However, if we were to pursue this theory, we had to give up on even the possibility of an empirically based item-level analysis of the "at-risk" scale we constructed. While developing a theoretical rationale for how to construct a scale is congruent with the highest form of psychometric judgment (cf. Loevinger & Wessler, 1970), the impracticality of an item-level empirical test of the scale construction did temporarily blind our research perspective to this kind of a solution.

> The effective integration of the aggregate research and instructional purposes meant embracing a conceptual scale construction framework

Statistically Validating the Pre-Thriving Scale

Although we could not statistically conduct *systematic* item analyses, we could test whether the number of "pre-thriving" (at risk) responses was related to retention. So, we tested this hypothesis before we asked instructors and advisors to try out the facilitated and real-time interpretation of the "at risk" responses.[14] But, as a test, we were not satisfied with just a test of whether the inventory predicted retention. After all, some students are admitted to college under "academic status" advisement based on their prior high school or college work. At the end of each semester, the college's Academic Status Committee reviews the performance of each student who had academic difficulties that semester or who was already under "academic status" advisement. In addition, the college has an extensive pre-college program and instructional services (Alverno College, 1993–94) that potentially can provide early information on students that may confront academic difficulties. So, we regressed retention[15] in sequence

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[13] A spur to making this theoretical analysis was the observation that for most items *"partly characteristic"* seemed to be a potentially sophisticated response. In particular, as students develop self-awareness about a learning issue, and see better the range of ways to develop a yet more articulated and consistent stance, they may be more likely to share a self-rating that reflects their understanding of limitations.

[14] Our analyses are based on data from 313 women who in the Fall of 1991 or 1992 completed the 1991 version of the *Student as Learner Inventory* in New Student Seminar. New Student Seminar is a course for all entering non-transfer students in the Weekday College time frame.

[15] For the purposes of these analyses, one-year retention is defined as a student completing their first two semesters. Technically, if the College's computer records indicated they had an attrition date code of April, which is near the end of the second semester, we assumed they completed that semester. Two year retention is correspondingly defined in April of the fourth semester. Retention information was missing for one individual.

first on to academic status[16] and then on to the number of "pre-thriving" responses on the inventory to test whether the number of "pre-thriving" responses predicted retention above and beyond first semester academic status. After the forced entry of academic status into the model, the number of "pre-thriving" responses still predicted one year retention, $b(1, 309) = -.24$, $p < .001$), and two year retention $b(1,309) = -.18$, $p < .01$).[17]

In 1993, faculty and staff representing diverse interests in the inventory reviewed these results and critiqued the educator's guide to the inventory developed around the "pre-thriving" item concept. While the above data justified our efforts to develop a facilitated interpretation of the "pre-thriving responses," the strategy of focusing on specific values of specific items does potentially overlook valuable information.

Benchmarking Against Alternative Scale Construction Strategies

To test how well our facilitated interpretation strategy utilized the retention relevant information in the self-ratings, we compared the "number of pre-thriving responses" index that we created with two alternative indices. One alternative, which we entitled the "conventional pre-thriving scale total," was comprised of the same item stems, but included all three scale points for each item, with a traditional summation across the items. The other alternative maximized not only the use of each scale point, but also maximized the number of items. To contrast with the 42 items that focused on basic expectations for beginning learners in the college, this alternative scale used all 82 items on the inventory.

Table 1 displays side by side the observed capacity of the three scales to predict one- and two-year retention. The three alternative scales from the Student As Learner Inventory show a relatively similar predictive relationship to student retention (see Table 1). The slightly reduced *n* for the "conventional pre-thriving scale total" relative to the index based on "number of pre-thriving responses" arises from differences in how we treated missing data. In particular, for the index based on the "number of pre-thriving responses," we have been able to make the simplifying assumption that a *missing* response can be assigned the value of *zero* (that is, not *pre-thriving)* since pre-thriving responses are rare or very infrequent.[18]

Table 2 displays side by side the observed capacity of the three scales to predict academic status at the end of two years in the curriculum. The three alternative scales from the Student as Learner Inventory have relatively similar predictive relationship to academic status two years later (see Table 2). Thus, we have evidence that the facilitated interpretation strategy is equally efficient in using the available data from the inventory. Although small, the correlations with retention and academic status displayed in Tables 1 and 2 provide some statistical evidence for the construct validity of the pre-thriving scale. Given the use of the inventory to intervene around learning issues, we cannot assume that higher predictive correlations should be expected. Also, of course, academic integration is only one of many factors in retention.

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[16] For the purposes of this and other analyses using academic status as a variable the following values were assigned: *Good standing = 0, special advisement = 2, probation = 4, probation with warning = 6,* and *academic dismissal = 8.* At entrance valid values are *0, 2,* and *6.* Cross-tabulation of the academic status scale with the inventory's "pre-thriving" scale corroborates the linear nature of the academic status scale, at entrance and at 2 years. (DC# SL00014)

[17] Data printout ID# (DC SL00017)

[18] The development of mean substitution scoring program for missing data on the conventional total scales is technically feasible, but we have not yet established it as a priority.

Contextual Features to the Valid Interpretation of Scores

Our strategy of facilitating an interpretation of self-ratings—in comparison to an isolated reported score—has another advantage, aside from being done in real-time. By placing the interpretation of the student rating next to the student's self-reflective statement on the inventory—as well as other qualitative data that instructors have at hand—and by placing the interpretation next to an opportunity to discuss it with the student, we have created a sensitive context that mitigates over-interpretation of the self-ratings. It should be noted that the *Standards for Educational and Psychological Testing* emphasize that individual items, are subject to considerable "error;" and in their interpretative use, advises a provisional interpretation that leads to further enquiry (American Educational Research Association, American Psychological Association, National Council on Measurement, 1985).

Table 1: *Correlations of Student as a Learner Inventory With One-Year and Two-Year retention By Scale Construction Strategy*

		r	
Scale Construction Strategy	***n***	**One-Year Retention**	**Two-Year Retention**
Entered In The Fall of 1991			
Number of Pre-Thriving Responses[a]	198	–.27***	–.29***
Conventionally Scored Sub-Scale[b]	173	.30***	.27***
Conventional Total Inventory Scale[c]	153	.26**	.25**
Entered In The Fall of 1992			
Number of Pre-Thriving Responses	114	–.24*	–.11
Conventionally Scored Sub-Scale	96	.28**	.18
Conventional Total Inventory Scale	91	.31**	.16

Note. The analysis is based on the 1991 version of the inventory.

[a] The "number of pre-thriving responses" is based on a response to a particular value of the scale, either *"not characteristic"* or *"characteristic"*. A higher number of pre-thriving responses indicates less integration into the curriculum learning expectations. This scale is based on 42 of the 82 inventory items.

[b] The "conventional scoring" of the pre-thriving scale is the simple total of the above mentioned 42-item scale. A higher score indicates a higher level of integration with the curriculum learning expectations.

[c] The "conventional inventory scale total" is the simple sum of the 82 inventory items. A higher score indicates higher integration[19]

In an ability-based curriculum that relies on performance assessments, faculty and advisors are accustomed to making judgments from qualitative data. In particular, instructors are experienced in making judgments of performance that are based on explicit performance criteria—where part of the assessment-as-learning process entails giving feedback to students on their performance on these criteria, as well as making an interpretation of

[19] Data printout ID# (DC# SL00011,SL00012)

the student's performance that is informed by the student's self-assessment (Alverno College Faculty, 1976, revised 1985, 1994). In this context, instructors and advisors are unlikely to use isolated scores from instruments and, instead, expect that their interpretations will be made in the context of a range of information about performance. Thus, there is very little pressure to over-interpret "scores" when a wealth of data sources and personal observations are available for students.

Table 2: *Correlations of Student as a Learner Inventory With Academic Status at the End of Second School Year By Scale Construction Strategy*

	Academic Status[d] at the End of 2nd Year	
Scale Construction Strategy	***n***	***r***
Entered In The Fall of 1991		
Number of Pre-Thriving Responses[a]	202	.31***
Conventional Pre-Thriving Scale Total[b]	176	–.31***
Conventional Inventory Scale Total[c]	156	–.27**
Entered In The Fall of 1992		
Number of Pre-Thriving Responses	115	.33***
Conventional Pre-Thriving Scale Total	96	–.36***
Conventional Total Scale	91	–.36***

Note. The analysis is based on the 1991 version of the inventory.

[a] The "number of pre-thriving responses" is based on a response to a particular value of the scale, either *"not characteristic"* or *"characteristic"*. A higher number of pre-thriving responses indicates less integration into the curriculum learning expectations. This scale is based on 42 of the 82 inventory items.

[b] The "conventional" scoring of the pre-thriving scale is the simple total of the above mentioned 42-item scale. A higher score indicates a higher level of integration with the curriculum learning expectations.

[c] The "conventional inventory scale total" is the simple sum of the 82 inventory items. A higher score indicates higher integration

[d] Academic status ranges from *0* (in *Good Standing*) to *8 (Academic Dismissal*)

DC# SL00011 SL00012

A key safeguard against over-interpretation of the inventory is that the student is brought into the interpretation process. Indeed, instructors and advisors use the self-ratings to support a conversation with the student, where the student provides her own perspective on her self-rating. For example, a student might simply explain that a particular response was a "mistake." The discussion of any implications for how the student's learning perspective is or is not conducive to learning in the curriculum is taken up as just another conversation, like any other, with her inventory responses as one source of grist to that conversation. Thus, the completed Student as Learner Inventory, is one of many sources of information that are included in the student's "Academic and Career Resource Journal," which she herself is responsible for maintaining. The primary use of this student portfolio is as a source of student self-reflection. The student copy does not have "pre-thriving" responses bolded, however, and the student does not see nor discuss "the number of pre-thriving responses." This helps avoid accidentally miscommunicating to the student that a "score" implies some kind of a label.

By having an advisor or instructor "score" student self-ratings in the context of other qualitative information and a student/advisor discussion we have changed the whole character of the interpretation. It has become provisional, negotiated, and contextualized (cf. Moss, 1994). As a result, the interpretation is something new. It is more than just one more notch up the "pre-thriving" scale. It is a particularized item, blended into a wider interpretative judgment process. In our best practice any interpretation is double checked against further discussions with the student as part of an attempt to help the student make meaning out of the curriculum.

Some Measurement Perspectives on Score Uses

Because we have, however provisionally, created "scores" with unknown reliability and many unknown measurement properties, we are committed to the continued investigation of these measurement properties and the continued contextualization of these scores in an interpretation process. Indeed, analysis of one-year retention for the Fall 1993 New Student Seminar cohort did not yield statistically significant correlations with the number of "pre-thriving" responses, $r\ (145) = -.03$. One possibility we have considered is that the interventions of instructors and advisors in relation to the inventory may have been so effective that they have made the relationship between pre-thriving responses and retention go away. The relationship between the number of "pre-thriving" responses and academic status did persist, $r(147) = .35, p < .001$.[20]

Because the inventory has maximized learning purposes over measurement properties, we intend to maintain the inventory as a diagnostic and research tool. We do not plan to use it for student placement or performance evaluation. Thus, we have considered measurement validity to be an important consideration in determining the appropriate use of the inventory, even as we reframe the meaning of validity in our instructional context.[21]

Items Specific to Local Context and Philosophy of Learning

As is clear from this analysis, some of the learning issues that are key to the diagnosis of congruence with the institution's expectations for the active learner are going to be specific or unique to the local context, in particular, to the agreed upon learning principles that are part of the college's ability-based curriculum.

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[20] A related issue is how the number of pre-thriving responses relates to factors, such as minority status, that are of particular concern when developing an inventory. The size of the sample only enabled comparisons between 48 African-American students and 229 Caucasian students. The number of pre-thriving responses was slightly related to African-American background in this sample, $r(277) = -.14, p < .05$. When the African-American students were included in a separate analysis, the relationship of the number of pre-thriving responses to retention was about the same, $r\ (48) = -.22, p > .11$. Although this correlation did not reach statistical significance, this could be attributed to the size of the sample. Our interpretation is that the inventory is equally effective in assessing integration into curriculum for students of different cultural backgrounds. Also (see page 10, footnote 12 above).

[21] As has been noted, the educators' guide (see Appendix B), significantly contextualizes the score interpretation process, which is contemporaneous with the students completion of the inventory. On an exploratory basis, we have also shared with the Advising Office and Course Coordinators a list of students who meet the cut-point number of "pre-thriving" responses. When using this report, we strive to maintain as many of the contextual characteristics of the real-time interpretations as possible. For example, when a list of students who potentially have "pre-thriving responses" in New Student Seminar is forwarded to the next instructor in Preprofessional Seminar, the report identifies the specific pre-thriving responses and is attached to a copy of the student's completed inventory. Advisors have to consult the copy of these responses that was routed to them previously. In this manner, they also recontextualize the listed responses in an overall interpretation of the inventory and its reflective statement

Many of the inventory's items (but not all) are specifically situated in the college's philosophy of learning. For example, Alverno's ability-based curriculum is supported by an articulation of how students develop self-assessment. The curriculum emphasizes the student's development of her self-assessment of abilities. She learns to self-assess what abilities she has demonstrated in performance relative to explicit criteria, which she internalizes (Loacker & Jensen, 1988). Thus, the following inventory item reflects a key learning concern in the ability-based curriculum.

— "I review my work, using criteria as a basis."

Another item addresses a learning issue that arises in a non-graded assessment system. Students are expected to demonstrate the Alverno abilities to explicit levels of performance. Feedback is in terms of what criteria are met and the level of performance in relation to these. Students do not receive grades nor explicit feedback on their performance relative to their peers. Instead, they are expected to take hold of their learning through a different kind of self-assessment comparison, trying to improve their performance over time relative to performance criteria (Alverno College Faculty, 1976, revised 1985, 1994). So, the following item represents a perspective, crucial to integration into the non-graded system, that faculty explicitly try to help students embrace:

— "I compare myself to myself rather than just myself to others."

Revision Based on Statistical Techniques and Informed Judgment

One key to the development of the inventory has been the decision to give instructors a key role in the revision of inventory items and the structure of the inventory in light of the course context. Their direct experience with the student population and with the use of the inventory gives them a critical perspective for evaluating the inventory. At the same time, analysis of longitudinal *Perspectives Interviews* (Mentkowski, 1988; Much & Mentkowski, 1984), statistical analysis of the relationship among items, and the concept of "pre-thriving" responses were key bases for making judgments about items.

The development of the real-time interpretation strategy and evidence of the relationship of "pre-thriving" responses to retention together sparked renewed interest in expanding the use of the inventory. This renewed interest helped create the context for significant involvement of the users in the revision of the inventory. Indeed, the coordinator of the Preprofessional Seminar[22] noted the need to streamline the inventory so that it could be feasibly administered in Preprofessional Seminar. As a result, an instrument revision team[23] over the summer of 1994 worked with researchers to revise the instrument and articulate its uses in this course context. The readministration in this second semester course has brought us closer to our long-term goal of collecting longitudinal data on the inventory as a natural outgrowth of its use in the curriculum.[24] The readministration has also brought us closer to the pedagogical goal of enabling students to reflect on changes in their perspective on learning.[25]

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[22] This second semester seminar is a developmental series of activities designed to focus students on the process of identifying career options in relation to their individual interests, values, and academic ambitions.

[23] This team included Debra Chomicka (Coordinator of Preprofessional Seminar), Jane Frederick (Director of the Academic Advising Office), and two members of the Office of Research and Evaluation (William Rickards and Glen Rogers). Bernardin Deutsch (Coordinator of New Student Seminar) also contributed.

[24] Next semester will be the first time the same inventory is administered in these sequential courses.

[25] We wonder whether one semester will be enough to reveal these changes. Ultimately, we hope to use the inventory at later points in the curriculum as well.

Figure 4 displays the range of considerations used by the revision team to reduce the number of item statements from 104 to 73. These include the statistical performance of the items in relation to each other and to retention, their qualitative contribution to a complete portrait of student learning, and other considerations—such as clarity—that connect to the instructors' and advisors' discussions with students around the items. The process of changing items from third person to first person, by itself, brought a new perspective to the quality of the item statements. Thus, the revised inventory and items were intended to meet the requirements of usability, breadth of coverage, faithfulness to the research-based meaning implied in the original item pool, and new learning about those meanings both from experience and research.

- Clarity of language for beginning student
- Helps communicate development as a learner in a specific and critical area
- Meaningful to beginning students
  - — more complex items paired with similar less complex items
  - — student and faculty perspectives on learning represented
- In context, projects a positive view of students
  - — "negative" items are retained only if used by students
- Might identify those most 'at risk" as learners
  - — conceptually designated as "pre-thriving" item
  - — item level correlation with retention (limited help)
- Has a meaningful loading in exploratory factor analysis

Figure 4: Criteria for retaining or rewriting items

Perhaps one of the most conceptually challenging measurement concerns was consideration of the structure of the inventory. On the one hand, we wanted to keep items based on their use in the "pre-thriving" scale and its conceptual scale construction strategy. This strategy assumes they cohere as one "pre-thriving" construct. On the other hand, we wanted to simultaneously pursue alternative scale construction strategies that might reveal some subscales within this domain of integrating into the curriculum. To this end, we conducted a factor analysis of the 1991 version of the inventory. This analysis used the full set of three response values. Although this analysis hinted at some structure in the inventory, it did not yield particularly clean factors, which was not surprising, given the limited variance in the response scale[26]. Nonetheless, we used this factor analysis as one frame for selecting items to keep. This strategy both held open the possibility of identifying different kinds of learning issues in subscales and ensured that the inventory would include a multifaceted coverage of the student constructions of the curriculum's learning principles[27].

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[26] The Principle components factor analysis (n=460) was conducted iteratively. Items with low "commonality" were excluded, leaving 52 of the 82 items on the 1991 inventory in the analysis. The resulting five factor solution accounted for 27 percent of the variance. Of the 52 items, 40 had a loading of at least .30—with all off-diagonal loadings smaller by at least .10. This was used as a cut-off for selecting items that would be of interest for a factor approach to inventory development. Of these 40 items, however, only 15 did not have an off-diagonal loading of .20 or more for one of the other factors.

[27] In order, the five factors were (1) Conceptual Involvement in Learning (e.g., doing more than expected, affirms relation between theory and practice), (2) Career-Oriented Learning (e.g., relates career goals to educational experience), (3) Ability-Based Learning (e.g., use of feedback), (4) Directed Learning (e.g., following directions), and (5) Commitment to Academic Work (e.g., shows concern about personal life that keep her from achieving). The number of items targeted from each factor as having a factor-based interest for inclusion in the revised inventory were, respectively, 13, 9, 7, 7, and 4. Because this was a secondary criterion for consideration, only roughly eighty percent of these items were kept for the 1994 version of the inventory

SUMMARY AND CONCLUSION

Because the inventory is embedded in a coherent curriculum with a distinctive learning philosophy, we do not expect the inventory itself to be transportable to another institution. In fact, we believe the development of the inventory for a specific context is the basis for its strength and this is something we advocate. Nonetheless, we do believe that our experience in integrating research and instructional purposes in the inventory may be of interest to others. The principles that undergird the inventory are also of common concern. While our research achievements with the inventory are modest so far, we have made some conceptual breakthroughs that give us great expectations. We present one overarching lesson. Our efforts toward prioritizing student learning from the inventory—even as we developed and fielded it—has put us in the position for simultaneously achieving our research, teaching, and advising goals. Putting learning first meant using a response scale with a few distinct alternatives, organizing items pedagogically, including a self-reflective essay, embedding the inventory in an opportunity for a discussion about learning, and creating items that positively communicate student constructions on learning. The inventory is an integral part of instruction, not an externally administered instrument.

Because we have had to look for opportunities that meet our latent research and scale construction goals, we have developed a different kind of strategy for constructing scale scores and for facilitating interpretation of the student self-ratings. In 1993, we developed a scale and a real time strategy for instructors and advisors to identify students with "pre-thriving learning stances." The "pre-thriving" scale identifies responses that are unusual and that suggest intervention. For example, a student indicating that she does not "try out new skills in new situations" can be approached about her reasons for this response. Thus, teachers and advisors are encouraged to use the student endorsement of specific item responses to foster a unique dialogue with students. By focusing on infrequent responses, the scale construction of the inventory is based on a congruent principle that individuals may have relatively unique difficulties. For example, moving into a non-graded curriculum means most students have to construct new learning stances, and students with difficulty in integrating into the curriculum may have constructed relatively unique "holes" in their understandings that prevent them from thriving as learners.

Our scale construction strategy has been conceptually based. Extensive research and faculty experience has provided a basis for identifying a wide range of learning issues and student perspectives where "pre-thriving" learning stances might develop. A corresponding key role of the inventory is covering a broad range of potential learning issues. For example, instructors and advisors report a prior awareness of many of the issues that become apparent in student responses on the inventory, but also note that new issues emerge.

The integration of "pre-thriving scores" into the instructors and advisors ongoing interpretative processes has led us to reframe our validity concerns. Our interpretative practice is informed by both learning and measurement perspectives on validity. The integration of the inventory into a teaching and learning process contextualizes ongoing interpretations. Focusing on specific responses helped us integrate teaching, learning, advising, and research purposes.

Aggregate findings help inform the use of the inventory by the teachers and help validate the construction of an overall scale score. "At risk" responses have been correlated with student academic status in the first two semesters. The correlations with one and two-year retention have been less consistent across these years, but are in the expected direction. The psychometric "limitations" of the inventory—for example 37 percent of students had no "pre-thriving" responses and only 18 percent had four or more such responses—are counterbalanced by the effectiveness of the integration of the inventory into the teaching and learning process.

Collaboration among individuals filling diverse roles and departments across the institution has been key to the development and effectiveness of the inventory. Key among these has been the ongoing discussions among instructors, advisors, and researchers. Collaboration is a result of common commitments to developing students as learners and of the hard work of communicating understandings. This has meant arranging opportunities to discuss issues—with individuals from each role taking on both teaching and research issues as part of their responsibility. One crucial step in this process has been the development of the "Educator's Guide to the Student As Learner Inventory," which provides not only the "scoring" and interpretation advice, but also describes the context of the administration and other possible uses (see Appendix B).

The integration of teaching, learning, advising, and research purposes means that students benefit directly and indirectly from completing the inventory. They benefit directly by learning about what it means to integrate into the curriculum. In New Student Seminar, completing the inventory is an integral part of the course's summative experience. Students learn about key educational principles and are apprised of how they are beginning to integrate into the curriculum. The inventory provides students the opportunity to share a range of their views on learning. This includes a crucial self-reflective statement by students. Thus, teachers are able to bring them into a conversation about their learning perspective in relation to what will make them effective as learners in the curriculum. The inventory not only helps teachers and advisors identify students who have learning issues that put them at risk, but it also helps them construct a timely intervention. The inventory does more than predict students who may be at risk of leaving the institution, it helps do something about it. Finally students indirectly benefit. The inventory supports the college's research into the development of students as learners in the curriculum. The longitudinal administration of the inventory simultaneously supports the student's own self-reflection on her development as a learner in the curriculum. She has another opportunity to take hold of her learning. This is one of the highest goals we have as educators.

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APPENDICES

APPENDIX A — STUDENT AS LEARNER INVENTORY

Student as Learner Inventory

ALVERNO COLLEGE
Milwaukee, Wisconsin

Learning at Alverno may be different from other experiences you have had. By completing this inventory, you have an opportunity to broadly reflect on your development as a learner. The last page of the inventory invites you to write a reflective statement about your approach to learning.

Instructions for Completing the Inventory

Most of the pages of this inventory consist of different statements regarding the behaviors which students display as they develop as learners. All statements are legitimate descriptions of students at various points of development. Read each statement, and then indicate the degree to which it is characteristic of your *current* performance as a learner. Please, indicate your judgments by **circling** one number, as shown in the example below.

Example:

	Circle One		
	Not Characteristic	Partly Characteristic	Characteristic
40. I actively build on strengths.....	1	(2)	3

Note: Something may be "characteristic of your performance" either because you usually do it or because it describes your thinking or feeling as you perform. Sometimes you may want to distinguish between these "characteristics of your performance" and "who you are as a person."

STUDENT'S NAME (Please Print)		ADVISOR'S NAME
STUDENT ID NUMBER	DATE	CLASS

COLLEGE WORK AND INDEPENDENT LEARNING

Committing to College Work

At this time, do the following characterize (describe) my performance?

	Circle One: Not Characteristic	Partly Characteristic	Characteristic
1. I follow concrete suggestions, explanations, and directions in my learning process	1	2	3
2. I do more than expected	1	2	3
3. I attend class regularly	1	2	3
4. I am enthusiastic about my coursework	1	2	3
5. I respond to situations in which I am personally asked to participate	1	2	3
6. I do more than asked for	1	2	3
7. My concerns about my personal life keep me from achieving in my academic work	1	2	3
8. I complete assignments on time	1	2	3
9. I participate in class activity.	1	2	3
10. I set goals and work towards them	1	2	3

Becoming Independent in Learning

Do the following characterize (describe) how I am learning this semester?

11. I accept personal responsibility for learning when asked to	1	2	3
12. I see the teacher as an organizer of learning opportunities	1	2	3
13. I try a new approach to learning or problem solving when it has been demonstrated	1	2	3
14. I select an appropriate framework for analyzing a work (something someone created), even when I'm not given a framework	1	2	3
15. I ask questions, even though there may be some risk involved	1	2	3
16. I pursue answers on my own before asking questions	1	2	3
17. I develop my own learning goals, plan for them, and achieve them on my own initiative	1	2	3
18. I feel as though I am controlled by external factors that I cannot myself control	1	2	3
19. I create my own criteria in addition to those provided by instructors	1	2	3
20. I express my own perspective in thinking and communicating with others (do not simply disagree or agree with others)	1	2	3
21. I extend my learning beyond the requirements and expectation of my courses	1	2	3

Self-Assessment

How do I characterize (describe) my self-assessment this semester?

	Not Characteristic	Partly Characteristic	Characteristic
	Circle One		
22. I analyze how my behaviors affect group interaction	1	2	3
23. I recognize that my attitudes affect my work	1	2	3
24. I review my work, using criteria as a basis	1	2	3
25. I assess weaknesses in my own thought with the same thoroughness that I apply in the assessment of others	1	2	3
26. I can identify my own strengths and weaknesses	1	2	3

Using Feedback and Assessment Criteria

How characteristic are the following of my learning?

27. I compare myself to myself rather than just myself to others	1	2	3
28. My emotional response to feedback interferes with my analysis of my performance	1	2	3
29. I enjoy exploring assessor judgments in relation to my own analysis of my performance	1	2	3
30. I believe assessor judgments are arbitrary and vague, giving little meaning for being validated	1	2	3
31. I see criteria as a framework for learning that enables me to transfer my learning to new situations	1	2	3
32. I want criteria to be a standard for how close I am to learning enough of the right answers	1	2	3
33. I experience criteria as a picture of the ability I am learning or performing	1	2	3
34. I know when to treat criteria as flexible and open to interpretation	1	2	3
35. I enjoy reflecting on how one performance of mine demonstrates something I've noticed in another performance as well	1	2	3
36. I experience feedback as affirming or rejecting who I am rather than what I do	1	2	3
37. I accept criticisms and suggestions and follow through	1	2	3

Commitment to Improve Abilities

Are the following now characteristic of my performance?

	Not Characteristic	Partly Characteristic	Characteristic
	Circle One		
38. I try hard to improve my assessment performances	1	2	3
39. I seek help from others in my academic development	1	2	3
40. I actively build on strengths	1	2	3
41. I complete assignments that at first I do not think I can do	1	2	3
42. I focus on using and developing my time management skills as a student	1	2	3

Understanding Alverno's Integrated Learning Process

How characteristic are the following of my learning experiences?

43. I need faculty to give specific examples of how various abilities relate to each other	1	2	3
44. I recognize that I can consider modifying assigned procedures or directions	1	2	3
45. I see that the same ability is used across my different courses	1	2	3
46. I incorporate a number of abilities in approaching a problem.	1	2	3
47. I see abilities as tools that will be used in school, personal life, and career	1	2	3

PERSONAL DEVELOPMENT

Developing One's Own Perspective and Being Creative

How descriptive are the following of my performance this semester?

	Circle One: Not Characteristic	Partly Characteristic	Characteristic
48. I express my own ideas in my work	**1**	2	3
49. I apply my own style to my work	**1**	2	3
50. I create strategies to strengthen my learning experiences	1	2	3
51. I use alternative learning strategies to achieve my academic goals	1	2	3
52. I expect to use my preferred learning style in all learning situations.	1	2	3

Applying Concepts

How characteristic are the following of my learning?

53. I attempt to apply my learning outside the classroom	**1**	2	3
54. I believe learning is a process, i.e., that one learns how to learn	1	2	3
55. I respond to and affirm relationships between theory and practice	1	2	3
56. I try out new skills	**1**	2	3
57. I need to have relationships between my everyday experiences and what I am learning pointed out to me	1	2	**3**
58. I apply a newly learned ability outside of school	**1**	2	3

Taking Multiple Viewpoints

How characteristic are the following of my thought and action this semester?

59. I relate ideas, issues, from one course to another	**1**	2	3
60. I connect ideas from coursework to other life experiences	1	2	3
61. I expect faculty to tell me what is the best perspective.	1	2	3
62. I consider the positive implications of viewpoints that I do not prefer	1	2	3
63. I listen to the viewpoints of others.	**1**	2	3
64. I combine my own ideas, and those of others, with those supplied by my course, to create new relationships.	1	2	3

Committing to Professional Goals

How characteristic are the following of my thought and action?

	Circle One: Not Characteristic	Partly Characteristic	Characteristic
65. I relate my current educational experiences to my career goals	1	2	3
66. I continue to explore a variety of career options	1	2	3
67. I set new goals for my professional life	1	2	3
68. I have developed professional goals	1	2	3
69. I pursue career development despite responsibilities, obstacles or sacrifices	1	2	3
70. I analyze the relationship between my own abilities and my personal career goals	1	2	3
71. I reflect on the broad relationships the instructor makes between what I am learning and what I will be doing after college	1	2	3
72. I apply what I am learning to my professional development	1	2	3
73. I seek career information from knowledgeable sources outside the classroom	1	2	3

You have completed this portion of the inventory! The next page gives you an opportunity to reflect on your approach to learning.

Inventory Sections and Reflection Topics

1. *Committing to College Work:* Alverno instructors expect that Alverno students will be committing themselves to college work. Describe what keeps you committed to college work?

2. *Becoming Independent in Learning:* As they learn, students become more independent in their learning. Describe a performance where you learned something because of a question you asked yourself.

3. *Self-assessment:* One way a student becomes more independent in learning is by developing the ability to self-assess or to judge her own performance. Describe what self-assessment means to you.

4. *Using Feedback and Assessment Criteria:* Another way a student becomes more independent in learning is by developing the ability to use feedback and assessment criteria. When a student learns how to fully explore assessment criteria, it enables her to improve her use of feedback and to judge her performance more productively. Describe a time when you used feedback from one performance to improve another one.

5. *Commitment to Improve Abilities:* A commitment to improving helps students to learn to self-assess and to use feedback. Feedback is for where the student is going—forward. Describe an ability you need to improve and why you want to improve it.

6. *Understanding Alverno's Integrated Learning Process:* Alverno instructors believe that a student will be learning to "put it all together" (i.e., integrate everything) as she learns more about ability-based learning. Describe a time when it all "came together" for you, and what insight you had.

7. *Developing One's Own Perspective and Being Creative:* Alverno instructors expect that you will be developing your own unique perspective. Ability-based learning helps you to become an expert in your field and to work creatively. Describe what makes you most creative.

8. *Applying Concepts:* Alverno instructors believe a student will apply the understanding she is developing to her work and personal life. Describe how you applied something you learned to another situation.

9. *Taking Multiple Viewpoints:* Alverno instructors expect that a student will learn to use more than one perspective in her field and that she will learn more about why multiple perspectives exist. Describe an opinion you disagree with and then (without endorsing it completely) describe something good about this alternative opinion.

10. *Committing to Professional Goals:* Alverno instructors believe that students continue to develop new and deepened understandings about professional careers and professional values. Students learn more about professional careers and more about how different and specific careers could relate to their emerging interests, values, and abilities. As a result, students find that future paid employment becomes meaningful in new ways. What does a "professional career" mean to you now? What have you learned about a particular profession that makes it a meaningful alternative or choice for you?

Guidelines for writing a reflective statement about your learning

NSS

Name _____ Date _____

On the accompanying handout, you will find descriptions of various sections of this Inventory. Choose **one** section topic that you want to give special thought to. Write a reflective paragraph or two on that topic. Write your reflections in the form of a letter to a friend with whom you would like to share your thoughts and feelings about learning.

(add a sheet of paper if you like)

ALVERNO COLLEGE
Milwaukee, WI
Office of Research and Evaluation

APPENDIX B — EDUCATOR'S GUIDE TO THE *STUDENT AS LEARNER INVENTORY*

Context of Administration and Use in Semester 1 and 2

The *Student as Learner Inventory* is administered in New Student Seminar and again in Pre-Professional Seminar. Instructors in these courses use the inventories as part of a guided self reflection on learning and careering at Alverno. A copy of the inventory is routed immediately to Advisors, so that it is available for a potential conversation during registration that semester. The student retains a copy in her Academic and Career Resource Journal. The inventory has two distinct kinds of uses: (1) identifying students who may have learning difficulties at Alverno and supporting a conversation with students about these and (2) supporting student self-reflection on their learning, both by students completing the inventory and by educators validating and extending student self reflection.

Identifying Items That Suggest Learning Difficulties at Alverno

Generally, first-year student responses indicate a self assessment of behavior or learning perspective that Alverno educators would affirm as consistent with being a beginning or developing learner at Alverno. Some student self-reports, however, seem to suggest learning issues that are "pre-beginning" or "pre-thriving." For example, they may acknowledge a passive learning stance or that Alverno's educational principles are "not me." While such self-assessments are infrequent, when they occur they suggest that the first-year student may be "ready " to explore the learning issue with an Alverno educator, so that she can better integrate with the learning environment. To this purpose, the carbon copy of the Student as Learner Inventory indicates the potentially "pre-thriving" responses:

- Using the carbon copy of the inventory, review the student's self-assessment choices that are in **bold**.

Some items have a "pre-thriving self-assessment" response identified. The "pre-thriving" response is either "**1**" or "**3**" and is in **bold.** Usually, it is the "Not Characteristic" response that is bolded, i.e., the "**1**," response.[28] The more "pre-thriving" responses, the more likely the student may be "at risk" as a learner at Alverno.

- Check and count the number of responses indicating a "pre-thriving" self-assessment of herself. Write the total on top of the carbon copy.

To what degree is she sharing a self-assessment that is most similar to the beginning learner at Alverno who is not yet thriving? If you find that she has *four* or more "pre-thriving" responses, she may be suggesting that she is having considerable difficulty connecting to the Alverno learning style and may need a supportive opportuni · to "rethink" what it means to become an effective learner at Alverno. "Pre-thriving" responses nave been linked to a greater risk of dropping out of Alverno within two years, so specifically intervening around the content of the response may be one targeted way to improve student retention and eventual success.

[28] For questions 18, 28, 30, 36, and 57, it is the "Characteristic" response, "**3**", that is bolded

Giving Inventory Feedback to Students

Feed Forward For Students With Pre-Thriving Responses to Items: A strength of the inventory is that it enables students to provide a self-report on a broad range of learning perspectives. Ideally, any "pre-thriving" self-assessment should be a topic for discussion with the student. Of course, the discussion would focus on the student's learning issue and her perspective on how she is effective in the Alverno context and would avoid unnecessary characterization of the student response. After you have explored the thinking behind each of the student's pre-thriving responses, and have found that they represent genuine issue(s) for the student, you might explore with the student a learning plan (e.g., suggest a future conversation) in relation to the self-identified area of concern.

Feedback on Learning About Self-As-Learner Essay. Only about one-third of the beginning students will give even one "pre-thriving" item-response. The reflective statement that students complete at the end of the *Student As Learner Inventory* provides the most consistent data for exploring student insights into their own learning. A conversation with the student about her self-reflective statement might validate the student for her current insight, as well as to support her further articulation of herself as a learner.

Postscript on Later Use By Faculty Advisors or Other Instructors

The greater the time between the student completing the inventory and then speaking to someone about it, the less likely it will be a meaningful conversation. Likewise, the student may have changed her perspective.[29] A faculty advisor—who sees this inventory outside of its classroom context—might prefer to raise the learning topic without making an explicit reference to the student's prior response, especially if more than a semester has passed. However, in the context of other observations of the student, a faculty advisor might judge that the student's "pre-thriving" responses made much earlier in her career still suggest some directions for further exploration with the student on her perspective on learning at Alverno.

We encourage faculty to experiment with uses, including further guided student self-reflection, perhaps through self-reflection on changes in her responses.[30] From this perspective, a conversation later in the student's career might validate or reinforce her growth as a learner.

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[29] If faculty would like to readminister the instrument to support a conversation with a student or for another purpose, they may request copies of the inventory from the Office of Research and Evaluation. We are interested in learning from your experience, as well as in providing support where we may. Contact Glen Rogers (6269) or Bill Rickards (6256) in the Office of Research and Evaluation.

[30] The "pre-thriving responses" are not identified on the student copy, so as not to influence her initial response..

Appendix C — Frequency of Pre-Thriving Responses[31] on Student As Learner Inventory Items Sorted by Frequency and Direction of Response

"NOT ME"

Rare Student Responses: "That's Not (at all) Characteristic of Me"

Item #	*Statement*	*Percent "Not Me"*
5.	Responds to situations in which she is personally asked to participate	0.0%
9.	Accepts personal responsibility for learning when asked to	0.0%
26.	Knows she should improve; wants to improve; tries hard to improve in quality way	0.0%
34.	Explores assessor's judgments in relation to her own performance	0.0%
12.	Follows specific directions in assignments	0.5%
52.	Relates ideas, issues, from one area to another	0.5%
60.	Applies what she is learning to personal and professional life.	0.5%
3.	Attends class regularly	1.0%
33.	Sees criteria as one part of a process for learning and assessment	1.0%
42.	Expresses her own ideas in her work	1.0%
14.	Selects an appropriate framework for analyzing a work	1.1%
19.	Reviews her work, using criteria as a basis	1.1%
43.	Applies her own style to work	1.6%
57.	Thinks about relationship between her own abilities and personal aspirations	1.6%
4.	Shows enthusiasm for coursework	2.1%
25.	Completes assignments in weak areas; aware of weaknesses	2.1%
45.	Attempts to apply her learning outside the classroom	2.1%
30.	Sees criteria as framework for learning that enables her to transfer learning	2.6%
37.	Sees that the same ability is used across her different courses	2.6%
59.	"Hears" when the instructor makes broad relationships between what students are learning and what they will be doing after college	2.6%
13.	Tries a new approach to learning or problem solving when it has been demonstrated	3.1%
50.	Applies a newly learned ability outside of school	3.1%
56.	Pursues education/career development despite outside responsibilities, obstacles or sacrifices	3.1%
38.	Spontaneously incorporates a number of skills in approaching a problem	3.6%
48.	Tries out new skills in situations	3.6%
10.	Sees teacher as an organizer of learning opportunities	4.3%

[31] Pre-thriving (or pre-beginning) responses are inferred based on the divergence of the student's response from one that would reflect integration into the Alverno learning environment.

"NOT ME" continued

Infrequent Student Responses: "That's not (at all) characteristic of me"

Item	*Statement*	*Percent "Not Me"*
20.	**Examines weaknesses in her own thought with the same rigor that she applies in the critique of others**	5.3% *
40.	Extends her learning beyond the requirements and expectations of her major	6.3%
16.	Pursues answers on her own before asking questions	6.8%
29.	Sees criteria as feedback on strengths and weaknesses	7.3%
15.	Asks questions, even though there may be some risk involved	7.9%
21.	**Compares self to self, rather than just self to others**	8.3% *
6.	**Does more than asked for**	11.5% *
2.	Does more than expected	13.0%

"THAT'S ME"

Rare Student Responses: "That's (really) Characteristic of Me" Responses

Item	*Statement*	*Percent "That's Me"*
31.	Sees assessor's judgments as arbitrary and vague, with little meaning for being validated	1.0%
P.1.	Sees the learning of the abilities as additional work that takes away from her being given the course content.	3.6%
I.2.	Experiences feedback as affirming or rejecting who she is, rather than what she does.	4.7%

Infrequent Student Responses: "That's (really) Characteristic of Me" Responses

D.2.	Places responsibility for learning on the teacher rather than herself.	5.8%
M.2.	**Sees assessor's judgments as personal opinions.**	9.4% *
18.	Feels as though she is controlled by external factors that she cannot herself control	9.9%
23.	Shows emotional response to feedback that interferes with insight into her performance	12.0%
49.	Needs to have relationships between her everyday experiences and what she is learning in her chosen field pointed out to her	14.1%

Note: Based on students in New Student Seminar in the fall of 1991. (N = 192)

* Correlations conducted on infrequent pre-thriving items showed responses to these items to be associated with not being on campus two years later.